**PRODUCT CLASSIFICATION LIST**

All products are normally classified based on standard Sales Manual description of purpose. I/O or terminal products exclusive to one division which attach to selected products of the other division through RPO’s are considered Common (for those uses only).

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(*) Certain models of these machine types have not been withdrawn from marketing.

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PRODUCT CLASSIFICATION LIST

All products are normally classified based on standard Sales Manual description of purpose. I/O or terminal products exclusive to one division which attach to selected products of the other division through RPQ's are considered Common (for those uses only). Models 7XXX machines are not shown. Machine types indicated by an (*) have certain models which have not been withdrawn from marketing. Refer to applicable machine page for models that have been withdrawn from marketing.

MACHINES WHICH ARE WITHDRAWN FROM MARKETING

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(*) Certain models of these machine types have not been withdrawn from marketing.
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<td>Reprinter</td>
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<tr>
<td>Interpreting Reproducing Punch</td>
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<td>Duplicating Summary Punch</td>
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<td>Reprinter</td>
<td>Typewriter Tape Punch</td>
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<td>Computing Punch</td>
<td>Comparing Bill Feed</td>
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<td>Computing Punch</td>
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<td>Computing Punch</td>
<td>Bill Feed</td>
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<tr>
<td>Computing Punch</td>
<td>Carriage</td>
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<tr>
<td>Computing Punch</td>
<td>Carbon Ribbon Feed</td>
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<td>Interpreter</td>
<td>Electronic Storage Unit</td>
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<td>Interpreter</td>
<td>Multiline Posting Machine</td>
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<td>Interpreter</td>
<td>Auxiliary Printing Tape Punch</td>
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<td>Code Comparing Unit</td>
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<td>Multiplier</td>
<td>Memory Unit</td>
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<td>Electronic Multiplier</td>
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<td>Calculator</td>
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<td>Auxiliary Processing Unit</td>
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<td>Output Control Unit</td>
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<td>Paper Tape Punch for 632 System</td>
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<td>Remote Printing Station</td>
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<td>Space Plotter</td>
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<td>Self Check Numbering Unit</td>
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<td>Central Processing Unit (702 System)</td>
<td>Teletype to Card</td>
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1922-2 Tape Adapter (RPO)
1922-4 Tape Adapter (RPO)
1922-19 Tape Adapter (RPO)
1924-12 Control Unit (RPO)
1924-38 Punch Control
1924-44 Buffer Punch
1924-63 Printer Control Unit
1924-66 Control Unit (RPO)
1924-97 Control Unit (RPO)
1927-1 Inquiry Station (RPO)
1933-2 Reader Punch
1933-9 Serial Card Reader
1940-7 Serial Printer (RPO)
1944-5 Card Transceiver - 5 Channel
1946-6 Terminal Control Unit
1946-9 Reader Mark Sense (RPO)
1945-3 Magnetic Tape Transfer Unit
1946-4 Card Terminal (RPO)
1973-1 Card Read Punch (RPO)
1974-2 Tape Transmission Processor
1974-4 Sequence Keyboard (RPO)
1979-8 SMS Cube
1996-13 Storage Power Control Unit
1996-14 Drum Power Converter
1996-15 Drum Control Unit
1996-16 D.C. C.E. Console
1996-17 Drum
1996-18 Drum Air Compressor
1996-19 Drum Air Receiver
1996-24 Impulse Readout Master Clock (RPO)
1996-28 Clock
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2976-3 Transmission Control Unit
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7105 Central Processing Unit (7072 System)
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7256-1 Photo Store Unit
7262 Console
7266-1 Lexical Processor
7275-2 Toll Rating Interface
7286-3 Channel Direct Data
7286-5 Channel Direct Data & LCM
7293 Power Supply & Power Control
7294-1 Tape Independent Power
7300 Disk Storage
7404 Graphic Output Unit
7503 Card Reader
7553 Card Punch
7605 Disk Storage Control
7612 Disk Synchronizer & Storage
7613 Tape Control
7614 Card Reader Control
7615 Card Punch Control
7616 Printer Control
7619 Exchange
7620 Channel
7622 Signal Control
7623 Console Central
7634 Graphic Control Unit
7701 Tape Transmission Terminal
7710 Data Communication Unit
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7956 Stretch
7957 Stretch
7958 Stretch
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<td>541 Card Read Punch</td>
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<td>780 CRT Display</td>
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<td>728 Magnetic Tape Unit</td>
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<td>1414 Input/Output Synchronizer</td>
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<td>1415 Console</td>
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<td>7104 High Speed Processor (7074 System)</td>
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<td>1301-11 Disk Storage Unit</td>
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<td>7108 Instruction Processing Unit (7090 System)</td>
<td>1301-21 Disk Storage Unit</td>
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<td>7111 Instruction Processing Unit (7094-II System)</td>
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<td>7114 Processing Unit (7010 System)</td>
<td>1401 Processing Unit</td>
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<td>1402 Hypertape</td>
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<td>1403-1 Printer</td>
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<td>7301 Core Storage</td>
<td>1406 Storage Unit</td>
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<td>7302 Core Storage</td>
<td>1407 Console</td>
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<td>7305 Central Storage &amp; Input/Output Control</td>
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<td>7320 Drum Storage</td>
<td>1421 Bank Transit Machine</td>
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<td>7500 Card Reader</td>
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<td>7501 Console Card Reader</td>
<td>1442-2 Card Reader Punch</td>
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<td>7502 Console Card Reader</td>
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<td>7804 Power Unit</td>
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<td>1924-77 Control Unit</td>
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<td>1925-22 Switch</td>
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<td>7702 Magnetic Tape Transmission Terminal</td>
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<td>2712 Remote Multiplexer</td>
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DP Machines

PLANNED DATES FOR DISCONTINUANCE OF LEASE AND RENTAL MACHINE TYPES/MODELS AND WITHDRAWAL OF IBM MAINTENANCE AGREEMENT SERVICE

7473-2  RPQ Display Terminal
7772  Audio Response Unit

April 30, 1982
812  Automatic Production Recorder
813  Portable Keyboard
814  Remote Control Unit
815  Automatic Typewriter
816  Remote Automatic Typewriter
817  Card Reader
818  Remote Shaft Position Converter
819  Printing Card Punch
820  Time Punch
821  Data Acquisition Control
822  Card Reader
823  Remote Control
824  Sampler Reader
1210  Reader Sorter
1259  Reader Sorter
1412  Magnetic Character Reader

June 30, 1982
2321  Data Cell Drive

February 28, 1983
50  Magnetic Data Inscriber
108  Card Proving Machine
602  Calculating Punch
614  Typewriter for 632 and 634 Systems
630  Calculating Unit for 632 System
631  Calculating Unit for 632 System
634  Calculating Unit for 632 System
635  Calculating Unit for 632 System
636  Calculating Unit for 632 and 633 Systems
637  Calculating Unit for 632 and 633 Systems
638  Calculating Unit for 632 System
641  Card Reader for 632 System
645  Card Reader for 632 System
824  Typewriter Card Punch
826  Typewriter Punch Printer
867  Output Typewriter for 108
1980-14,15RPQ Selective Tape Listing Printer
2495  Tape to Card Reader
2911-14  RPQ Communication Switching Unit
4872  Modem
6405  Accounting Machine for 6400 System
6410  Accounting Machine for 6400 System
6420  Accounting Machine for 6400 System
6422  Automatic Ledger Feed for 6400 System
6424  Card Punch for 6400 System
6425  Magnetic Ledger Unit for 6400 System
6426  Card Punch for 6400 System
6428  Card Reader for 6400 System
6454  Paper Tape Reader for 6400 System
6455  Paper Tape Punch for 6400 System

February 29, 1984
834  Control Unit (Non Printing)
836  Control Unit (Printing)
866  Non Transmitting Typewriter
961  Tape Punch (8 track)
962  Tape Punch (5 track)
972  Auxiliary Keyboard
1960-10  RPQ Special Reader
1960-20  RPQ Special Processing Unit
2946-1  RPQ Terminal Control Unit

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TYPICAL MACHINE DESCRIPTION

The format used throughout the "Machines" section of the sales manual has been designed to give the reader, in "Highlights" form, as much information as possible in as few words as possible. A bracket to the right of any entry indicates a change or addition. A study of the points covered in this typical machine description will show where and how various types of information are covered in each description.

1. Purpose -- a capsule description of the machine's major functions.
3. Model Changes -- there are three categories: Field Installable, Not Recommended for Field Installation, or Available at Time of Manufacture Only. For a rental machine, the new monthly availability charge (see "Prices" below) is effective the day following installation of the model change.
4. Highlights -- capsule comments on sales advantages and functional operations.
5. Limitation(s) -- only those which apply to the machine itself ... limitations for Special Features appear in "Special Features" descriptions.
6. Prerequisite(s) -- other machines, special features, or "Specify" items required for installation of the machine ... usually related to system components.
7. Bibliography -- base number only. Consult the current appropriate system bibliography for listing of all available manuals pertaining to the machine on that system.
8. Specify -- this section lists items which will be furnished at no additional charge when specified on an initial machine order for plant installation at time of manufacture. Each item is identified by a name and a four-digit (9XXX) number preceded by a number sign (#). 9XXX numbers are also used as detailed specifications for certain special features listed in "Special Features" descriptions.
9. Prices -- for base machine

Rental (MAC) -- the monthly rental (monthly availability charge), exclusive of applicable taxes, for the base machine.

ETP, FTP -- Extended Term Plan (ETP) and Fixed Term Plan (FTP).

Purchase -- the purchase price, exclusive of applicable taxes, for the base machine.

MMMC -- Minimum Monthly Maintenance Charge for maintenance service on a purchased machine on a Maintenance Agreement ... charge provides for maintenance service availability during certain fixed weekday hours. (T&M = Time and Material)

Rental Plan -- the rental plan under which the machine is offered. For machines under Systems Plan "A", the entry 10% here indicates that hours of additional billable time are charged at an hourly rate of 1/176th of 10% of the monthly availability charge. 30% indicates that the hourly rate is charged at 1/176th of 30% of the monthly availability charge.

Purchase Option -- the percentage of the first year's rental which is credited against the purchase price when a rental customer purchases an installed machine.

Warranty -- applies to machines ordered on an Agreement for Purchase of IBM Machines

Maintenance -- indicates the machine group to be used when calculating the additional charge for maintenance for optional periods of Maintenance Agreement service availability.

Per Call -- the class of rates applicable to a purchased machine if it is subject to hourly service charges (e.g., where no maintenance agreement applies, service is requested outside the hours covered in the Maintenance Agreement, etc.).

Metering -- indicates the type of meter on a Systems Plan "A" machine.

Useful Life Category --

10. Special Features -- listed here are descriptions of the special features which can be added to the base machine ... each description covers in capsule form the additional function(s) supplied by the feature.

Installation -- there are three categories for installation of special features. Field Installable, Not Recommended for Field Installation, or Available at Time of Manufacture Only.

Prerequisite(s) -- other machines, special features, or "Specify" items required for installation of the feature.

11. Special Feature Prices

MAC -- the monthly availability charge, exclusive of applicable taxes, for the special feature. (SUC = Single Use Charge ... item remains property of IBM)

Purchase -- the purchase price, exclusive of applicable taxes, for the special feature. Also see FIC, below.

MMMC -- the Minimum Monthly Maintenance Charge on a purchased machine on a Maintenance Agreement. (T&M = Time and Material)

FIG -- the service charge for field installation of the special feature on a purchased machine. PO under this heading means plant installation only (cannot be field installed). Note: FIC does not apply to new machine types announced after June 1, 1970.

Note: Under any of the above headings, NC = No Charge.

3782 CARD ATTACHMENT UNIT

1. Purpose -- Used to attach the 2502 Card Reader model A1 or A2 to a 3774, 3775 or 3776 Communication Terminal, or to attach a 3921 Card Punch to a 3771, 3774, 3775 or 3776 Communication Terminal.

2. Model -- the 2502 Card Reader model A1 or A2.

3. Model Changes: Not recommended for field installation.

4. Highlights: The unit provides power and attachment circuits and serves as a stand for mounting the card machine.

PREREQUISITES:

Model 1 -- requires 3782/3521 Card Punch Attachment (#8150) on the 3771, 3774, 3775 or 3776 and a 2502 Card Reader model A1 or A2. The following specifies are required on the 2502: #9901 for 115 VAC, and #8046 for white color.

Bibliography: GC20-0001


Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9046 for gray.


9. Prices:

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<tr>
<th>Mdl</th>
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<th>ETP</th>
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Rental Plan: B

Warranty: B

Maintenance: D

Per Call: 1

SPECIAL FEATURES


Special Feature Prices:

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On some pages in the "Machines" section, there is a "Codes" heading under which will be shown SIU and ID. SIU = System Identification Unit; ID = Identity Code.

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3612 Passbook and Document Printer
3614 Consumer Transaction Facility
3615 Administrative Terminal Printer
3616 Passbook and Document Printer
3618 Administrative Line Printer
3624 Consumer Transaction Facility

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2747 Display Station
2748 Display Station
2749 Printer Model 1, 2
2788 Printer Model 1, 2
2789 Printer
3286 Line Printer
3287 Line Printer
3288 Line Printer
3601 Finance Communication Controller
3602 Finance Communication Controller
3631 Plant Communications Controller
3632 Plant Communications Controller
3641 Reporting Terminal
3642 Encoder Printer
3643 Keyboard Display
3644 Automatic Data Unit
3645 Printer
3648 Scanner Control
3767 Communication Terminal
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8101 Storage and I/O Unit
8130 Processor
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8809 Magnetic Tape Unit

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ACCESSORIES
See M 10000 pages

AUXILIARY PROCESSOR
3838 Array Processor

BANKING EQUIPMENT
803 Proof Machine
1255 Magnetic Character Reader
1419 Magnetic Character Reader
3890 Document Processor
3891 Document Reader/Inscriber
3896 Tape-Document Converter
(also see 1060)

COMMUNICATION SYSTEM (3790)
2741 Communication Terminal
3277 Display Station
3284 Printer
3286 Printer
3287 Printer
3288 Line Printer
3411 Mag Tape Unit & Control - mdl 1
3760 Dual Key Entry Station - mdl 1, 2
3760 Key Entry Station - mdl 3
3762 Key Entry Station
3791 Controller
3792 Auxiliary Control Unit
3793 Keyboard-Printer

DATA COLLECTION SYSTEM (1030)
1031 Input Station
1032 Digital Time Unit
1033 Printer
1034 Card Punch
1035 Badge Reader

DATA COMMUNICATION SYSTEM (2790)
1035 Badge Reader
2715 Transmission Control Unit
2740 Communication Terminal - mdl 1
2761 Area Station
2792 Remote Communications Controller
2793 Area Station
2795 Area Station
2796 Data Entry Unit
2797 Data Entry Unit
2798 Guidance Display Unit

DATA COMMUNICATION SYSTEM (3770)
2502 Card Reader
3203 Printer
3501 Card Reader
3521 Card Punch
3771 Communication Terminal
3774 Communication Terminal
3775 Communication Terminal
3776 Communication Terminal
3777 Communication Terminal
3782 Card Attachment Unit
3784 Line Printer

OPTICAL MARK READERS

DATA TRANSMISSION SYSTEM (1001)
1001 Data Transmission Unit
7770 Audio Response Unit

PLANET COMMUNICATION SYSTEM (3630)
3631 Plant Communication Controller
3632 Plant Communication Controller
3641 Reporting Terminal
3642 Encoder Printer
3643 Keyboard Display
3644 Automatic Data Unit
3645 Printer
3646 Scanner Control
3647 Time and Attendance Terminal
3842 Loop Control Unit

PROGRAMMABLE STORE SYSTEM (3650)
3275 Display Station Model 3
3294 Printer Model 3
3651 Store Controller Model 50
3683 Point of Sale Terminal
3685 Ticket Unit
3689 Store Communications Unit
3683 Supermarket Terminal Mdl 1P, 2, 3
3688 CheckOut Scanner
3687 CheckOut Scanner
3689 Store Communications Unit
3784 Printer

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# DATA PROCESSING SYSTEMS

## PROCESSORS

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## DATA CHANNEL UNITS

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X -- Attachment is made by standard equipment.

** Through 2150 only.
†† Not S/370 mdl 145-3.

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### Audio Response Units

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### Card Readers/Punches

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<td>3504 Card Reader</td>
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<td>3525 Card Punch</td>
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<td>5496 Data Recorder</td>
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### Communications Controller

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### Communications Terminals

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### Data Adapter Units

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<td>3705 Communications Controller</td>
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(1) See the 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

†† Not 145-3 models.

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## DISPLAY UNITS

| 2200 Display Unit -- mdl 1, 3 | X X X X X X X X X X X X X | S/7 |
| 2798 Guidance Display Unit | X | |
| 3240 Display Control | X X X X X X X X X X | |
| 3271 Control Unit | X X X X | |
| 3272 Control Unit | X X X X X X X X X X X X | |
| 3274 Control Unit -- mdl 1A, 1B | X X X X X X X X X X X X | |
| 3274 Control Unit -- mdl 1C | X X X X | |
| 3275 Display Station | X X X X | |
| 3276 Control Unit Display Station | X X X X | |
| 3277 Display Station | X X X X X X X X X X X X | |
| 3278 Disk Pack | X X X X X X X X X X X X | |
| 3284 Printer | X X X X X X X X X X X X | |
| 3286 Printer | X X X X X X X X X X X X | |
| 3286 Printer | X X X X X X X X X X X X | |
| 3289 Line Printer | X X X X X X X X X X X X | |
| 3289 Line Printer | X X X X X X X X X X X X | |
| 3297 Printer | X X X X X X X X X X X X | |
| 3297 Printer | X X X X X X X X X X X X | |
| 6179 Display Terminal | X | |

## DIRECT ACCESS STORAGE

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## DRUM/FIXED HEAD STORAGES

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## MAGNETIC CHARACTER READERS

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### DATA PROCESSING SYSTEMS

#### MAGNETIC TAPE UNITS

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* Model 4 only on 4331.
+ Not 135-3 models.
++ Not 145-3 models.

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### DATA PROCESSING SYSTEMS

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* Not 3145-3 models.
** Through 2150 only ... Not 3145-3 models.

Not to be reproduced without written permission.
LIST OF SPECIAL FEATURES/MODEL UPGRADES FOR PURCHASED MACHINES FOR WHICH THE REPLACED PARTS BECOME THE PROPERTY OF IBM

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* Single dense storage technology models (U4, U6, U8; M4, M6, M8; A4, A6, A8).

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* See applicable machine page for model conversion/feature restrictions.

**NOTE:** This list does not include GSD "Exclusive" machines or RPQ machines.
# LIST OF NON-FIELD INSTALLABLE SPECIAL FEATURES/MODEL CONVERSIONS

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<td>6660</td>
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</tr>
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</table>

* See applicable machine page for model conversion/feature restrictions.

NOTE: This list does not include GSD "Exclusive" machines or RPQ machines.
**357 INPUT STATION**

[The 357 Models 4, 5 and 6 are no longer available]

**Purpose:** Badge and/or serial card reader input unit for a 357 Data Collection System.

**Model 4** — a badge reader which operates as an independent input station. Reads identification badges (size of a 22-column stub card) prepushed in IBM code with a maximum of ten numeric digits. Badges, which are punched on a 13 Badge Punch, are inserted and removed manually. Badge read-out is automatic with insertion of badge. See Manual GA21-9028 for badge specifications. Badges can be purchased from outside vendors or produced by commercially available laminating equipment.

**Model 5** — a serial card reader. Standard unscored 60-column cards are inserted and removed manually, one at a time. Reads numbers, letters, IBM special characters, and instruction codes. Blank columns are not recognized and are automatically skipped over. Provision is made for attaching a 372 Manual Entry or 374 Cartridge Reader.

**Model 6** — a combination serial card reader and badge reader. Information pertaining to mdls 4 and 5 applies to mdl 6. This model, in conjunction with a 372 or 374, provides a means of loading the station with variable source data as well as fixed employee and job data prior to transmission to the output unit. An instruction code in the card shifts transmission of data from card to badge. A separate column must be used in the card being read for each column of the badge which is to be read out, unless Badge Read-out (#1450), a special feature, is installed. See Manual GA21-9028 for badge specifications.

**Model Changes:** Cannot be made in the field.

**PREREQUISITE:** A 358 Input Control Unit ... each 358 controls up to twenty 357s, in any combination of models.

**Badge Gauge:** Available at no charge for use with mdls 4 and 6 to check width and thickness of badges ...

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621.

**SPECIFY:** [1] Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

**[2] Color:** #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

**PRICES:**

<table>
<thead>
<tr>
<th>Model</th>
<th>MAC/</th>
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<th>Purchase</th>
<th>MMMC</th>
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Plan Offering: Plan B Purchase Option: 60% Maintenance: C Warranty: B Per Call: 1

**SPECIAL FEATURES**

**BADGE READ-OUT (#1450).** [Model 6 only] [Plant Installation only] Enables the mdl 6 to read a badge only. When both a card and a badge are to be read, a single instruction code in the card shifts transmission to the badge reader for automatic read-out of the badge. Patch panel wiring in the mdl 6 controls read-out. A 'Badge' position on the mode switch provides automatic badge read-out upon insertion of a badge.

**CONTROLLED RESET (#2287).** [Model 5, 6 only] Manually operated switch in non-reset position permits retention for re-reading of any fixed combination of the badge, 372 Manual Entry setting, or the data cartridge. Operator set-up time at a terminal is reduced when entering a series of transactions with common data in the manual entry, data cartridge and/or badge.

**Special Feature Prices:**

<table>
<thead>
<tr>
<th>Model</th>
<th>MAC/</th>
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<td>95</td>
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---

**358 INPUT CONTROL UNIT**

[The 358 Model 1 is no longer available]

**Purpose:** Links up to twenty 357 Input Stations with one 24/26* Card Punch in a 357 Data Collection System.

**Highlights:** Analyzes instruction codes in input cards and controls card reading. Instruction codes are wired through a transaction selector in the 358 to format control. Data, in the form of DC pulses, is transmitted over multi-conductor cable and punched at the rate of approximately 18 characters/second on the 26, or 20 characters/second on the 24.

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621.

**SPECIFY:** Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

**PRICES:**

<table>
<thead>
<tr>
<th>Model</th>
<th>MAC/</th>
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Plan Offering: Plan B Purchase Option: 50% Maintenance: C Warranty: B Per Call: 1

---

**360 CLOCK READ-OUT CONTROL**

[The 360 Model 1 is no longer available]

**Purpose:** Controls read-out of time from a 361 Read-out Clock to up to thirty-five card punches in a 357 Data Collection System ... see "Limitation" below.

**Highlights:** Has connections for two 361s ... a toggle switch permits switching from one clock to the other.

**Limitation:** Time can be provided for simultaneous output to up to ten 24/26's ... for applications such as attendance recording, a 360 and 361 are required for each group of ten 24/26's which may simultaneously call for time.

**PREREQUISITE:** Clock Read-in (#1945) on the 24/26* Card Punch.

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621.

**SPECIFY:** Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

**[2] Cable:** #9081 for direct connection to a single output punch, or #9082 for connection to multiple punches via a common line ... see Physical Planning Manual GA24-1032.

**PRICES:**

<table>
<thead>
<tr>
<th>Model</th>
<th>MAC/</th>
<th>MRC</th>
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Plan Offering: Plan B Purchase Option: 60% Maintenance: C Warranty: B Per Call: 1

---

**361 READ-OUT CLOCK**

[The 361 Model 1 is no longer available]

**Purpose:** Provides a means of punching time in output cards in a 357 Data Collection System.

**Highlights:** Time is read out as four digits ... hours (0-23) and nearest hundredths of hours.

**PREREQUISITE:** A 360 Clock Read-out Control and Clock Read-in (#1945) on the 24/26* Card Punch.

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621.

**SPECIFY:** Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

**PREREQUISITE:** Clock Read-in (#1945) on the 24/26* Card Punch.

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621.

**SPECIFY:** Voltage (115 V AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

**PRICES:**

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<thead>
<tr>
<th>Model</th>
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Plan Offering: Plan B Purchase Option: 60% Maintenance: C Warranty: B Per Call: 1

---

* The 24 and 26 are GSD Machines.
**372 MANUAL ENTRY**

*The 372 Models 1, 2 and 3 are no longer available*

**Purpose:** For manual entry of data for transmission in a 357 Data Collection System.

- **Model 1** Has six slides.
- **Model 2** Has nine slides.
- **Model 3** Has twelve slides.

**Model Changes:** If Supervisor Key (7578) is not installed, changes can be made from mdl 1 to 2 or 3, or mdl 2 to 3.

**Highlights:** Has up to twelve numeric slides, each with eleven character positions (0-9 and blank), which can be individually labeled. Slides may be locked in any desired position, or may restore to blank after each transmission. CE can wire any or all of the slides to read out zero from the blank position ... to change all positions to read out zero from the blank position, no additional parts are required ... to change any other number of positions, Part No. 765993, Jumper Assembly, must be ordered.

**Limitation:** Either a 372 or a 374 Cartridge Reader can be attached to a 357 mdl 5 or 6, not both.

**PREREQUISITE:** Each 372 requires a 357 mdl 5 or 6.

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621.

**SPECIFY:** Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

**PRICES:**

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Plan Offering: Plan B

- Purchase Option: 60% Maintenance: C
- Warranty: B
- Per Call: 1

**SPECIAL FEATURES**

**SUPERVISOR KEY (#7578).** Replaces left hand slide on mdl 1, 2 or 3 with a key-operated switch which provides a controlled ability to insert a specific authorizing digit in the output card for a transaction. Field Installation: Available at time of manufacture only.

**Special Feature Prices:**

<table>
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Plan Offering: Plan B

- Purchase Option: 65% Maintenance: C
- Warranty: B
- Per Call: 1

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**373 PUNCH SWITCH**

*The 373 Model 1 is no longer available*

**Purpose:** For automatic switching to a second output punch in a 357 Data Collection System.

**Highlights:** Provides automatic switching to a second back-up punch if the first fails to duplicate, jams, or runs out of cards. Either or both punches may be placed in offline mode for use as a regular card punch by placing the "Auto" switch to "Keypunch."

**PREREQUISITES:** Two output punches per system ... 24/26 mdl 7 or 8, each with Punch Switch Control (#5930) ... see 26.

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621

**SPECIFY:** If old-style Elco (rectangular) connector on 358, order Adapter Cable Assembly, 765183, no-charge.

**PRICES:** Mdl

<table>
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<tr>
<th>MAC/ MRC</th>
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Plan Offering: Plan B

- Purchase Option: 65% Maintenance: C
- Warranty: B
- Per Call: 1

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**374 CARTRIDGE READER**

*The 374 Model 1 is no longer available*

**Purpose:** Data cartridge input unit for a 357 Data Collection System.

**Highlights:** The IBM Data Cartridge permits the user to pre-set up to 12 positions of variable numeric data at his regular work station ... use is applicable primarily where variable numeric data must be entered into the system at a peak period. Throughput and accuracy in the 357 Input Station are increased and employee waiting time is reduced.

The cartridge is manually inserted and removed from the reader, which is cable-connected (3-1/2 feet) to and wall mounted to the right of the 357.

For use with 357 mdl 5 or 6, the cartridge is read out by the card in the same manner as the 372.

One data cartridge is supplied with each 374 ... ,

**PREREQUISITE:** Each 374 requires a 357 mdl 5 or 6.

**Limitation:** Either a 374 or a 372 Manual Entry can be attached to a 357 mdl 5 or 6, but not both ... however, 372s and 374s can be interchanged on a terminal without requiring changes in the output card of the output program.

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621.

**SPECIFY:** Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

**PRICES:**

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Plan Offering: Plan B

- Purchase Option: 60% Maintenance: C
- Warranty: B
- Per Call: 1

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DP Machines

729 II/IV/V/VI MAGNETIC TAPE UNITS
[No longer available]

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<tr>
<td>729 IV</td>
<td>22,500/62,500</td>
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<tr>
<td>729 V</td>
<td>15,000/41,700/80,000</td>
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<tr>
<td>729 VI</td>
<td>22,500/62,500/90,000</td>
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Model Changes: 729 IIs can be changed to 729 Vs, or 729 IVs to 729 VIs.

The following specifications can be changed in the field:

1. Voltage (AC, 3-phase, 60 Hz): #9003 for 208 V, or #9005 for 230 V (must be consistent with system voltage).

2. Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

SPECIAL FEATURES

The following special feature is on an 'as available' basis for field installation.

TAPE SWITCHING FEATURE (#7830). Modifies the tape unit so that it can be logically switched between any two tape channels to which it is normally attached. Switching can be between two channels in the same system, channels of any two systems which use 729 II/IV/V/VI/IVs, or a system channel and an offline auxiliary unit. [Caution: Care should be exercised in connection with density compatibility between channels, or the system channel and the offline unit.] Two add' l signal cable connectors, switching relays, a control cable connector and 50' of control cable are provided for attachment to the 7155. Advantages are: [1] Less tape unit set-up time ... [2] Less tape reel handling time ... [3] Permits scheduling of peak load use of tape units ... [4] Possible reduction of tape units required in an installation. See Manual GG22-6587 for details. Prerequisite: A 7155 Switch Control Console or 7711 Data Communication Unit.

Tape Switch Feature #7830

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<tr>
<td>Purchase</td>
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</table>

* FTP = 12-23 months.


803 PROOF MACHINE

Note: The 803 Proof Machine is no longer available ... for models changes and special features, see below.

Purpose: The 803 Proof Machine is used to simultaneously list, sort and prove business documents.

Model 1 Endorsing ... 32 compartments and keys.
Model 2 No endorsing ... 32 compartments and keys.
Model 3 Endorsing ... 24 compartments and keys.
Model 4 No endorsing ... 24 compartments and keys.

Note: Models 3 and 4 are capacity reduced from models 1 and 2, Multicompartments 25 thru 32 inoperative.

Model Changes: Can be made in the field ... except from a 24 compartment machine to a 32 compartment machine.

Note: 802 models changes may be made in the field.

Highlights: Each sorting receptacle can hold approximately 150 documents (5/8" to 21/32"). Documents within the following dimensions can be fed: Width = 2-1/4" to 4-1/4" ... Length = 4" to 9-1/2" ... Thickness = cannot exceed 3/32".

The cycling speed, fully-electric adding keyboard, repeat key, and other operating features permit continuous high-speed operation.

Amounts are simultaneously listed on both the control tape and one of the compartment tapes and accumulated in the grand, group and compartment total counters. All items, together with their identifying distribution numbers, are listed on a control tape.

Up to 9-digit amounts can be entered through the adding keyboard for listing.

Each total counter has a printing capacity of 10 digits. Progressive totals (sub-totals) can be obtained on all counters and printed with an identifying symbol. For subtraction, the complement of the amount to be subtracted is entered on the adding keyboard and the "Subtract" key is depressed. 9s are then automatically printed to the left of the amount. On total accumulation and printing, the tenth position is not lost even though subtraction is by complementary addition.

Standard Features -- Control Panel with Non-feed Lock Switch, Multiple Entry, Endorse Suppression (mdls 1, 3), Group Balancing, Group Balance Compartment Add Add ... Amount Clearance Lever ... Repeat, Multiple Entry, Auxiliary Credit, Adding Machine, Non-add C, Non-add C and C, Key Release, Subtraction, Grand Total, Group Total, Compartment Total, and Progressive Total Keys ... Ready, Add Key Depression, Near Depletion of Listing Tape, Non-endorse (mdls 1, 3), Non-feed, Full Pocket, Improper Feeding, and Non-balance Condition when Group Balancing Signals ... Switches -- for control of credit feeding and by-passing of automatic group balance totals for single machine cycle ... Paper Clip Receptacle ... Selected Compartment Indicator ... Ticket Tray ... two 5-position Transaction Counters ... Upholstered Arm Rest ... Work Tray.

Endorsing -- mdls 1 and 3 can endorse documents with date, identification numbers, and bank's legal endorsement. The Endorser Plate is made to the customer's specifications. See "Accessories" below. A Blank Endorser Plate is also available if only partial endorsements are required. When ordering #3792 attach Endorser Plate Specification ... not required for #3793.

Supplies -- endorser ink roll, paper and ribbon supplies.

Manuals -- see "IBM Marketing Publications KWIC Index," G330-1621.

Specify: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.
[3] Disabling Clamps: If required to prevent depression of the following key(s) -- #9120 for Subtract Key, #9121 for Repeat Key, #9122 for Auxiliary Credit Key. Limitation: #9122 cannot be installed with Multiple Credit (#5245).

M 803
May 79

PRICES: Mdl MAC/ MRC Purchase MMC
803 1 $205 $9,000 $108.00
2 193 5,480 99.50
3 167 7,345 89.50
4 156 6,805 80.50

Plan Offering: Plan B Purchase Option: 35% Maintenance: C
Warranty: B | Call: 1
1 Prices for 802 mld 1 are Rental -- $120, Purchase -- $7,785
and MMC --$73.50 ... prices for 802 mld 2 are Rental -- $110, Purchase -- $7,215 and MMC -- $65.00.

SPECIAL FEATURES

NOTE: The following 803 feature can also be ordered for field installation on installed 802 Proof Machines.

MULTIPLE CREDIT (#5245). To simplify processing of multiple credit transactions under control of automatic group processing ... can also be used where single item deposits are processed in batches. A total can be obtained for a group of debits and balanced against a group total of the related credits. A "Multiple Credit" key replaces the standard "Auxiliary Credit" key. Prior to taking a group total of debit items, the '"Group Balance By-pass" switch and "Multiple Credit" key are depressed, in that order. Any number of credit items can then be distributed without depressing the by-pass switch before recording each transaction. The multiple credit key remains depressed until the by-passed debit total is entered on the keyboard and a group balance operation is performed. Limitation: Cannot be installed if Disabling Clamp (#9122) for Auxiliary Credit Key is installed.

Special Feature Prices: (803) MAC/ MRC Purchase MMC
Multiple Credit #5245 $ 4 $ 257 $ 2.50 $ 19

Accessories -- The following items are available on a purchase only basis for the 803. For shipment with machine, order the desired Feature # indicated below at the price listed in M 10000 pages.

Endorser Plate (#3792) -- 803 mdls 1 and 3 only.
Blank Endorser Plate (#3793) -- 803 mdls 1 and 3 only. Illuminating Lamp (#4610) -- 803, all mdls.

Note: When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M 10000 pages for description, ordering instructions and field installation.

For the 802, #3792 is available for field installation on mld 1 ... #4610 is available for field installation on all mdls.

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1001 DATA TRANSMISSION TERMINAL

Purpose: Combination punched card and keyboard unit for direct transmission to a 26* Card Punch mdl 5 or 6, or to a 7770 Audio Response Unit.

Highlights: Has a 10-digit keyboard and a card carriage with a fixed 80, 51 or 22-column feed. First 22 columns of prepunched data can be read from each card. To transmit data from a card, operator inserts card in carriage, face down, column 80 first; moves carriage to the left until it strikes carriage stop and releases it. As carriage returns to right hand position, first 22 columns of card are read serially from column 1 to 22. Limitations: Field skipping is not possible ... columns 23 and 24 must be unpunched.

Variable numeric data is entered via the keyboard ... additional function keys control the receiving unit. The 80-column card in a 26 mdl 5 or 6 can accept up to 80 columns of transmitted data.

When equipped with Alphabetic Transmit (#1222), the 1001 can transmit alphanumeric data to a 26 equipped with Alphabetic Receive (#1221) ... see "Special Features" below and under 26. When #1221 is installed on a 26, numeric 1001s can be used only if they use alphabetic transmitting data sets, or if the 26 is equipped with Intermix (#4702).

The unit weights only 21 pounds. It is cable-connected to the telephone hand set, from which it obtains its power. Its size, 18-1/2" x 8" x 5", makes it a convenient desk or table top unit.

Communication Facilities: The 1001 transmits at a rate of 12 characters/second over common carrier leased private line.

Port-A-Punch® Cards: Column 80 of card cannot be part of a Port-A-Punch field ... a maximum of 11 Port-A-Punch columns can be read on a numeric 1001; a maximum of 18 if Alphabetic Transmit (#1222) is installed ... no punching is allowed in the columns adjacent to the Port-A-Punch columns ... the columns to be read can vary in number within the maximums, but must be adjacent ... on a numeric 1001, column 24 cannot be punched; with #1222, column 38 cannot be punched. Care should be exercised in handling and inserting Port-A-Punch cards so that chads will not be loosened.

Limitations: The standard machine feeds only standard punched card stock ... Aqua Cards or other special cards (except Port-A-Punch) cannot be fed by either feed.

Environment: The unit should be located in an area free of significant abrasive, corrosive and vibration producing elements. It should not be subjected to temperatures beyond the range of 40° to 120° F, or relative humidities of 20% to 85% ... where no cards are used, humidities to 95% are allowable. For best transmitting results, it is recommended that the unit be located in an area free of background noise.


SPECIFY: [1] Feed: #9181 for 80-column, #9183 for 51-column, or #9184 for 22-column. #9181 can be changed to #9183, or vice versa, in the field.

[2] Output Unit: #9470 if transmission is to a 26, or #9471 if transmission is to a 7770.

PRICES: Mdl MAC/ MRC Purchase MMMC 1001 1 $ 16 $ 455 $ 4 Plan Offering: Plan B Purchase Option: 45% Maintenance: C Warranty: B Per Call: 1

* The 26 is a GSD machine.

1026 TRANSMISSION CONTROL UNIT

[No longer available]

SPECIAL FEATURES

ALPHABETIC TRANSMIT (#1222). [Plant installation only] To transmit 26 alphabetic characters and three special characters ("12", "11" and "0-1"), as well as the standard 10 digits, from first 36 columns of each prepunched card. In transmitting to a 26, if a "space" is preferred to the "D-1" punch at the 26, order Space Code Generation (#7244) for the 26. Limitations: Operates only with an 80 or 51-column feed ... 22-column stub cards cannot be processed ... columns 37 and 38 in cards to be transmitted must be left unpunched (in lieu of columns 23 and 24 left blank when this feature is not installed) ... field skipping is not possible.

Special Feature Prices: MAC/ MRC Purchase MMMC FIC Alphabetic Transmit #1222 $ 8 #281 $.75 PO

The following specifications can be changed in the field:

[1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

The following special features are on an "as available" basis for field installation:

ADDITIONAL LINE FEATURE (#1058). Required on each 1026 attached to a system after the first 1026. Maximum: One. Prerequisite: Expanded Line Feature (#3837) on the first 1026 attached to the system.

AUTOMATIC ANSWERING (#1286). Provides the 1026 with the ability to automatically answer incoming calls initiated by remote 1050s over common carrier switched (dial-up) facilities ... the line must be equipped with an appropriate data set. Maximum: One.

AUTOMATIC CALLING (#1304). Provides the 1026 with the ability to automatically initiate outgoing calls initiated by remote 1050s over common carrier switched and/or a TWX facilities ... the line must be equipped with an appropriate data set and automatic calling unit. Maximum: One. Prerequisite: Automatic Answering (#1286).

EXPANDED LINE FEATURE (#3837). Provides controls on the first 1026 attached to the system for attachment of up to three additional 1026s and/or a 1032 Digital Time Unit. Maximum: One, on first 1026 only.

FIXED TIME-OUT (#4415). Provides for a transmission delay of approximately 1 second following the transmission of either a Horizontal Tab, or a New Line and Line Feed. Specify: One or both of the following -- #9340 for Horizontal Tab ... #9485 for New Line and Line Feed.

LINE ADAPTER (#4790). For attachment of a communication line that can be used for on-site 1030, 1050, 1060 or 1070 terminals for a distance up to 5 miles. No common carrier data sets are required. Line lengths for this feature will vary, depending upon type of cable and configuration of system. Use of common carrier channels also requires special considerations. For assistance with line configuration problems, consult Regional Physical Planning Representatives. Maximum: One. Specify: One of the following -- #9420 for use with 1030s, #9421 for 1060s, #9422 for 1050s or 1071 mdl 1s, or #9423 for 1071 mdl 2s.

Additional Line Fee: #1058 $ 5 $ 252 $.50 $30 Automatic Answering 1286 10 506 .50 14 Automatic Calling 1304 41 1,945 .75 32 Expanded Line Feature 3837 5 252 .50 32 Fixed Time-out 4415 5 252 .50 15 Line Adapter 4790 10 506 .50 29

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Purpose: Input station for a 1030 Data Collection System. Used to transmit data at 60 cps from cards, badges, data cartridges or manual entry to a 1026/1448 Transmission Control Unit, 1034 Card Punch, 2025 Processing Unit with Integrated Communications Attachment (#4580), 3115 or 3125 Processing Unit with Integrated Communications Adapter (#4640), 2701 Data Adapter Unit, 2702/2703 Transmission Control, or 3704/3705 Communications Controller.

Models: Control Station Satellite Station
For card input A1 B1
For card input and manual entry A2 B2
For card and data cartridge input A3 B3
For card and badge input and manual entry A4 B4
For card, badge, and data cartridge input A5 B5
For badge input A6 B6
For card and badge input A7 B7

Model Changes: Cannot be made in the field.

Highlights: A compact industrial unit. Offers station set-up checking prior to communication line acknowledgement, ease of operation, installation and relocation. NOTE: Can be mounted on a wall or a free standing pedestal. Wall brackets or pedestal are not included in the unit’s price. Pedestals are available from IBM or outside vendors. See SRL GA24-3021 for pedestal specifications.

1031 mdls As provide data transmission via 2-wire communication lines and control 1031 mdl Bs and 1033 Printers attached to them by bi-wire cables. As far as the user is concerned, comparable A and B models are identical. Depending upon the model, the 1031 has one or more of the following means of input and output and standard features:

Card Reader — standard or Port-A-Punch® prepunched 80-column cards can be individually inserted and removed manually. An upper left corner cut C1 is required. M3, M4 and M5 scores can be used. Numbers, letters and IBM special characters (see SRL GA24-3018) are read. Blank card columns are not recognized and are automatically skipped.

Badge Reader — reads identification badges (22-column stub card size) prepunched in IBM code with a maximum of ten digits. The badges, which are punched on a 13 Badge Punch, are inserted and removed manually. Badges with or without a pocket clip can be read. They can be purchased from outside vendors, or produced by commercially available equipment. See SRL GA21-9028 for badge specifications. NOTE: A badge gauge is provided at no charge with each badge punch ... see 13 Badge Punch.

Manual Entry — a means of entering variable numeric source data in addition to the fixed data entered by card and badge. Each of the 12 slides has 11 character positions (0-9, and blank), and can be individually labeled. The slides rest to blank after each correct transmission, or may be restored by depressing the clear button for operator or retransmission error. Panel wiring provides detection of columns set to blank for selected groups of slides.

Cartridge Reader — reads the data cartridge, a device which provides for off-station entry of up to 12 positions of variable numeric data. The cartridge is inserted and removed manually. Cartridge slides retain their setting and are not restored by action of the reader. Panel wiring provides detection of columns set to blank for selected groups of slides.

One data cartridge is furnished with each 1031 mdl A3, A5, B3, B5 ... pocket size — 7-3/8" long, 3-1/4" deep, and 1/2" thick ... used for setting up variable information away from the 1031, reducing station set-up time and making the 1031 available to more users in a given period. Additional cartridges...

Lights — all models have appropriate Card, Badge, Manual Control, Repeat, and In-process indicator lights.

Clear Button — on all models, ejects all cards, badges and data cartridges and restores the manual entry and cartridge reader.

Mode Switch — on mdls A2 thru A5, A7, B2 thru B5, B7, places the 1031 in card, badge or manual control mode.

Set-up Instruction Reference — on mdls A2, A4, B2, B4, a thumb knob and scroll which gives rapid reference to set-up instructions.

Customer Responsibilities — see 1030 in "Systems."

PREREQUISITE: Line terminators will be shipped from the plant. Line terminators are provided to the customer at no charge. For guidance in determining the number of line terminators required, see Physical Planning Manual, GA24-3021.

LIMITATIONS: 1031 mdls As

[1] Distance — the maximum length of a customer-provided 2-wire communication line is a function of the number of input stations, line characteristics and network configuration. Approximate limitations are up to 8 miles. A Common Carrier Adapter (#2068), operating with external data sets, or an IBM Line Adapter (#4647) permits transmission over greater distances via a 4-wire full duplex common carrier leased voice grade channel. Detailed information on communication lines is contained in SRL GA24-3021. See the M 2700 pages for information on communication facilities.

[2] The maximum number of 1031 As per 2-wire line is ten.

[3] A maximum of eight 1031 Bs can be connected to a 1031 A.

[4] A maximum of twenty-four 1031s, mdl As and Bs combined, can be attached to a 2-wire line.

[5] Up to nine 1033s can be attached to a 1031 A equipped with a 1033 Printer Attachment (#1279) ... up to twenty-four 1033s can be attached to one 2-wire line. NOTE: Up to twenty-four 1033s plus twenty-four 1031s can be attached to one line.

[6] When the line terminates in a 1034 Card Punch, 1033s cannot be attached to the line.

[7] Either a 1033 Printer Attachment (#1279) or a Common Carrier Adapter (#2068) can be installed on a 1031 A, not both.

1031 mdl Bs

[1] Maximum cable length (1031 B to 1031 A) is 3,000 feet.

[2] A maximum of eight 1031 Bs can be attached to a 1031 A.

Environment: See 1030 in "Systems."


SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9980 for 115 V, locking plug, or #9881 for 115 V, non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Method of Installation: #9410 if junction box, or #9411 if junction point. Cables or connectors will be shipped automatically prior to scheduled delivery. A 20’ 2-wire main line signal cable is shipped for a 1031 A. See Physical Planning Manual GA24-3021.

PRICES: Mdl MRF Purchase MMMC

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Plan Offering: Plan B Purchase Option: 45% Maintenance: C Warranty: B Per Call: 1

SPECIAL FEATURES

ATTACHMENT, 1033 PRINTER (#1279). [Models A1 thru A7 only] To control up to nine 1033 Printers by one 1031 A. Includes 4' junction box cable or connector as specified in "Method of Installation" under "Specify" above. Limitation: Cannot be installed with Common Carrier Adapter (#2068).

COMMON CARRIER ADAPTER (#2068). [Models A1 thru A7 only] Provides for long distance data transmission via external data sets over 4-wire full duplex communication lines provided by common carriers. Note: Where multiple 1031 mdls As are to operate over a 4-wire full duplex line, only one 1031 mdl A is directly connected to the external data set ... additional 1031 mdls As are connected to the first 1031 mdl A, which is interfaced to the external data set, via a 2-wire communication line ... specifications for the 2-wire line are contained in SRL GA24-3021. Limitation: Cannot be installed with 1033 Printer Attachment (#1279) or IBM Line Adapter (#4647).

Specify: For cable assembly from 1031 mdl A to common carrier data set ... #9021 and quantity (length in feet ... maximum, 40).


† For further information on IBM Line Adapters, see M 2700 pages.

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1031 Input Station (cont'd)

1031 IBM LINE ADAPTER (#4647). [Models A1 thru A7 only] A modern to allow the 1031 md:1 terminal to communicate over unlimited distances with a 2702/2703 Transmission Control, 3704/3705 Communications Controller, a 2025 with ICA (#4580) via a 2711 Line Control (#4840), or a 1034 Card Punch. This adapter uses 4-wire leased common carrier private lines, or equivalent privately owned communication facilities. When installed, the standard 2-wire, 8 mile modem cannot be used. For line specifications, see SRL GAZ-3435**. Up to twenty-four 1031 md: As, each equipped with this feature, can be multipropuposed on a line. Common carrier considerations, however, will limit the size of the network. If a system with more than ten points is proposed, a service inquiry to the common carrier must be initiated by the customer. Limitation: Cannot be installed with Common Carrier Adapter (#2068).

Prerequisites: An IBM Line Adapter (#4647) on the 1034 or 2711.


INPUT EDIT LEVELS, ADD'L (#4654). [Models A2 thru A5, B2 thru B5 only] A group of four additional input levels (E, F, G, H). Input edit levels are used to select the proper input device for a given transaction, edit the input before transmission, and select the proper point for end-of-block code. Limitation: Cannot be installed with 1035 Attachment (#7961).

INQUIRY KEY (#4684). [Models A2 thru A7, B2 thru B7 only] Permits authorized inquiry to a system processor ... output is via a 1033 Printer. One key is provided ... additional keys, MONITOR KEY (#5140). [Models A2 thru A7, B2 thru B7 only] Used where a supervisor's approval is required before a record can be transmitted. One key is provided ... additional keys, 1035 ATTACHMENT (#7961). To attach from one to four 1035 Badge Readers. Provides a means of scanning up to 30 columns of badge punching and assigning badge reader identification characters. Includes a 4' cable for junction box connection to 1035s, shipped automatically.

Limitations: Plant installation only on 1031 A models ... cannot be installed with ADD'L Input Edit Levels (#4654). Installation of this feature is incompatible with some 1031 RPDs.

Prerequisites: For 1031 A md:ls – 1035 Control (#7962) ... for 1031 B md:ls – #7962 on the controlling 1031 md: A.

1035 CONTROL (#7962). [Models A1 thru A7 only] Required on a 1031 md: A to install a 1035 Attachment (#7961) on the 1031 md: A itself, or on any 1031 B md:ls controlled by the 1031 md: A. The feature detects any blanks and invalid data transmitted from badge readers and controls operation of Repeat lights for the 1035s.

MAC/ Special Feature Prices:
      MRC Purchase  MMMC  FIC
            Attach, 1033 Printer #1279 $16 $ 715 $1.50 $ 21
            Common Carrier Adapter 2038 28 1,155 1.00 34
            Common Slide Lock, gp of 3 2520 10 95 1.00 17
            IBM Line Adapter 4647 10 347 3.50 132
            Indvl Slide Lock, gp of 3 4652 2 95 1.00 9
            Input Edit Levels, Add'l gp of 4 4654 4 186 1.00 16
            Inquiry Key 4684 43 1.00 17
            Monitor Key 5140 2 30 1.00 9
            1035 Attachment 7961 16 650 1.50 138
            1035 Control 7962 5 225 1.00 47

1032 DIGITAL TIME UNIT

Purpose: Used to associate time of day with output records of a data collection system.

Model 1 Has a synchronous motor drive.

Model 2 Is minute impulse self-regulating ... for attachment to the user's master clock system.

Model Changes: Cannot be made in the field.

Nights: Can furnish time data ... twenty 24/26 Card Punched and 1034 Card Punched ... twenty 2702 Transmisson Controls.

Time advances once every minute and is read out as 4 digits ... nearest hundredths of hours. Can be used for 357 and 1030 Data Collection Systems, either on or off-line.

** SRL GAZ-3435-2, or subsequent revisions.

Warning is provided upon the return of interrupted power, or failure of the timing source (synchronous motor or master time system) to initiate an advance cycle once every minute. Clocking periods for 24/26s or 1034s can be activated on any minute automatically or by manual operation. Synchronous standby is provided with the 1032 md: 1.

PREREQUISITES:

For 24/26s (357) – Clock Read-in (#1945) on each 24/26 ... Digital Time Read-out Control, 24/26/1034 (#3267) on the 1032 itself ... see "Special Features" below and GSD sales manual for 24/26 description.

For 1034s (1035s) – Digital Time Read-in (#3268) on each 1034 ... Digital Time Read-out Control, 24/26/1034 (#3263) on the 1032 itself ... see "Special Features."

For 1026s – Expended Line Feature (#3837) on the first 1026 ... Digital Time Read-out Control, 1026 (#3269) on the 1032 itself ... see "Special Features."

Common Carrier Adapter Set - 1050/1060 (#2070) ... see "Special Features."

SPECIFY: Voltage (AC, 1-pha, 60 Hz): Locking plug – #9880 for 115 V. #9884 for 208 V. #9885 for 230 V. Non-lock ... #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V ... must be consistent with voltage of 1026, 1448 or 2702.

PRICES: Mdl.

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Plan Offering: Plan B Purchase Option: 50% Maintenance: C Per Call: 1

SPECIAL FEATURES

CLOCKING PERIOD ON-OFF CONTROL, ADD'L (#1940). For packed card punch operation ... a group of four periods in addition to those supplied with feature #3267 ... see below. Maximum: One.

DAY-OFF WEEK READ-OUT, 24/26/1034 (#3219). Numbers the days of the week 1 thru 7 for punching into cards on 24/26/1034 card punches in 357 or 1030 Data Collection Systems. Upon reaching day 7, the next advance returns the device to day 1. Advancement from one day to the next may be wired (pluggable) to cause a day change at any minute during the 24-hour period. Read-out to 1034s consists of 5 digits (tens of hours, units of hours, tenths of hours, hundredths of hours, and day-of-week). Read-out to 24/26s is limited to 4 digits (tens of hours, units of hours, day-of-week) ... hundredths of hours cannot be punched in output records when used with a 24/26.

Prerequisites: Digital Time Read-out Control, 24/26/1034 (#3267) ... Day-of-Week Read-in (#3200) on each 1034.

DIGITAL TIME READ-OUT CONTROL, 24/26/1034 (#3267). Provides compatibility with 24/26/1034 card punch used for output from 357 and 1030 Data Collection Systems ... can read time to any combination of up to twenty card punches. Specify: #9871 for 4' cable assembly from 1032 to junction box for multiple 24/26s (cable shipped 30 days prior to scheduled delivery), or #9019, for 15' cable assembly from 1032 to a single 24 or 26. Note: Cable assembly for 1034 attachment to 1032 is included with Digital Time Read-in (#3268) on 1034 ... see 1034.

DIGITAL TIME READ-OUT CONTROL, 1448 (#3268). Provides compatibility with a 1448 Transmission Control Unit. A maximum of two 1448s can be attached to a 1032 for time read-out. One #3268 is required on the 1032 for each 1448. A 20' cable (1032 to 1448) is provided with each feature. Limitation: Cannot be installed with #3268 or #3273. Maximum: Two.

DIGITAL TIME READ-OUT CONTROL, 1026 (#3269). Provides compatibility with a 1026 Transmission Control Unit. A 15' cable (1026 to 1026) is provided. Limitation: Cannot be installed with #3268 or #3273. Maximum: One.

DIGITAL TIME READ-OUT CONTROL, 2072 (#3273). Provides...
1032 Digital Time Unit (cont'd)

compatibility with a 2702 Transmission Control. A maximum of two 2702s can be attached to a 1032 for time read-out. One #3273 is required on the 1032 for each 2702. A 20' cable (1032 to 2702) is provided with each feature. Limitation: Cannot be in­stalled with #3268 or #3269. Maximum: Two.

Special Feature Prices:

MAC/ MRC Purchase MMMC \$FIC

Clocking Period On-Off Control Add'l: $1940 $ 5 $ 69 $.50 $15
Day-of-Week Read-out, 24/26/1034 3219 10 434 3.50 54
Digital Time Read-out Control 24/26/1034 3257 10 488 .50 21 1448 3258 37 1,615 .75 29 1029 3268 37 1,615 .75 29 2702 3273 48 1,700 1.25 78

1033 PRINTER

Purpose: Output page printer for 1030 Data Collection Systems used online with a data processing system via a 1026/1448 Transmission Control Unit, 2701 Data Adapter Unit, or 2702/2703 Transmission Control.

Highlights: A compact industrial unit which can be mounted on a wall or on a free standing pedestal. Note: Wall brackets or pedestals are not included with the unit. Pedestals are available from outside vendors or from IBM. ... see SRL GA24-3021 for pedestal specifications.

The printer is controlled by the data processing system through the 1033 Printer Attachment (#1279) on a 1031 Input Station A model. Addressing is performed by programming in the processor. Remote inquiries for print-out initiate from a card reader, badge reader, or manual entry of an associated 1031 A or B model. Data is transmitted to the printer at 14.8 cps. The printer operates in downshift mode ... prints 28 letters, 10 digits and 8 special characters) and a removable Processor Printing Element -- see "Type Catalog"... horizontal spacing is 10 characters/inch ... roll paper is led by a 15" friction feed solid platen with a 13" print line. Ribbons are available through the OP division or outside vendors. Note: For unattended operation or multi-part (up to 5) form paper, a Pin Feed Platen is required ... see "Special Features."

System Checking -- each character received by the printer must contain an odd number of bits. A 6-bit BCD code plus a parity bit and a start and stop bit (total of nine bits) is used. Parity checking of each character is performed by the receiving 1031 Ind. A.

PREREQUISITES: A 1033 Printer Attachment (#1279) on a 1031 mdli A ... Attachment Feature - 1030 (#1274) and Attachment Feature - 1033 (#1277) on a 1448 for requirements for use with a 1026 or 2701, see those units.

Limitations: 1033s cannot be used in 1030 systems attached to a 1034 Card Punch ... cannot be attached to a 1031 with a Common Carrier Adapter (#2068) ... maximum of nine 1033s can be attached to a 1031 mdli A ... maximum cable length (1033 to 1031 mdli A) is 3,000' ... see SRL GA24-3021 for detailed information.

Environment: See 1030 in "Systems."


[5] Printing Element: #9575 for Processor - Standard, or #9579 for Processor - "H" Option ... see "Type Catalog."

PRICES: Mdli MRC Purchase MMMC

MAC/ MRC 1034 1 $404 $16,580 $ 37.00

Plan Offering: Plan B Purchase Option: 50% Maintenance: C Warranty: B Per Call: 1

ACCESSORY FEATURE

PIN FEED PLATEN (#9509). [Purchase Only] For Plant Installation -- specify #9509. Maximum one, in lieu of standard friction feed platen. See "Pin Feed Platens" on Mdli 10000 pages for available options, feature #a to be specified and price. For Field Installation -- to order add’l platens, or to order one for field installation.

1034 CARD PUNCH

Purpose: Output card punch for data transmission from 1031 Input Stations and 1035 Badge Readers in a 1030 Data Collection System.

Specifications: See 1030 in "Systems." This unit has a 1,200-card capacity hopper and a 1,300-card capacity stacker. Interlocks stop machine operation when the hopper becomes empty. If the stacker is full, a card jams, or transmission is interrupted, an audible alarm signals the operator.

Control Capabilities -- each 1034 can pull up to twenty-four 1031s on each of two lines with a maximum of two lines possible. A mixture of 1031 mdli A and B or As can be attached to each line. However, only 1031 mdli A can be connected directly to the 2-wire communication line leading to the 1034. See 1031 for allowable ratios of 1031 mdli As and Bs and SRL GA24-3021 for communication line specifications.

Use with 1035s -- 1035 Receive Control (#7963) is required when 1035 Badge Readers are used in the system. Also review Variable Record Length (#8695) and Pack Card Column Counter (#5491) under "Special Features."

Limitation: 1033 Printers cannot be attached to 1031 mdli As which transmit to a 1034.

Environment: See 1030 in "Systems."


SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9880 for 115 V, locking plug, or #9881 for 115 V, non-lock plug. NOTE: Two 20', 2-wire main line signal cables are shipped automatically. [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

PRICES: Mdli MRC Purchase MMMC

MAC/ MRC 1034 1 $404 $16,580 $ 37.00

Plan Offering: Plan B Purchase Option: 50% Maintenance: C Warranty: B Per Call: 1

SPECIAL FEATURES

COMMON CARRIER ADAPTER (#2068). Provides for long distance data transmission via external data sets over 4-wire full duplex communication lines provided by a common carrier. Transmission rate is 60 cps/600 bps. Local 2-wire capabilities of standard machine are not affected by installation of this feature. Specify: For cable assembly from 1034 to external data set, #9021 and quantity (length in feet) ... maximum length with Line Trimmer (#4835) installed is 20', without #4835, maximum length is 40'. Limitation: Cannot be installed with IBM Line Adapter (#4647).

DAY-OF-WEEK READ-IN (#3200). Required if Day-of-Week Read-out (#3219) is installed on a 1032 ... see 1032. Prerequisites: Digital Time Read-in (#3268).

DIGITAL TIME READ-IN (#3268). Required to attach a 1032 Digital Time Unit for time read-in to the 1034 ... a 15' cable (1034 to 1032 or adjacent 1034) is furnished.

† For further information on IBM Line Adapters, see M 2700. ** SRL OA4-3415-2, or subsequent revisions.
1034 Card Punch (cont'd)  

IBM LINE ADAPTER (#4647). A modem for unlimited distance use with standard or country commonly used lines or privately owned communication facilities. For line specifications, see RSL GA24-3435**. When this feature is installed, the standard card wire is not expected to exceed 6 mile and the modem can also be used. Limitations: Cannot be installed with Common Carrier Adapter (#2068) ... all 1031s connected through this feature must have their addressing facility enabled at the beginning of the polling list (B, C, D, etc.) ... a 1034 used for backup of another 1034 equipped with this feature must also have this feature.

LINE TRANSFER (#4835). Provides the ability to transfer automatically the communication line or lines from the normal channel of a 1034 to the backup channel of an adjacent operating 1034. If the reader requires the Common Carrier Adapter (#2068) for normal operation, the card punch assigned to back up this unit must also have #2068 installed. Limitations: Up to three 1034s in a given installation can be connected in a backup configuration. However, only a single punch can be assigned to back up any one other punch ... for systems using common carrier data sets, the length of the line from the data set to the 1034 must not exceed 20'. A 16' inter-machine cable is provided. Prerequisites: All 1034s connected in an automatic backup configuration must be equipped with #4835.

PACKED CARD COLUMN COUNTER (#5491). Provides better packing of records punched in output card when 1035 Badge Readers are used in the system and the 1034 is operating in packet mode. Also provides the ability to punch two record types (two transaction codes) in the packed card mode. The feature effectively counts card columns punched in the output card and feeds a new card when insufficient columns remain to punch a maximum length record. Transaction codes and counter column count are wired at installation as specified by the customer. Prerequisites: Digital Time Read-in (1963), Packed Card (5490), and Digital Time Read-in (#3266).

SELECTIVE STACKER (#6408). An additional stacker which may be used to select cards containing a specific transaction error or error indication:

1035 RECEIVE CONTROL (#7963). Required when 1035 Badge Readers are used in a 1030 system. Provides immediate repolling of an address when an error is detected by the 1034.

VARIABLE RECORD LENGTH (#8985). Provides record length checking for variable length records received under the same transaction code. Required when data is received from 1035 Badge Readers and the record length varies in increments of either 4, 5, 6, 7, 8, 9, 10 or 11 characters. Wired at installation for a single transaction code and increment specified by customer. Note: Increment used is equal to number of columns read from a single badge, plus ... for an increment of 8 (7-column record), the standard modulus 8 feature is used. Prerequisites: 1035 Receive Control (#7963).

### Special Feature Prices:

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<thead>
<tr>
<th>Feature</th>
<th>MAC/</th>
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### 1035 BADGE READER

**Purpose:** An input station for a 1030 Data Collection System or a 2790 Data Communication System. Used to transmit numeric data read from badges via a 1031 Input Station or a 2791 Area Station mdl 1 to a central collection point.

**Specifications:** A small industrial unit which can be wall or shelf-mounted. Simple in operation, the 1035 reads identification badges (22-column punch card size) pre-punched in IBM card code, with a maximum of ten numeric digits. See RSL GA21-9028 for badge specifications.

For 1030 Systems — up to four 1035s can be connected to any A or B model 1031 via a common multi-wire cable not exceeding 1,000 feet. Cable connections are made via customer-provided junction boxes and cables, except for the IBM-provided 4 foot attachment cable to the junction box ... see "Specify." See Physical Planning Manual, GA24-3021 for details.

Functionally, 1035s can be thought of as additional columna of badge reading which are located remotely from the 1031 with their associated 1030. Prerequisites: 1030 (with which they are associated). When the 1031 is polled, all badge readers (including the one in the 1030) are scanned sequentially and transmit as a block of data. Empty badge readers are scanned in sequence, but no data is transmitted. Thus, a transmitted block of data will vary in length, depending upon the number of badge readers ready when the 1031 is polled. If no badge readers are ready when the 1031 is polled, no data is transmitted. Each record in a transmitted block (up to a total of five) is automatically preceded by a character identifying the badge reader. From a user point of view, the 1035 operates in a manner identical to a 1031 mdl A6 or B6. An inserted badge is locked in position, read, and automatically released.

For 2790 Systems — up to three 1035s can be connected to any 2791 mdl 1 via a common multi-wire cable not exceeding 1,000 feet. Cable connections are made via customer-provided junction boxes and cables, except for the IBM-provided 4 foot cable to the junction box ... see "Specify." See Physical Planning Manual GA27-3017 for details.

**Operator Controls:** A Repeat light indicates a detected transmission error. A Clear button is provided to turn off the Repeat light and to release the badge.

**Customer Responsibilities:** See M 2700 pages.

**PREREQUISITES:**

For 1030 — [1] 1035 Attachment (#7961) on the associated 1031 ... [2] 1035 Control (#7961) on a 1031 mdl A equipped with #7961 and/or which controls 1031 mdl B equipped with #7961 ... [3] 1035 Receive Control (#7963) on the 1034 Card Punch for offline systems. [4] Variable Record Length (#8695) on the 1034 if the number of columns read per badge is 2, 3, 4, 5, 6, 7, 8, 9 or 10. For 7 digits of badge (plus 1 for station number), the standard modulus 8 checking in the 1034 surfs.

For 2790 — a 2791 mdl 1 equipped with 1035 Attachment (#8030).

**Limitations:**

For 1030 — [1] The maximum cable distance from the farthest 1035 to its associated 1031 is 1,000 feet; total aggregate cable length connecting 1035s to their associated 1031 cannot exceed 2,000 feet; the total cable distance from the farthest 1035 via its associated 1031 to the controlling 1031 mdl A cannot exceed 3,000 feet. For details refer to SRL GA24-3021 ... [2] The number of 1035s attached to a 1031 cannot exceed four ... [3] The number of badge columns read from each 1035 (and associated 1031 if equipped with a badge reader and operating in badge mode) must be equal ... [4] The number of badge columns read in any badge reader cannot exceed ten ... [5] The total number of badge columns transmitted in one block cannot exceed 30. Thus, with five badge readers (one 1031 and four 1035s) the maximum number of columns read from each badge is six; with four badge readers — seven; with three badge readers or less — ten.

For 2790 — [1] The maximum cable distance from the farthest 1035 to its associated 2791 mdl 1 is 1,000 feet ... [2] The number of 1035s attached to a 2791 mdl 1 cannot exceed three.

**Environment:** See 1030 or 2790 in "Systems."

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1821.

**SPECIFY:** [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz); #9880 for locking plug, or #9881 for non-lock plug.

**[2] Color:** #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

**[3] Cable to Junction Box:** #9410, if required. A 4-wire cable from the 1035 to a customer-provided junction box ... see Physical Planning Manual GA24-3021 or GA27-3017 for requirements.

**Note:** If #9410 is specified, provide complete person's name and address for shipment details. 4-wire cables will be shipped automatically, approximately 30 days prior to scheduled delivery.

**PRICES:**

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</table>

**Plan Offering:** Plan B Purchase Option: 45% Maintenance: C Warranty: B Per Cal 1

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1071 TERMINAL CONTROL

Purpose: Control unit for a 1070 Process Communication System.

Model 1 Used for 14.8 cps transmission.

Model 2 Used for 66.6 cps transmission.

Model Changes: Can be made in the field.

Highlights: A 1071 is required in each system ... it controls selection and conversion depends upon the 1071 model.

Supplies the line control governing data transmission and checks all transmitted and received data for validity. NOTE: For communications facilities and attachment to communications lines, see 1070 in "Systems."

The basic 1071 contains logic for addressing 50 input/output points. This capacity can be expanded to 300 points, in modules of 50 ... see "Special Features." Performs contact sense, decimal and BCD input, and contact operate functions. Process alert logic forms the associated processor of interrupt requests ... see "Special Features" for extended input/output functions.

A compact unit designed for industrial environments, it can be mounted in standard 19’’ relay racks ... racks are available from outside vendors.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage (AC, 1-phase, 60 Hz, locking plug) #9880 for 115 V. $9884 for 208 V. or $9886 for 230 V, unless DC Power 1071-217, 3217) is ordered.

[2] Data Set Attachment: One of the following, depending upon the data set to be used -- #9110 or #9111 for facility D1, #9110 for facility D2, #9112 for the IBM Line Adapter (#4792). See the D1M and D2M facilities in the M 2700 pages for applicability of these codes.

[3] Cables: Use 1070 Cable Order Form -- (a) length of cable to data set ... (b) length of Digital Input Channel cable, Display Attachment cable and Printer Attachment cable, when purchased from IBM. NOTE: The three cables after (b) are special cables, purchased at $1.90 per foot and installed by the customer. Completed cable order form must be received at least 90 days prior to installation date.

[4] When 1070 terminals are controlled by a 1050 system as a master station, consult for special requirements.

PRICES: Mdl MAC/ MRC Purchase MMMC
1071 1 2 $199 $6,775 $23
2 212 7,190 23
Plan Offering: Plan B Purchase Option: 60% Maintenance: B Warranty: B Per Call: 2

SPECIAL FEATURES
ADD’L ADDRESSING MODULE (#1048). Adds 50 addresses to the 1071’s addressing range. One feature is required for each 1072 Terminal Multiplexer added after the first one. Maximum: Five.

ANALOG-TO-DIGITAL CONVERTER (#1262). Converts analog input signals, full scale range -1 to +5 V, to their equivalent 3-digit values. Conversion rate is approximately 2/second for 1071 mdl 1, 20/second for mdl 2.

ADC EXTENDED RESOLUTION (#1263). Increases Analog-to-Digital Converter (#1262) resolution from 0.1% to 0.025% of full scale range for improved analog conversion accuracy.

DC POWER SUPPLY ADAPTER (#3217, 3218). For operation of the 1071 from +12 to +24 V DC power to permit use with back-up battery power. #3217 -- for +24 V ... #3218 -- for +12 V.

DISPLAY ATTACHMENT (#3345). Converts output data into decimal "one-out-of-ten" code for attachment of 1074 Binary Display, 1075 Decimal Displays, and customer’s decimal output devices to the 1071 ... also required for 1073 mlds 1 and 2.

† LINE ADAPTER (#4792). For attachment to customer-owned or leased telephone cable facilities for in-plant operation ... not exceeding 8 wires/miles.

MULTI-CHARACTER INPUT (#5185). Extends basic 1071 digital input capability to include extended BCD code (B, A, 8, 4, 2, 1, C) and externally synchronized multi-character input devices ... for further information on IBM Line Adapters, see M 2700 pages.

1072 TERMINAL MULTIPLEXER

Purpose: Unit for addressing and terminating up to 50 input/output points ... analog inputs, decimal "one-out-of-ten" inputs, BCD and extended BCD inputs, contact sense inputs, or digital output/contact operate points in a 1070 system.

Highlights: Every 1070 system has at least one 1072 ... up to six can be connected to the 1071 Terminal Control for a total of 300 input/output points ... I/O points are installed in groups of ten (see "Special Features"). Each 1072 is cabled separately to the 1071 for maximum installation flexibility ... the unit is designed for mounting in a standard 19’’ relay rack.

PREREQUISITES: A 1071 mdl 1 or 2, plus one Add’l Addressing Module (#1048) on the 1071 for each 1072 attached after the first one.

Maximum: Six per system.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] I/O Switching Module(s) (#4463) -- see "Special Features." NOTE: No function is provided unless one or more I/O Switching Modules (#4463) is specified.

[2] Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of address cable (1072-1071) for each 1072 ordering ... (b) length of Analog Signal cable (1072-1071), required for each 1072 terminating analog input signals. NOTE: Address cable is a special cable, purchased at $1.90 per foot and installed by the customer. Analog Signal cable is a special cable, purchased at $2.5 per foot and installed by the customer.

PRICES: Mdl MAC/ MRC Purchase MMMC
1072 1 2 $10 $476 $ .50
Plan Offering: Plan B Purchase Option: 55% Maintenance: C Warranty: B Per Call: 2

SPECIAL FEATURES
I/O SWITCHING MODULE (#4463). A multiplexer card for selection and termination of up to ten customer input or output points ... each module is assigned to any one of the following functions at time of installation:

Analog Input -- for selection of up to ten analog input points in any one of the following four ranges ... -1 to +5 V, -10 to +50 millivols, -20 to +100 millivols, or -100 to +500 millivols. Note: ADC calibration requires two addresses of lowest analog input range and one address of each additional analog input range.

Digital Input -- for selection of up to ten contact sense, decimal or BCD inputs in any combination.

Digital Output -- for selection of up to ten contact operate points, display devices, or output printers in any combination.

Maximum: Five per 1072.

THERMOCOUPLE BLOCK (#7940). Provides an isothermal block and resistance bulb thermometer to measure "cold junction" thermocouple termination temperature. Each 1072 having thermocouple inputs must have a #7940. Note: Two analog input addresses, -10
### 1072 Terminal Multiplexer (cont'd)

To +50 millivolt range, are required to read the thermocouple block temperature. Maximum: One. **Prerequisites: Analog-to-Digital Converter (#1262) and Range Select (#5960) on the 1071, plus at least one I/O Switching Module (#4663) on the 1072.**

**Special Feature Prices:**

<table>
<thead>
<tr>
<th>I/O Switching Module #4663</th>
<th>MAC/ MRC Purchase</th>
<th>MMMC/FIC</th>
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<tbody>
<tr>
<td>$6</td>
<td>$211</td>
<td>$.50</td>
</tr>
</tbody>
</table>

Thermocouple Block 7940 10 423 $.50 12

### 1073 Latching Contact Operate - Model 1

[No longer available ... orders are on an "as available" basis]

**Purpose:** Unit for control and termination of up to 40 latching contact operate points in a 1070 Process Communication System.

**Highlights:** Each latching contact operate point is individually addressable and provides control of contact status (operating customer’s devices) for any desired time period as determined by the processor program ... latching contact operate points are ordered in groups of two (see "Special Features"). Designed for mounting in standard 19” relay racks.

**PREREQUISITES:** Display Attachment (#3345) on the 1071, plus one or more I/O Switching Modules (#4663) on one or more 1072s ... each latching contact operate point uses one address assigned to Digital Output in an I/O Switching Module.

**Maximum:** Depends upon number of available addresses in I/O Switching Modules (#4663) on 1072s.

**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.

**Specify:** Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1073-1072), a second Address cable is required if more than 20 L.C.O. points are installed in the 1073 mdl 1, and (b) length of Data Cable (1073-junction with Display Attachment cable) for each 1073 mdl 1 ordered. **NOTE:** Address cable and Data cable are special cables, purchased at $1.90 and $1.15 per foot respectively and installed by the customer.

**PRICES:** Mdl 1073

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<tr>
<td>Warranty: B</td>
<td>Per Call: 2</td>
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</table>

### Special Features

Latching Contact Operate Points (#4781). A group of two points for terminating outputs to customer devices. Output is one relay contact per point, rated at 100 Volt Amps, with a 1-amp non-inductive maximum current. **Maximum:** Twenty per 1073 (40 points).

**Special Feature Prices:**

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<td>$184</td>
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### 1073 Digital-Pulse Converter - Model 3

[No longer available ... orders are on an "as available" basis]

**Purpose:** Unit for buffered pulse or pulse duration output in a 1070 Process Communication System.

**Highlights:** Accepts a three digit value (000-999) from the 1071 ... when the “execute circuit” is activated, the digital value is converted into an equal number of contact closures of proportional contact closure duration ... optional read back check before execute” command ... executes interlock during “execute” prevents readdressing ... before conversion is complete ... pulse output rate of 90 pulses per second ... output multiplexing via L.C.O. points in a 1073 mdl 1. Designed for mounting in standard 19” relay racks ... the standard unit operates from a 12 V DC power source to facilitate use with backup battery power.

**PREREQUISITES:** Display Attachment (#3345) on the 1071, plus available I/O Switching Module (#4663) addresses on a 1072 ... each 1073 mdl 3 uses four 1072 addresses assigned to Digital Output.

**Maximum:** Depends upon number of available addresses in I/O Switching Modules (#4663) on 1072s.

**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.

**Specify:** Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1073-1072), (b) length of Data cable (1073-junction with Display Attachment cable), and, if required, (c) length of Data cable (1073-junction with Digital Input Channel cable) for each 1073 mdl 3 ordered. **NOTE:** Address cable is a special cable, purchased at $1.15 per foot and installed by the customer. Data cables are special cables, purchased at $1.90 per foot and installed by the customer.

**PRICES:** Mdl 1073

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<td>Warranty: B</td>
<td>Per Call: 2</td>
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</table>

### 1073 Counter Terminal - Model 2

[No longer available ... orders are on an "as available" basis]

**Purpose:** Unit for terminating pulse input points and/or pulse duration input points in a 1078 Pulse Counter ... each unit has a maximum capacity of 60 points.

**Highlights:** Input points may be customer contact or voltage source ... input points are ordered in groups of ten (see "Special Features"). Designed for mounting in standard 19” relay rack ... connected to 1078 via special cable (up to 10’) furnished by IBM.

**PREREQUISITES:** A 1078, plus one Counters, Group of Ten (#2410) for each group of ten input terminations.

**Maximum:** Three per 1078.

**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.

**Specify:** Cable: Use 1070 Cable Order Form -- length of cable between 1073 mdl 2 and 1078.

### Special Features

**AC POWER SUPPLY (#8680, #8684, #8686).** For operation from one of the following 1-phase, 60 Hz power sources -- #8680 for 115 V, #8684 for 208 V, or #8686 for 230 V. (Locking plugs).

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1073 Digital-Pulse Converter - Model 3 (cont'd)

EXTERNAL OUTPUT CONTROL (#3864). Enables the 1073 mdl 3 to control the duration of an externally synchronized operation ... i.e., proportional blending systems, fluid delivery systems, etc. Enabled with a 1070 Process Communication System and a 1073 mdl 3 output register to zero ... 1073 Latching Contact Operate Points (#4781) provide program control of External Output Control use.

VARIABLE OUTPUT SPEED (#8675). Provides program control of selection of one of the following output rates -- 96, 48, 24, 12, 6, 3, 1.5 or 0.75 pulses per second. Note: Requires one additional 1072 address assigned to Digital Output.

**MAC/ Special Feature Prices:**

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<td>230 V</td>
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<td>Variable Output Speed #8675</td>
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</table>

1074 BINARY DISPLAY

[No longer available ... orders are on an "as available" basis]

**Purpose:** Unit for display of process on-off conditions and other on-off information received from the data processing system associated with a 1070 Process Communication System.

**Highlights:** Has ten pairs of lamps for display of on-off conditions ... each pair of lamps (one green, one amber) is individually addressable ... can be set -- green on, amber on, or both on ... error lamp lights when 1071 detects improper data transmission ... each switch position and the execute button uses the backup battery power.

**PREREQUISITES:** Display Attachment (#3345) on the 1071, plus available I/O Switching Module (#4663) addresses on a 1072 ... each pair of lamps uses one address assigned to Digital Output in an I/O Switching Module.

**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.

**Specify:** Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1074-1072) and (b) length of Data cable (1074-junction with Display Attachment cable) for each 1074 ordered. NOTE: Address cable is a special cable, purchased at $1.15 per foot and installed by the customer. Data cable is a special cable, purchased at $1.90 per foot and installed by the customer.

**PRICES:**

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<td>WARRANTY: B</td>
<td>Per Call: 2</td>
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</table>

**SPECIAL FEATURES**

**AC POWER SUPPLY (#8680, 8684, 8686).** For operation from one of the following 1-phase, 60 Hz power sources -- #8680 for 115 V, #8684 for 208 V, or #8686 for 230 V AC. (Locking plugs)

**ADDITIONAL DISPLAY MODULE (#3348).** Four additional display positions. Note: Requires four additional addresses assigned to Digital Output in an I/O Switching Module.

**MAC/ Special Feature Prices:**

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<td>208 V</td>
<td>8684</td>
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<tr>
<td>230 V</td>
<td>8686</td>
<td>16</td>
<td>689</td>
<td>1.50</td>
</tr>
<tr>
<td>Add'l Display Module 3348</td>
<td>38</td>
<td>1,485</td>
<td>3.00</td>
<td>26</td>
</tr>
</tbody>
</table>

1076 MANUAL BINARY INPUT

[No longer available ... orders are on an "as available" basis]

**Purpose:** Unit for operator entry of on-off conditions to a data processing system associated with a 1070 Process Communication System.

**Highlights:** Has ten 2-position switches for entry of on-off data ... each switch is individually addressable ... position of switch remains as last set ... each switch position may be labeled by the customer ... an execute button requests associated processor attention ... an execute lamp informs the operator that a transaction has been completed.

**PREREQUISITE:** Available I/O Switching Module (#4663) addresses on a 1072 ... each switch position and the execute button uses one address assigned to Digital Input in an I/O Switching Module.

**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.

**Specify:** Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1076-1072) and (b) length of Data cable (1076-junction with Digital Input Channel cable) for each 1076 ordered. Note: Address cable is a special cable, purchased at $1.15 per foot and installed by the customer. Data cable is a special cable, purchased at $1.90 per foot and installed by the customer.

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1076</td>
<td>1</td>
<td>$ 29</td>
<td>$1,120</td>
<td>$3.50</td>
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<tr>
<td>Plan Offering: Plan B</td>
<td>Purchase Option: 50% Maintenance: C</td>
<td>WARRANTY: B</td>
<td>Per Call: 2</td>
<td></td>
</tr>
</tbody>
</table>

1075 DECIMAL DISPLAY

[No longer available ... orders are on an "as available" basis]

**Purpose:** Unit for display of decimal information received from a data processing system associated with a 1070 Process Communication System.

**Highlights:** Displays four decimal digits as determined by the data processing system ... each digit is individually addressable ... four additional digits can be added (see "Special Features").

An error lamp indicates improper data received by the 1071 ... each display position may be labeled by the customer ... the standard unit operates from a 12 V DC power source to facilitate use with backup battery power.

**PREREQUISITES:** Display Attachment (#3345) on the 1071, plus available I/O Switching Module (#4663) addresses on a 1072 ... each display position uses one address assigned to Digital Output in an I/O Switching Module.

**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.

**Specify:** Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1075-1072) and (b) length of Data cable (1075-junction with Display Attachment cable) for each 1075 ordered. Note: Address cable is a special cable, purchased at $1.15 per foot and installed by the customer. Data cable is a special cable, purchased at $1.90 per foot and installed by the customer.

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1075</td>
<td>1</td>
<td>$ 68</td>
<td>$2,615</td>
<td>$6.00</td>
</tr>
<tr>
<td>Plan Offering: Plan B</td>
<td>Purchase Option: 60% Maintenance: C</td>
<td>WARRANTY: B</td>
<td>Per Call: 2</td>
<td></td>
</tr>
</tbody>
</table>

**ADDITIONAL DISPLAY MODULE (#3348).** Four additional display positions. Note: Requires four additional addresses assigned to Digital Output in an I/O Switching Module.

**MAC/ Special Feature Prices:**

<table>
<thead>
<tr>
<th>AC Power Supply</th>
<th>MRC</th>
<th>Purchase</th>
<th>MMMMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>115 V</td>
<td>#8680</td>
<td>$ 16</td>
<td>$ 689</td>
<td>$1.50</td>
</tr>
<tr>
<td>208 V</td>
<td>8684</td>
<td>15</td>
<td>689</td>
<td>1.50</td>
</tr>
<tr>
<td>230 V</td>
<td>8686</td>
<td>15</td>
<td>689</td>
<td>1.50</td>
</tr>
<tr>
<td>Add'l Display Module 3348</td>
<td>38</td>
<td>1,485</td>
<td>3.00</td>
<td>26</td>
</tr>
</tbody>
</table>

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1077 MANUAL DECIMAL INPUT

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for operator entry of decimal data to a data processing system associated with a 1070 Process Communication System.

Highlights: Has six switches for entry of six decimal digits of information ... each switch position may be labeled by the customer ... an execute button requests associated processor attention ... an execute lamp informs the operator that a transaction has been completed.

PREREQUISITE: Available I/O Switching Module (#4663) addresses on a 1070 circuit switch position and the execute button uses one address assigned to Digital Input in an I/O Switching Module.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Cables (when ordered from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1077-1072) and (b) length of Data cable (1077-junction with Digital Input Channel cable) for each 1077 ordered. Note: Address cable is a special cable, purchased at $1.15 per foot and installed by the customer. Data cable is a special cable, purchased at $1.90 per foot and installed by the customer.

1078 PULSE COUNTER

[No longer available ... orders are on an "as available" basis]

Purpose: Unit for counting events or rates represented by pulses or switch closures up to 180 customer input devices in a 1070 Process Communication System.

Highlights: Provides for up to 180 five-position pulse counters ... pulse duration of up to 30 second ... continuous parity checking of each counter position ... up to 18 (6 standard) scan groups provide variable length readout control ... pulse duration and telemetered pulse duration options with selectable resolution ... counters are ordered in groups of ten ... counters may be read by the system in predetermined groups, or Read and/or Reset using programmable addressing for greater flexibility ... see "Special Features."

PREREQUISITES: Multi-character Input (#5185) on the 1071, plus available I/O Switching Module (#4663) addresses on a 1072 ... each 1078 using one 1072 address assigned to Digital Input and at least one 1072/1073 in which Input Terminations are ordered as special features.

Maximum: Depends upon number of available addresses in 1/I Switching Modules (#4663) on 1072s.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9880 for 115 V. #9884 for 208 V. or #9886 for 230 V, unless DC Power Supply Adapter (#3217, 3218) is ordered ... see "Special Features."

[2] Cables (when purchased from IBM): Use 1070 Cable Order Form -- (a) length of Address cable (1078-1072) ... (b) length of Data cable (1078-junction with Digital Input Channel cable) ... (c) length of second Data cable if Selective Read/Reset (#6050) and/or Consecutive Read/Reset (#6051) are ordered (1078-junction with Display Attachment Features cable) for each 1078. Note: Address cable and Data cable are special cables, purchased at $1.90 per foot and installed by customer.

PRICES: Mdl | MAC/ MRC | Purchase | MMMC | FIC
--- | --- | --- | --- | ---
1077 | 1 | $31 | $1,185 | $3.50

Plan Offering: Plan B Purchase Option: 50% Maintenance: C Per Call: 2

Warranty: B

Special Feature Prices:

MAC/ MRC | Purchase | MMMC | FIC
--- | --- | --- | ---
Counters, group of 10 #2410 | $5 | $169 | $25 | $4
DC Power Supply Adapter for +24 volts | 3217 | 10 | 423 | 1.50 | 55
for +12 volts | 3218 | 10 | 423 | 1.50 | 55
Pulse Duration 5868 | 10 | 423 | 1.50 | 55
Pulse Duration, Timly 5869 | 10 | 343 | 25 | 18
Read/Reset, Selective 6050 | 31 | 1,025 | 1.50 | 5
Read/Reset, Consec 6051 | 11 | 465 | .25 | 3
Scan Grps, module of 6 6370 | 5 | 204 | .25 | 9

Pulse Duration -- accumulates duration of input pulses or switch closures at a resolution of 107 or 10.7 pulses per second.

Note: Pulse Duration (#5868) is required to use this mode.

Resolution is assigned at time of installation ... each pulse duration telemetry input uses two 5-position pulse counters.

Maximum: 18 per 1078, counter groups may be assigned to the three input modes in any combination.

DC POWER SUPPLY ADAPTER (#3217, 3218). For operation of the 1078 from +12 or +24 V DC power to permit use with backup battery power. #3217 -- for +24 V ... #3218 -- for +12 V. FIT: 1 hr.

PULSE DURATION (#5868). Causes all counter groups assigned to the pulse duration mode to accumulate 107 or 10.7 counts per second during the time corresponding customer inputs are actuated. Either counting rate (107 or 10.7 counts/second) is selected for all pulse duration counters at time of installation.

PULSE DURATION TELEMETRY (#5869). Causes all counter groups assigned to the pulse duration telemetry mode to accumulate, alternately in two consecutive counts, 107 or 10.7 counts per second during the time corresponding customer inputs are actuated. Counting rate depends upon Pulse Duration (#5868) setting. Each counter is limited to 4 digits with this feature, the fifth position is used as a flag. Prerequisite: Pulse Duration (#5868).

READ/RESET, SELECTIVE (#6050). For selecting a single pulse counter to request either a readout or a reset operation. Provides access to the 3-digit counter address register (1000 to 179) and a 1-digit function control register in the 1078. A control digit "2" sent to the function control register will reset the counter specified in the counter address register. No control digit is required for a readout operation. The possible 4-digit output control messages require four 1072 addresses assigned to Digital Output mode and the Display Attachment (#3345) on the 1071. Input data from the 1078 is accepted via a 1072 address assigned to Digital Input mode. Prerequisites: Display Attachment (#3345) on the 1071 and five 1072 addresses, four assigned to Digital Output and one to Digital Input.

READ/RESET, CONSECUTIVE (#6051). Used in conjunction with Selective Read/Reset (#6050) to permit program addressable groups of pulse counters to be read or reset. Provides access to the 3-digit "Stop" address register to receive an ending pulse counter address which stops the operation after its initiation at the Selective Read/Reset start address. Two additional functions are added to the function control register ... a "1" digit establishes the consecutive readout mode for the next read operation only ... a "4" digit resets those counters specified, from the start address through the stop address. Prerequisites: Selective Input/Read (#6050) and three 1072 addresses assigned to Digital Output.

SCAN GROUPS (#6370). A module of six groups which provide variable length readout of 1078 counters. Each scan group defines a start and stop address selected at time of installation ... basic 1078 includes six Scan Groups. Maximum: Two ... 12 additional Scan Groups. Prerequisite: One 1072 address assigned to Digital Input for each Scan Group.

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**1201 PROOF INSCRIBER**

**Purpose:** Performs all functions, except subtraction, of an 803 Proof Machine... plus document inscribing.

**Models:** Models with or without endorsing and various pocket capacities are available, as follows:

<table>
<thead>
<tr>
<th>Number of Pockets</th>
<th>Endorsing</th>
<th>Operative</th>
<th>Inoperative</th>
<th>Selector Key Arrangement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>1-2-4</td>
<td>1-24</td>
<td>1-16</td>
</tr>
<tr>
<td></td>
<td>B1</td>
<td>2</td>
<td>2-17-32</td>
<td>2-8 or 2-2 rows of 6,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>plus 1 row of 4</td>
</tr>
<tr>
<td></td>
<td>B2</td>
<td>3</td>
<td>2-17-32</td>
<td>2 rows of 8, or 2 rows</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>of 2 rows of 6,</td>
</tr>
<tr>
<td></td>
<td>B3</td>
<td>4</td>
<td>2</td>
<td>with 1 row of 4</td>
</tr>
</tbody>
</table>

**Model Changes:** Changes from endorsing to non-endorsing models, and vice versa, can be made between the following models: 1 and 2... A1 and A2... 1 and B2... 3 and 4... 3 and B3. For other changes, see Branch Manager Letter 34B.

**Highlights:** List, distribute, prove, inscribe, and (mdls 1 and 3) endorse checks, deposit slips, batch control slips and similar documents in one operation. Each pocket holds about 150 documents. See 803 for proof machine functions. Intermixed card and paper documents within the following specifications can be inscribed: Length — 6" to 8-3/4" (paper) or 4.852" to 8-3/4" (card). Width — 2-3/4" to 3-2/3"... Thickness — .003" to .007".

**Inscribing**—recommendations of the American Bankers Association are used. Two fields can be inscribed in magnetic ink on face of documents in a 1/4" band parallel to and 3/16" up from bottom edge. Spaced 8 characters/inch, starting approximately 5/16" from right edge. Type font is E13B. Fields are, from right to left: Amount — set up on adding keyboard and inscribed as ten digits bracketed by amount symbol... Process Control — established by setting levers mounted in top cover of machine and inscribed adjacent to amount. Used to identify types of transactions or batches of work. Distribution pocket totals, as well as process control codes, can be inscribed on control slips during compartment total printing operations. NOTE: If desired, up to four process control positions are supplied at no charge... see "Specify." 

**Endorsing** — endorsing models can endorse documents with date, identification numbers and bank's legal endorsement. The Endorser Plate is made to the customer's specifications. See "Accessories." below. A Blank Endorser Plate is also available if only partial endorsements are required. When ordering #3792 attach Endorser Plate Specification (#3792-10A)... not required for #3793.

**Control Panel** — has hubs for Inscribe Suppress and Process Control Suppress, plus hubs for all 803 functions.

**Supplies:** Magnetic Transfer Ribbon and Endorsing Roll. Each magnetic transfer ribbon provides about 13,300 line impressions.

**Manuals:** See "IBM Marketing Publications KWIC Index," G320-1621.

**Specify:** [1] Voltage (AC, 1-phase, 60 Hz, locking plug): #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V.

**[2] Process Control:** If desired, #9190 for 1 position, #9191 for 2, #9192 for 3, or #9193 for 4... number of positions can be changed or eliminated

**[3] Endorsing (mdls 1, A1, B1, 3, B3 only):** See "Endorsing" under "Highlights.

**[4] Selector Key Arrangement:** Mdl A1, A2 — #9771 for 4 rows of 6 keys, or #9774 for 2 rows of 8 keys, or #9774 for 2 rows of 6 keys plus 1 row of 4 keys.

---

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
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</thead>
<tbody>
<tr>
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<td>$419</td>
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</tr>
<tr>
<td>B1</td>
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<tr>
<td>B2</td>
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<tr>
<td>A2</td>
<td>410</td>
<td>11,340</td>
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<tr>
<td>A3</td>
<td>372</td>
<td>11,340</td>
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<td>3</td>
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<td>372</td>
<td>9,720</td>
</tr>
<tr>
<td>B4</td>
<td>333</td>
<td>9,720</td>
</tr>
</tbody>
</table>

**Plan Offering:** Plan B... Purchase Option: 50% Maintenance: C Warranty: B... Per Call: 1

---

**SPECIAL FEATURES**

**PROCESS CONTROL, ADD'L (#5701, 5702).** Up to four digits are standard... see "Specify" above. Up to two add'l digits can be installed. #5701 — for fifth digit... #5702 — for sixth. Prerequisite: For #5701 — #9193... for #5702 — #5701.

**SPECIAL FEATURE PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>5701</td>
<td>$99.50</td>
</tr>
<tr>
<td>5702</td>
<td>506 $1.00</td>
</tr>
</tbody>
</table>

**Accessories:** The following items are available on a purchase only basis for mdls 1, A1, B1, 3 and B3 only. For shipment with machine, order the desired Feature # indicated below at the price listed in M 10000 pages.

**ENDORSER PLATE (#3792).**

**Blank Endorser Plate (#3793).**

**Note:** When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M 10000 pages for description, ordering instructions and field installation.

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Purpose: Key-operated machine for printing numerals and special symbols on checks and documents in magnetic ink ... combined with functions of an adding machine.

Highlights: Continuous high-speed proving possible with a 10-key electric adding machine which prints individual amounts and totals on a paper tape. At the same time, document can be inscribed on an amount field, a process control field, and be fully or partially endorsed and serial numbered. See Serial Numbering/Endorsing (#3791) under "Special Features."

Speed depends upon operator and type of work processed. Has one stacker and one 10-position net balance accumulator which accumulates 11-position totals. Storage space for documents which cannot be processed. Intermixed card and paper documents within the following specifications can be inscribed: Length -- 6" to 8-3/4" (paper) or 4.852" to 8-3/4" (card) ... Width -- 2-3/4" to 3-2/3" ... Thickness -- .003" to .007".

Inscribing -- recommendations of American Bankers Association are used. Two fields can be inscribed in magnetic ink on face of documents in a 1/4" band parallel to and 3/16" up from bottom edge. Spaced 8 characters/inch, starting approximately 5/16" from right edge. Type font is E13B. Fields are, from right to left: Amount -- set up on adding keyboard and inscribed as ten digits bracketed by amount symbol ... Process Control -- established by setting knobs in top cover of machine, inscribed adjacent to amount field as one to four digits. Used to identify types of transactions or batches of work. Machine total and process control codes can also be inscribed on control strips during totalizing operations. NOTE: If desired, up to four process control positions are supplied at no charge ... See "Specify."

Document Counter -- a six position counter ... reset manually.


Specify: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Process Control: If desired, #9190 for 1 digit, #9191 for 2, #9192 for 3, or #9193 for 4 ... number of positions can be changed or eliminated

PRICES: Mdl MAC/ MRC Purchase MMMC 1203 1 $199 $4,140 $70
Plan Offering: Plan B Purchase Option: 50% Maintenance: C Per Call: 1

SPECIAL FEATURES
ACCOUNT NUMBER FIELD INSERBER (#1012). Inscribes a fixed-length account number and "On-Us" symbols. Field can be any one length from 5 to 10 digits, as specified by customer.

Specify: #9210 for 5 digits, #9211 for 6, #9212 for 7, #9213 for 8, #9214 for 9, or #9215 for 10.

SERIAL NUMBERING/ENDORSER (#3791). Imprints full or partial endorsement and serial number. Endorsement prints fixed distance (about 1-1/4") from bottom of document. Operator can select left or right horizontal printing position. Serial number consists of 4 automatic advancing positions separated from 2 manually-set positions by a selectable blank or dash. Serial number advance available in any one of the following options: [1] Advance one digit on credit feed (subtract key depression) ... [2] Advance one digit on zero balance test (sub-total key depression) ... [3] Advance one digit on each document feed ... [4] Advance one digit on manual key control. Advanced method will be set by CE at installation or as required subsequently by customer. With this feature, documents can be endorsed with date, identification number and bank's legal endorsement. The etched Endorser Plate is marked to the customer's specifications. See "Accessories" below. A Blank Endorser Plate is also available if only partial endorsements are required. Not to be reproduced without written permission.

M 1203 UNIT INScriBER

[No longer available ... features, RPQs and accessories are not affected.]

NON-ZERO BALANCE TEST (#3530). Depression of Sub-total key automatically locks keyboard if accumulated total is not zero.

PROCESS CONTROL, ADD'L (#5701, 5702). Up to four digits are standard ... see "Specify" above. Up to two add'l digits can be installed. #5701 -- for fourth digit ... #5702 for sixth digit. Prerequisites: For #5701 -- #1913 ... for #5702 -- #5701.

TRANSIT NUMBER FIELD INSERBER (#8202). Inscribes Transit-Routing numbers. dash and transit symbols.

MAC/ MRC Purchase MMMMC FIC
Acct No. Field Inscribe #1012 $20 $505 $2.00 $276
Serial Number/Endorse #3791 20 431 6.50 106
Non-zero Balance Test #5350 5 160 2.00 39
Process Control, Add'l first digit #5701 5 174 1.00 52
sixth digit #5702 5 174 1.00 52
Transit Number Field Inscriber #8202 20 505 3.00 316

Accessories: The following items are available on a purchase only basis. For shipment with machine, order the desired Feature # indicated below at the price listed in M 10000 pages.

Endorser Plate (#3792), Blank Endorser Plate (#3793).

NOTE: When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M 10000 pages for description, ordering instructions, and field installation.

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1230 OPTICAL MARK SCORING READER

Purpose: Used to score objective tests or questionnaires.

Highlights: Positionally marked test forms, questionnaires, surveys, etc., are automatically scored at a rated speed of 1,200 documents/hour. Scores are digitally accumulated for up to five right, wrong or omitted answers. Scores are printed on right margin of answer sheets in one of two operator selected positions.

The unit has solid state circuits. It optically reads ordinary #2 pencil marks and makes a 52- or 63-character type bar with arrangements A, H or K, a 1443 mld 1 or 2203 mld A1 with a 52- or 63-character type bar, or a 5203 Printer. The 1403/2203 print chain or train or the 1443/2203 type bar must be equipped with an enlarged dash which replaces the standard dash. See "Type Catalog." Double threshold recognition distinguishes between marks and erasures.

A correctly marked answer sheet is used to store correct responses and program controls internally. Answer sheets are fed from a pneumatically controlled hopper with a 600-sheet capacity, through the scoring area, and directed to one of two stackers. The main stacker has a capacity of 600 answer sheets. Sheets with detected errors are directed to a separate stacker with a 50-sheet capacity. Answer sheets are stacked in reverse sequence in both stackers.

Answer Sheets — 8-1/2" x 11" up to 1,000 response positions printed on a side ... 2,000 positions when printed on both sides. Preprinted response positions are printed in rows of 20 positions. Each row is divided into 10-position groups. Each 10-position group is called a word for the purpose of defining an answer area. The maximum of 100 words per answer sheet can be divided into various combinations can be used. The answer sheet can be designated for identification number as necessary to accommodate customer requirements. When an identification number is used on a two-sided answer sheet, it must be marked on both sides.

Supplies: An electric typewriter ribbon (1136238) or equivalent, is used for printing scores.

For printing marks, use IBM ribbon 1136430 or 1136940 on the 1403 (all mlds), 4225366 on the 1443/2203, 1136900* on the 5203, or equivalent ribbons capable of producing acceptable marks.

Accessory: A Hand Punch (171787) is available for punching scoring keys to manually score multilined answer sheets ... see IRD sales manual.


Specifications: [1] Voltage (115 V AC, 1-phase, 60 Hz): #9860 for locking plug, or #9861 for non-lock plug.
[2] Kickstrips: #9431 ... field installable. When kickstrips are installed, the open area under the machine is encaps... this reduces the amount of "break" between the operator and machine which may be inconvenient to the customer if the power outlet is located under the machine.

PRICES: Mdl 1

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MRC</th>
<th>MAC/</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1230</td>
<td>1</td>
<td>$238</td>
<td>$12,000</td>
<td>$46.50</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B
Purchase Option: 60% Maintenance: C
Warranty: B

Per Call: 2

SPECIAL FEATURES

CARD PUNCH ATTACHMENT (#1820). To cable-connect a 534 Card Punch mld 3 for punching identification number, part scores, and item responses into a standard 80-column card. All information to be punched is stored as bits in a sonis delay line storage unit until transferred to the card punch. The duplicating feature of the punch can be used to duplicate common data such as date, school number, test number, etc. into all the cards. Up to 42 columns of data may be punched while maintaining a throughput of 1,200 sheets/hour. Throughput decreases progressively as the number of columns punched increases. Throughput is approximately 750 sheets/hour when punching 80 columns of data. When not used with the 1230, the 534 can be used as an independent card punch ... see 534 for details.

COUNTER, FORMULA (#2398). An additional counter which can be controlled to add, subtract and transfer its contents to the standard counter. Can be programmed to accumulate Rights, Wrong, or Rights minus (N) Wrong, where N can be equal to 1, 1/2, or 3/4. Also good for counting as right answers as many responses (up to five) to a test item as have been programed as possible right answers to the item. Maximum: One. Limitation: Cannot be installed with Counter, RWO (#2399).

COUNTER, RWO (#2399). An additional counter which can be counted to control the number of Rights, or Wrong, or Omits, and transfer its contents to the standard counter. Maximum: One. Limitation: Cannot be installed with Counter, Formula (#2398).

ID FIELD CHECKING (#4609). Provides the capability of checking words in the identification field for one of the following conditions: blanks, multi-marks, or other than a mark. ID field is defined as all words programmed to read prior to first end of field mark. No scoring of test answers can take place in the ID field. Preparing for ID Field Punch (Card Punch, #2200).

STORAGE (#7457). Used as intermediate buffering device which allows the counter to be cleared immediately after completion of a part score ... permits the counter to be reused for additional scoring without sacrificing answer sheet space. Maximum: One.

1231 OPTICAL MARK PAGE READER

Purpose: Reads marked data from 8-1/2" x 11" data sheets directly into a 1401 (except A or H mlds), 1440 (except with 1441 AC), 1440 with 1231, 8/360 mld 22, 25, 30, 40 or 50.

Model Changes: Cannot be made in the field.

Highlights: Data sheets are fed from a pneumatically controlled hopper with a 600-sheet capacity, through the reading area, and directed to one of two stackers. The main stacker has a capacity of 600 answer sheets. Sheets with detected errors are directed to a separate stacker with a 50-sheet capacity. Documents are stacked in reverse sequence in both stackers.

Data to be read can be placed on data sheets with ordinary #2 pencils, or by a 1403 Printer, a 1443 Printer mld 1 or 2 with a 52- or 63-character type bar with arrangement A, H or K, a 1443 mld 1 or 2203 mld A1 with a 52- or 63-character type bar, or a 5203 Printer. The 1403/5203 print chain or train or the 1443/2203 type bar must be equipped with an enlarged dash which replaces the standard dash. See "Type Catalog."

1401, 1440, 1490 — documents are read at varying speeds, dependent upon the data switch setting. When set to "Continuous," feeding is at a constant speed of 2,000 documents/hour. When set to "Demand," feeding is controlled by computer program and speed is up to 1,600 documents/hour. The feeding mode selected depends upon the computer program control method used. The 1231 mld 1 can be located up to 25 feet from the processor.

S/360 — documents can be read at a maximum constant rate of 2,000 documents/hour. Actual throughput depends upon computer programming. Sheets are fed upon command from the computer. Data is transferred to the processor by operation of the channel to which the 1231 is attached.

Data Transmission: 1401, 1440, 1490 — all marks read from a data sheet are stored as bits in a sonis delay line storage unit until transferred to the processor by execution of a read instruction. Less than 100 milliseconds are required to transfer data from the delay line to processor storage.

S/360 — marks read from the data sheet are stored in the 1231 mld 1 by word and are transferred to the processor by operation of the channel to which the 1231 is attached.

Data Sheets — 8-1/2" x 11" ... up to 1,000 mark positions printed on a side ... 2,000 positions when printed on both sides. Preferably mark positions are printed in 8-10-position groups. Each row is divided into two 10-position groups. Each 10-position group is called a word for the purpose of defining a marking area. Each word can be divided into two 5-position segments. Data words and segments can be grouped in various combinations to form fields for recording the source data.

PREREQUISITES: For 1401, 1440, 1490 — A Serial I/O Adapter (#7080) on the 1401 or 1441 Processing Unit ... in a 1401, diagnostic programs require at least 4,000 positions of core storage.

For S/360 — up to four 1231 mld N1s can be attached to a

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1231 Optical Mark Page Reader (cont'd)

System... each requires a channel control unit position.

S/360 mdl 25 - special feature on 2025; Multiplexer Channel, or Selector Channel... see 2025.

S/360 mdl 22, 30, 40, 50 - standard multiplexer channel, or Selector Channels special features, except on 2022 or select-

channel standard) ... see 2022, 2030, 2040, 2050. [Note: If the 1231 is attached to a multiplexer channel, special con-

sideration must be given to priority.]

Limitations:

S/360 mdl 25, 30 - operation of 1231s is not included under 1401/1440/1460 Compatibility Features.

S/360 mdl 40 - operation of 1231s is not included under the 1401/1440/1460 Compatibility Feature (#4457).

Supplies: For printing marks, use IBM ribbon 1136430 or 1136440 on the 1403 (all models). 422536 on the 1443/2203,

1136990* on the 5203, or equivalent ribbons capable of produc-

ing acceptable marks.


Specify: [1] Voltage (AC, 1-Phase, 60 Hz) #9902 for 208 V, or #9904 for 230 V... must be consistent with system voltage.

[2] Color (mdl N1 only): #9041 for red, #9042 for yellow, #9043 for blue, #9044 for gray, or #9045 for white.

[3] Kickstrips: #9431 ... field installable. When kickstrips are installed, the open area under the machine is enclosed. This re-

duces the amount of '"toe-room' for the operator and may be inconvenient to the customer if the power outlet is located un-

der the machine.

[4] Iceolation Feature: May be required on units shipped prior to December 29, 1967... see "Special Features."

1231 Optical Mark Page Reader
Purpose... reads marked data from 8-1/2" x 11" data sheets into a 534 Card Punch mdl 3 for punched card output.

PREREQUISITE: A 534 Card Punch mdl 3.

Specifications: Data sheets are fed from a pneumatically controlled hopper with a 600-sheet capacity, through the reading area, and di-

tected to one of two stackers. The main stacker has a capacity of 600 sheets. Sheets with detected errors are directed to a se-

date stacker with a 50-sheet capacity. Documents are stacked in reverse sequence in both stackers.

Data to be read can be placed on data sheets with ordinary #2 pencil, or by a 1403 Printer, a 1403/2203 printer mdl 1 or 2 with a 52-

or 63-character type bar with arrangement A, H or K, a 1443 mdl N1 or 2203 mdl A1 with a 52- or 63-character type bar, or a 5203

Printer. The type bar... train,... or 1443/2203 type bar must be equipped with an enlarged dash which replaces the stand-

ard dash. See "Type Catalog."

A 534 Card Punch mdl 3 is cable-connected to the 1232 to punch data read from the data sheets. All marks read from a docu-

ment are stored as bits in a sonic delay line storage unit until transferred to the card punch. The duplicating feature of the card punch

can be used to duplicate common information into a group of cards. When not used with the 1232, the 534 can be used as an in-

dependent card punch... see 534 for details.

Documents are read at varying rates of speed, depending upon how many card columns are punched into a card. Throughput

ranges from approximately 650 to 2,000 documents/hour depending on the document size.

Data Sheets... 8-1/2" x 11"... up to 1,000 mark positions printed on a side... 2,000 positions when printed on both sides. Pre-

printed mark positions are printed in rows of 20 positions. Each row is divided into two 10-position segments. Each 10-position group

called a word for the purpose of defining a marking area. If Segmented Word (#6405) is installed, each word can be divided

into two 5-position segments. Data words and segments can be grouped into various combinations to form fields for record-

ing the source data.

Supplies: For printing marks, use IBM ribbon 1136430 or 1136440 on the 1403 (all models). 422536 on the 1443/2203,

1136990* on the 5203, or equivalent ribbons capable of produc-

ing acceptable marks.

Manuals: See "IBM Marketing Publications KWIC Index," G320-

1621.

Specify: [1] Voltage (115 V AC, 1-Phase, 60 Hz) #9880 for locking plug, or #9881 for non-lock plug.

[2] Kickstrips: #9431... field installable. When kickstrips are installed, the open area under the machine is enclosed. This re-

duces the amount of '"toe-room' for the operator and may be inconvenient to the customer if the power outlet is located un-

der the machine.

MULTIPLE SPREAD CARD (#5262). For punching up to four cards for each data sheet card. Each card will be numbered se-

quentially by a punch in columns 1. Any or all of the following fields can be punched into a card: master sheet data ([if Master

Mark (#5045) is installed])... page or identification data... and a por-

tion of the detail data from the data sheet in spread card form.

Limitation: Cannot be installed with Unit Record Card (#8560).

SEGMENTED WORD (#6405). For punching data... a word or segment into a single card... rule. A two-position mode cho-

se... Segment" and "Word" controls mode of operation. When set to "Segment," marks in positions 0 thru 4 are punched in one

card column and marks in positions 5 thru 9 are punched in the next card column. When set to "Word," marks in positions 0 thru

9 are punched in one card column.

UNIT RECORD CARD (#5850). For punching a separate card for each field on the data sheet. Cards will be punched only for those

fields containing marks. Each card can contain: master sheet data... each position data (page number, order number, sales-

man's number, etc.)... field number... to identify item) and... marked detail data (quantity, etc.).

LIMITATION: Cannot be installed with Multiple Spread Card (#5262).

1232 OPTICAL MARK PAGE READER

Special Feature Prices:

MAC/ MRC Purchase MMMC

Master Mark #5045 $ 54 $2,225 $ 50 $ 77

Special Feature Prices:

MAC/ MRC Purchase MMMC

Master Mark #5045 $ 54 $2,225 $ 50 $ 77

Multiple Spread Card 5282 32 1,350 2.00 44

Segmented Word 6405 32 1,350 1.00 21

UNIT RECORD CARD 6580 42 1,775 2.00 44

Document Inspection Gauge: One is furnished with each 1230, 1231, or 1232 as a Customer Engineering Tool. Used for checking

printing alignment on data sheets. (additional gauges 6286848)

* Available via price request.
1255 Magnetic Character Reader

Purpose: Sorts documents, used in banking and other applications, meeting specifications under "Highlights" below. Available as a stand alone sorter, or with an appropriate attachment feature, reads magnetic character data into a 2770 system in home or line mode. For use with S/360 models 22, 25, 30, 40, 50, a S/370 model 115 thru 158, 3031 Processor, or a 4331 or 4341 Processor.

For use with System/3, System/32, System/34 and S/360 model 20, see GSD manual.

Model 1 Reads and/or sorts up to 500 six-inch documents per minute into six stackers.

Model 2 Reads and/or sorts up to 750 six-inch documents per minute into six stackers.

Model 3 Reads and/or sorts up to 750 six-inch documents per minute into twelve stackers.

Model Changes: Field installable only between mdl 1 and mdl 2.

Highlights: Actual sorting and processing speeds depend upon length of document, paper quality, atmospheric conditions, and/or 2772 terminal and transmission limitations or host system limitations. Reads all fields and sorts on any field.

Uses a new, lower cost, single gap MICR reading technique, providing MICR capabilities for smaller volume operations. Reading performance may differ from other reader sorts. Pre-installation runs of actual documents are strongly recommended to determine expected performance. The input hopper holds 5-1/2" of documents for checking the off-line non-stop feeding. Models 1 and 2 each have six horizontal stackers in one vertical bay, while model 3 has twelve horizontal stackers arranged in two vertical bays. Six stacker units and individual stackers have a capacity of 2-1/2". The transport mechanism opens for access to the document path. An operator-resettable total document counter is provided.

Designed for ease of operation and operator training. The operator panel, feed hopper and stackers are in a compact area for operator convenience and minimum space requirements.

In addition to performing the basic modulus 10 or 11 checking function, the self-checking number/improved recognition feature, when installed and operative, is integrated with the MICR reading circuitry to reduce account number rejects and substitutions. This field is especially subject to folding, banding, and print specification deviations. Rejects and character substitutions will be reduced in proportion to the severity of document degradations, thus reducing customer reconciliation expense.

Sorting -- for mdl 1 and 2, offline sorting uses five sort stackers and one reject stacker for a two-phase digital sort. Phase 1 sorts even digits, rejecting odd digits which are sorted in phase 2. This conforms to the sort pattern of other six-stack sorters and permits the start of phase 2 sorting without removing phase 1 documents from the stacker. If Alternate Sort Pattern (#9301) is specified, digits 0-4 sort in phase 1 and digits 5-9 sort in phase 2.

For mdl 3, one-phase sorting on digits 0-9 with rejects directed to stacker "R" at top of first bay. Stacker "A" at top of second bay is used to select items when the High Order Zero and Blank Column Selection feature is installed.

Online 2710 systems operation suspends sorting, automatically alternating between two stackers on a stacker full condition, with the rejecting of invalid documents.

Stacker selection is under program control when operating online to a computer system.

Field Lengths -- the amount field and transit-routing field are fixed length. The process control identifier and serial number field are variable length, the account number field may be fixed or variable length. See "Specify" below.

Checking -- readability of each magnetic character and special symbol is checked on fixed-length fields. Check on fixed-length fields are checked on all fields designated by the operator for reading into the system or terminal in the online mode, or on all fields designated for checking in off-line mode. When attached to the 2770 system, error documents are automatically rejected by the 1255 and data is not transferred to the 2772 buffer.

MICR E13B Printing -- the type font, print quality, and code line arrangement on the documents must meet the specifications recommended by the American Bankers Association Technical Committee on Check Handling. The specifications and related data are available in booklets 1473R and the Supplement to 1473R, both of which are available at no charge from the American Bankers Association, 1120 Connecticut Avenue NW, Washington, D.C. 20036.

Documents -- intermixed paper and card documents (including travelers checks) within the following specifications can be processed:

Width -- 2.5" to 4.25"

Length -- 5.75" to 8.875"

Thickness -- .003" to .007"

Paper Stock -- 20 lb. to 44 lb. (card stock)

Carrier documents, enclosing a non-processable item, up to 0.150" in thickness may be used if “Highlights” below. Available as a stand alone sorter, or with an appropriate attachment feature. Available as a stand alone sorter, or with an appropriate attachment feature, reads magnetic character data into a 2770 system in home or line mode. For use with S/360 models 22, 25, 30, 40, 50, a S/370 model 115 thru 158, 3031 Processor, or a 4331 or 4341 Processor.

Document Evaluation -- documents must be evaluated at least six months prior to installation to determine whether the level of print quality is acceptable to the customer, with time for corrective action if necessary. Subject to print quality may cause excessive rejects and character substitutions.

Transmission -- when used with the 2770 system, the 1255 reads into the two 2772 buffers, automatically stopping and alternating between buffers on a specified number of documents. Buffer Expansion (#1490) is required on the 2772. The number of records (documents) held by the buffer is determined by the maximum fixed length field or the Amount Field on line 158. The records/buffer may be channeled to the CE, and is not subject to host control. In one transmission and input record, reading in characters in excess of the maximum record length specified causes an error condition. The following options are available:

Maximum Record Length (including special symbols)

<table>
<thead>
<tr>
<th>Records/buffer</th>
<th>53</th>
<th>41</th>
<th>30</th>
<th>24</th>
<th>20</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>16</td>
<td>20</td>
</tr>
</tbody>
</table>

Balance-List (#1470) facilitates pretransmission balancing to batch total tickets of stacked batches. In Mode A, operating under 1255 speed limitations, the feature totals the Amount Field on good items and prints the good item total, batch ticket total, and derived difference on the 2770 system printer. In Mode B, under 2770 system printer speed limitations, the results are detailed listed with the same total cycles as Mode A. Documents are listed with limited print editing and limited columnar formatting.

PREREQUISITES:

For 1255 -- all documents must be mechanically jogged prior to each pass through the machine ... joggers are available from commercial sources. A sorting tray is recommended.

For 2770 -- one 1255 can be attached to a 2770 system. 1255 Attachment (#9755) and Buffer Expansion (#1490) are required on the 2772 ... 2772 Adapter (#7850) is required on the 1255 itself. See "Special Features," Direct Control (#3274) or External Interrupt (#3125) is required on the processing unit. There are no special features required on the 4341 Processor to attach the 1255. External Signal (#3898) is required on the 3115, 3125, and the 4331 Processor.

For S/360 model 22, 30, 40, 50 -- a S/370 model 115 thru 158, 3031 Processor, or a 4331 or 4341 Processor -- one 1255 can be attached to a system ... requires a channel control unit position ... a byte multiplexer channel is recommended. The 1255 should normally be the highest priority device on the channel. System/360/370 Adapter (#6360) is required on the 1255 ... see 'Special Features,' Direct Control (#3274) or External Interrupt (#3125) is required on the processing unit. There are no special features required on the 4341 Processor to attach the 1255. External Signal (#3898) is required on the 3115, 3125, and the 4331 Processor.

For S/360 model 25 -- special feature on the 2025: Multiplexer Channel, or Selector Channel ... see 2025.

For S/360 model 26, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except on 2022, 4020, 2020, 2040, 2030, 2040, 2050).

For S/370 model 115, 125 -- Byte Multiplexer Channel (special feature), External Signal (#3898) ... see 3115, 3125, 3150. On a 3115-0, #9307 is required.

For S/370 model 135 -- multiplexer channel (standard), Selector Channels (special features) ... see 3135.

For S/370 model 135-3 -- byte multiplexer channel (standard), byte multiplexer channels (special feature) ... see 3135-3.

For S/370 model 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

For S/370 model 145 -- multiplexer channel (standard), selector channels ... see 3145.

For S/370 model 145-3 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3145-3.

For S/370 model 148 -- byte multiplexer channel (standard), block multi-lexer channels (standard) ... see 3148.

For S/370 model 155, 158 -- multiplexer channel (standard), 2-bit Byte Multiplexer Channel (special feature), block multiplexer chs.mdls (first two are standard) ... see 3155, 3158.

3031 Processor -- byte multiplexer channel (one is standard), byte multiplexer channels (five are standard) ... see 3031.

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dash symbol from transit field to storage. With symbol in storage, the program can distinguish between duplicate foreign and U. S. transit numbers. Field Installation: Yes.

51-COLUMN CARD SORTING (#4380). Model 1 -- for reading and sorting 51-column card documents. When installed, machine speed is reduced to approximately 405 dpm for six-inch documents. For 51-column cards, speed is approximately 500 dpm. Models 2 and 3 -- when installed, machine speed is reduced to approximately 605 dpm for six-inch documents. For 51-column cards, speed is approximately 750 dpm. Note: For optimum performance on all models, card documents should be separated out from standard size ABA documents on first pass operations. Field Installation: Yes.

HIGH ORDER ZERO & BLANK SELECTION (#4520). This permits selection to pocket A of documents during a digit sort having only blanks or zeros in the sort position and in all higher order positions of the field. Limitation: Available on the mdl 3 only ... operations offline only. Field Installation: Yes.

S/360/370 ADAPTER (#6360). To attach the 1255 to the Multiplexer Channel (#5248) on the 2025, 3115, 3125 or 4311, or the standard multiplexer channel on the 2022, 2030, 2040, 2050, 3135, 3135-3, 3138, 3145, 3145-3, 3148, 3158, 3031 or 4341. Field Installation: Yes.

SELF-CHECKING NUMBER/IMPROVED RECOGNITION (#7060). For reducing rejects and substitutions caused by defects in the account number field and for checking modulus 10 or 11 self-check digit account numbers up to 10 positions long, including the self-check digit and dashes. SLT pluggable card wiring determines the modulus calculated and weighting factor for each digit. SLT card is removed and inserted by the CE for customer wiring. An operator panel on/off switch is the only customer control of the feature. The self-check digit may be in any position, always using a weighting factor of 1. Modulus 10 will check any weighting factor 0 thru 9, summing the product digits, and checking for an even multiple of 10. Modulus 11 will check any weighting factor, summing the products and checking for either an even multiple of 11, or for a constant remainder of 4.

This feature, when installed and operative, replaces the basic character substitution checking circuitry with the more accurate modulus 10 or 11 checking circuitry while the account number field is being read. Documents with marginal printing that might normally be rejected as potential substitutions will be processed if all characters pass the self-checking digit test, thus reducing the chances of a reject. All account numbers that fail the self-checking digit test will cause the document to reject, thus reducing the chances of a substitution. Since the account number field is frequently subject to folds, banding, multilatation and print specification deviations, rejects and substitutions will be reduced in proportion to the severity of document degradation. Field Installation: yes.

2772 ADAPTER (#7850). To attach the 1255 to a 2772 Control Unit, A switch (adjacent to the self-checking number switch) is provided which permits listing documents previously rejected to determine which field and which character caused the reject. Field Installation: Yes.

Special Features: Prices: MAC/ MRC Purchase MMCC

Balance-List: $1470 75 $2,990 7 0 $343
Dash Symbol Transmis 3215 565UC 35 NC 21
51-Column Card Sorting 4380 16 661 NC 93
High Order Zero & Blank Selection 4520 33 1,315 5.00 157
S/360/370 Adapter 6360 506 19,800 37.00 1,255
Self Checking Number/ Improved Recognition 7060 54 2,135 2.50 173
2772 Adapter 7850 48 1,915 3.00 323

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Highlights: The ten-key keyboard permits fast, accurate, touch entry of data. The ten-key keyboard includes two types of keypads: length and amount entry for sorting, detailing, and inscribing. Length -- and amount entry for sorting, detailing, and inscribing are inscribed: Length -- and amount entry for sorting, detailing, and inscribing are inscribed adjacent to the amount for identification of transaction or control field. The etched Endorser prints at random in an area approximately 3 inches wide in the order of quick impressions.

PROCESS CONTROL KEYBOARD (DP Machines)[#5705]. Consists of two rows of keys, numbered blank thru 9, located to the right of the ten-key keyboard. Used either to key in a special transaction code or to override any two digits of the emitted process control code.

ROUTING AND TRANSIT FIELD (DP Machines)[#6300]. Permits printing of the Routing and Transit Field as well as the Amount Field and Process Control Field in one pass of the document. The field is keyed in the ten-key keyboard and transferred into a storage area. The amount is then keyed and the document dropped into the check chute. The document will be positioned at the inscribing station, the amount is to be inscribed and process control programmed. The document will advance to the Routing and Transit Field and the field will be inscribed. A "Routing and Transit" key and means of clearing the routing and transit storage are provided.

SHIFT IDENTIFICATION SWITCH (DP Machines)[#7138]. A dial switch, labelled OFF-1-2-3, that provides the operator with a means of identifying a shift number in any one of the five positions of the Distribution Total Identification number. The switch is located adjacent to the program switch.

THIRD PROGRAM (DP Machines)[#7948]. Provides program cards, wires and overlays for a third program. Prerequisite: Program Cards, Second Set (#9552) ... see “Specify” above.

AUTOMATIC FLOAT ANALYSIS (#1294, 1296). To print two float figures in the Routing and Transit Field. The deposit ticket has an 8-digit serial number. It is printed in the field on the deposit ticket and is repeated in the four high-order positions of the field on each event document.

LIMITATION: Cannot be installed with Automatic Float Analysis (#1294, 1296).

MAC/ MRC/ Purchase MMMC

ACCT. NUMBER FIELD (#1010). Permits inscribing of the amount, process control, and account number in one pass of the document. Amount is stillar to that of the Routing and Transit Field (#8300), in that the account number may be transferred to storing and inscribed in the same pass as the amount and process control field. A repeat key and a means of clearing the storage are provided. Includes an additional setup key adjacent to the ten-key keyboard to allow the operator to select a blank or dash in either the account number or routing and transit field.

ADDITIONAL TOTALS (#1071). Adds sufficient counters to provide a total of 20 distribution totals, each with a 4-digit item count. These counters are used and controlled in the same manner as the normal distribution counters in the basic machine.
<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/</th>
<th>MRC</th>
<th>Purchase</th>
<th>MMMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account Number Field #1010</td>
<td>17</td>
<td>$7</td>
<td>$551</td>
<td>$4.00</td>
<td>$91</td>
</tr>
<tr>
<td>Additional Totals</td>
<td>1071</td>
<td>17</td>
<td>551</td>
<td>5.50</td>
<td>23</td>
</tr>
<tr>
<td>Auto Float Analysis</td>
<td>1294</td>
<td>34</td>
<td>1,060</td>
<td>5.50</td>
<td>32</td>
</tr>
<tr>
<td>Auto Float Analysis</td>
<td>1296</td>
<td>34</td>
<td>1,080</td>
<td>5.50</td>
<td>32</td>
</tr>
<tr>
<td>Checker Signal</td>
<td>1935</td>
<td>25</td>
<td>NC</td>
<td>3.50</td>
<td>23</td>
</tr>
<tr>
<td>Endorse &amp; Serial Num</td>
<td>3791</td>
<td>17</td>
<td>689</td>
<td>6.00</td>
<td>100</td>
</tr>
<tr>
<td>High Volume Total</td>
<td>4603</td>
<td>10</td>
<td>321</td>
<td>1.50</td>
<td>23</td>
</tr>
<tr>
<td>Process Control Keybd</td>
<td>5705</td>
<td>17</td>
<td>551</td>
<td>1.50</td>
<td>66</td>
</tr>
<tr>
<td>Routing &amp; Transit Field</td>
<td>6300</td>
<td>17</td>
<td>551</td>
<td>4.00</td>
<td>91</td>
</tr>
<tr>
<td>Shift Identification Sw</td>
<td>7138</td>
<td>2</td>
<td>73</td>
<td>NC</td>
<td>27</td>
</tr>
<tr>
<td>Third Program</td>
<td>7948</td>
<td>3</td>
<td>123</td>
<td>NC</td>
<td>15</td>
</tr>
<tr>
<td>Transit Analysis</td>
<td>8016</td>
<td>13</td>
<td>482</td>
<td>3.50</td>
<td>23</td>
</tr>
</tbody>
</table>

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the desired Feature # indicated below at the price listed in M10000 pages.

- Endorser Plate (#3792)
- Blank Endorser Plate (#3793)

NOTE: When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M10000 pages for description, ordering instructions, and field installation.
1282 Optical Reader Card Punch

Purpose: Optically reads numeric data and three special characters from printed 51- or 80-column cards and punches the data read into the same card at a maximum rate of 200 cards/minute.

Highlights: The digits 0-9 and three special characters, plus (+), dash (-) and a solid vertical Line (\_), are read at a character recognition station. A maximum of 32 characters can be read and punched during a single pass. Unreadable information is automatically rescanned up to two times. Standard card punching, punch suppression, special symbol punching, gang punching, zero insertion, and double punch-blank column detection are determined by control panel wiring. A program card is premarked by the user to control field selection. A line selection device permits operator selection of any one of eight to ten horizontal line positions on the forms, depending upon the type of font to be read. Self-checking number detection is controlled by the premarked program card and control panel wiring.

Printing: For efficient operation, the printing to be read must conform to the specifications established for the 1282. Cards can be printed by a 1403 Printer mdl 1, 2, 3, 7 or N1, 1404 Printer mdl 2, IBM Selectric\textsuperscript{\textregistered} Typewriter mdl 721, 723 or 725, and IBM Standard Electric Typewriter mdl C. They can also be created by any imprinters which produce the specified print quality.

The standard machine can be ordered to read any two of the following (see item [2] under "Specify") [1] 1428 enlarged for typewriters, 1403 and 1404 ... [2] 1428 enlarged front reading for imprinters ... [3] 1428 enlarged reverse reading for imprinters.

The 1403 and 1404 normally print 10 characters per inch (10 pitch). However, there is no restriction on the pitch of printing to be read other than that it be no greater than 10 pitch. Any number of characters less than 10 pitch per inch can be read. Adjacent fields can have differing pitch.

Documents: Both 51- and 80-column cards can be processed, but only one size can be processed at a time. Additional document considerations, relating to the printing device, recommended ribbons, and type styles, are specified in the table below.

Standard Features: One single-section, 22-hub, self-contacting control panel with complement of wires (see "Specify" below) ... a 1,000-card capacity hopper ... a lens selector knob [a 2-position switch can be inserted in the reading of either enlarged font (1428 or Farrington 7B) or 1424 standard font] ... a digi emitter ... a character reading station ... a rescan feature... self-checking number detection ... twenty positions of DPBC detection ... two document counters ... two radial stackers, each with a 1,000-card capacity ... charcoal covers and a white operator console.


Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): \#9884 for 208 V, or \#9886 for 230 V (locking plugs only).

[2] Characters to be Read: Specify one of the following: \#9090 -- for 1428 standard front reading and 1428 enlarged front reading.

[3] Test Decks: One or both of the following test decks must be specified unless Farrington 7B Font Recognition (#3950, 3952) is ordered ... to test the machine, either \#9719, 9720 or Farrington 7B Font test documents must be used, depending upon the application.

Prices: 1282 1 \$1,848 \$64,080 \$339

Plan Offering: Plan B Purchase Option: 45% Maintenance: C Warranty: B Per Call: 2

Special Features

Alternate Field Control (#1250). To select fields for reading under control of hand-printed vertical field mark.


Expanded Field Suppression (#3833). Basic machine permits punch suppression of up to four fields, each containing a maximum of 12 character positions ... this feature increases the number of punch suppression control fields to six ... it is requisite for Optical Mark Reading (#5480-5484).

Farrington 7B Font Recognition (#3950, 3952). To read and punch documents printed in Farrington 7B Font by credit plate imprinters. \#3950 -- without Bar Code or Alpha Blanking ... \#3952 -- with Bar Code and Alpha Blanking. Specify: Either or both -- \#9714 for front reading test deck, \#9716 for reverse reading test deck.

Optical Mark Reading (#5480-5484). Information marked on cards in addition to printed characters can be read and converted to punched holes. Similar to mark sensing, but location of marking positions and type of marking pencil differ. See Manual GA24-3106 for details. Specify: One of the following -- \#5480 for 5 positions, 80-column card, front field ... \#5481 for 6 positions, 80-column card, front field ... \#5482 for 12 positions, 80-column card ... \#5483 for 5 positions, 80-column card, center field, and 51-column card ... \#5484 for 6 positions, 80-column card, center field, and 51-column card.

Prerequisite: Expanded Field Suppression (#3833).

Self-Checking Number Field Correction (#7065). Operates in conjunction with the standard self-checking number error detection feature. Documents with a single unreadable character in a self-check field ordinarily are rejected. This feature automatically corrects a single unreadable character and makes the document acceptable. Documents with more than a single unreadable character are rejected. This feature is not recommended for use with imprinter applications.

Serial Number Punching (#7090). To punch consecutive numbers from one to five digits in length in ascending or descending sequence. The first number to be punched is manually set by the operator.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>M/R</th>
<th>Purchase</th>
<th>MMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternate Field Control</td>
<td>#1250 23</td>
<td>$734</td>
<td>$3.00</td>
<td>$45</td>
</tr>
<tr>
<td>DPBC Detection</td>
<td>#3435 35</td>
<td>$1,090</td>
<td>5.50 $66</td>
<td></td>
</tr>
<tr>
<td>Expanded Field Suppression</td>
<td>#3833 17</td>
<td>551</td>
<td>1.50 $62</td>
<td></td>
</tr>
<tr>
<td>Farrington 7B Font Recognition #3950 166</td>
<td>6,050</td>
<td>3.50 $76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bar code &amp; alpha blank</td>
<td>#3952 166</td>
<td>6,050</td>
<td>3.50 $76</td>
<td></td>
</tr>
<tr>
<td>Optical Mark Reading</td>
<td>5 pos., 80 col, front field (5480) 166</td>
<td>5,425</td>
<td>13.00 $104</td>
<td></td>
</tr>
<tr>
<td>6 pos., 80 col, front field (5481) 166</td>
<td>5,425</td>
<td>13.00 $104</td>
<td></td>
<td></td>
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<tr>
<td>12 pos., 80 col</td>
<td>#5482 215</td>
<td>7,300</td>
<td>16.00 $138</td>
<td></td>
</tr>
<tr>
<td>5 pos., 80/51 col, front field (5483) 166</td>
<td>5,425</td>
<td>13.00 $104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 pos., 80/51 col, center field (5484) 166</td>
<td>5,425</td>
<td>13.00 $104</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-check No. Field Corr</td>
<td>7065 125</td>
<td>4,365</td>
<td>3.00 $32</td>
<td></td>
</tr>
<tr>
<td>Serial Number Punching</td>
<td>7090 105</td>
<td>3,735</td>
<td>6.00 $84</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Printing Unit</th>
<th>Recommended Ribbon/Carbon Paper (or equivalent)</th>
<th>Type Style Required for Reading by 1282</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other Than S/360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1403 mdl 1 or 2</td>
<td>MYLAR (424325)/Nylon (414486)</td>
<td>1428 Type Style, J4 (89599)</td>
</tr>
<tr>
<td>1416 (1403 mdl 3)</td>
<td>Nylon (414486)</td>
<td>1428 Type Style, J4 (89599)</td>
</tr>
<tr>
<td>1404 mdl 2</td>
<td>Nylon (419031)</td>
<td>1428 Type Style, J4 (89599)</td>
</tr>
<tr>
<td>S/360</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1403 mdl 2 or 7</td>
<td>MYLAR (424325)/Nylon (414486)</td>
<td>1428 Type Style, AN4 (89621)</td>
</tr>
<tr>
<td>1416 (1403 mdl 3 or N1)</td>
<td>Nylon (414486)</td>
<td>1428 Type Style, AN4 (89621)</td>
</tr>
<tr>
<td>1404 mdl 2</td>
<td>Nylon (419031)</td>
<td>1428 Type Style, AN4 (89621)</td>
</tr>
<tr>
<td>Available thru OPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Model C - IBM Electric Typewriter with Keyboard 009</td>
<td>Nylon No. 50 (1010655) 5121 Polyethylene (1010760)</td>
<td>Type Code 097, Type Mark VA5 Type Code 096, Type Mark VA8</td>
</tr>
<tr>
<td>Selectric Typewriter mdl 721, 723 or 725 w Keyboard 009</td>
<td>Nylon No. 50 (1136076)</td>
<td>Type Code 009</td>
</tr>
<tr>
<td>Credit Card Imprinter</td>
<td>Carbon paper to be used will be based on the application</td>
<td>1428 Enlarged Font or Farrington 7B Self-check</td>
</tr>
</tbody>
</table>
1287 OPTICAL READER

Purpose: Opticaly reads machine printed numeric digits, alphabetic characters, special symbols and handprinted numeric digits and certain alphanumeric characters into a 5/360 mdl 22, 25, 30, 40, 60, 65, 65MP, 67 (in 65 mode), 75, any S/370 Processor (1287 mdl 5 only on 115 and 125), or any 4300 Processor. Machine print or handprinted character reading dependent on model and features. See "Special Features."

Model 1 Can read multiple lines of numeric printed data from cut form paper or card documents.

Model 2* In addition to reading multiple lines of numeric printed data from cut form paper or card documents, can also read data from continuous rolls of paper (journal tapes) ... machine design permits easy operator change-over from document to tape handling, and vice versa, in a matter of seconds.

Model 3 Identical to model 1, with the added capability of reading ANSNC OCR Size A font character set specified in the "Table of Acceptable Characters."

Model 4* Identical to model 2, with the added capability of reading alphanumeric ANSNC OCR Size A font character set specified in the "Table of Acceptable Characters."

Model 5 Can read multiple lines of numeric handprinted digits and certain alphanumeric characters from cut form paper or card documents.

Model Changes: Cannot be made in the field.

Highlights:

All Models — the basic machine includes an input hopper with a capacity of 125 machine printed, typewriter, imprinted, or handprinted documents, an optical read station, a document transport, and three output stackers each with a capacity for 4 inches of documents. Documents are fed, one at a time, under program control to the read station where each document is held stationary while it is scanned and read by an electronic flying spot optical scanner. Documents can range in size from 2 1/4" x 3" to 9.51" x 9".

Format control flexibility is provided under S/360, S/370 or 4300 Processor program control to allow reading variable length fields in any sequence. Depending on model and feature mix, fields may contain machine printed, typewritten, imprinted, or hand­ printed characters, oriented in either of two directions on the same document. The stored program directs the beam, a field at a time, to the data to be read. Information is scanned from right to left (units to high order) and fed serially, a character at a time, to the system channel.

Unrecognizable characters are automatically rescanned. Unrecognizable characters may be displayed selectively under program control for online correction (except ANSNC OCR characters read in alphameric mode), or they may be transmitted to the processor as machine printed substitute character code (use of "G8" symbol is available on RPQ) for possible programmed correction or reconstruction. The document remains in the read station until ejected under operator program control. Final disposition of each document into one of three output stackers (A, B or R) is controlled by the program. Stackers A and B can be used for selecting two classes of documents. Stackers B and C is normally used for selecting documents with unrecognizable characters. Automatic overflow between stackers A and B can be used to extend the length of document runs without stopping the machine.

All models provide the following features:

- Multi-line, normal and plus 90 degrees reading of numeric 1428 or ANSNC OCR Size A type fonts produced by high speed printers and IBM Selectric typewriters, and reading of imprinted (1428 E or ANSNC OCR Size C fonts) or handprinted numeric digits and certain alphabetic characters from documents.
- Format flexibility under processor program control.
- Automatic rescans of unreadable characters.
- Cathode ray tube character display with selective online correction of unreadable numeric characters from the operator keyboard.
- Document counter.

Model 1 or 2 — the digits 0-9 and the alphabetic characters C, N, S, T, X, Z printed in 1428 font, plus a special preprinted vertical field mark symbol, can be recognized. The digits 0-9 and the three abstract symbols, "book", "fork" and "chair" printed in the American National Standard Character Set for Optical Character Recognition (ANSNC OCR Size A) font, plus the special preprinted vertical field mark symbol, can be recognized.

Model 3 or 4 — the alphameric ANSNC OCR character set described in the "Table of Acceptable Characters - 1287" below and the characters described for mdl 1 or 2 can be read.

Model 5 — the handprinted digits 0-9 and alphabetic characters C, S, T, X and Z and numbers preprinted in Gothic 3/16" can be recognized.

Features for Model 5 are:

- Numeric handprinting basic font.
- Alternate NHP Character Read-Verify Mode selectable under program control.
- Keyboard and Display Console for online correction.
- Hopper Preload Tray.
- Stackor Foot Treadle start-stop control.
- Background color contrast.

Speed (Documents) — maximum document throughput depends upon document size, the number of characters and fields to be read: machine printed, handprinted, mark read, printed character registration or alignment, use of online correction, and the processor program. For full details, including speed formula, see SRL GA21-9064 and GA21-9150.

Maximum document throughput can range from 665 documents per minute for a 3" long stub with one field of 20 machine-printed characters, to less than 100 documents per minute for a 6" long document containing 50 fields of handprinted characters.

Documents and Printing (all models) — for optimum operation, print quality must conform to quality specifications established for the 1287 described in SRL GA21-9064 and GA21-9150. Except for printing, only original copy may be processed. Document sizes and weights must conform to those specified in SRL GA21-9064 and GA21-9150. Also see Serial Numbering (#6550, 6553) under "Special Features" for special document size restriction.

Additional documentation concerning S relating to the printing device, recommended ribbons and type styles can be found in SRL GA21-9064 and GA21-9150.

Journal Roll Reading (model 2 or 4 only) — a journal tape transport permits reading the digits 0-9 and the selected characters C, N, S, T, X, Z and symbols "hook", "fork" and "chair" printed in 1428 font (with #9736 or #4470); or the digits 0-9 and six special symbols printed in NCR Optical Type Font (with #5300) from journal rolls. The same read station device in journal mode reading is used for reading rolls. A maximum of 38 characters may be read from a single journal roll line. Maximum character spacing is 10 characters/inch. Unreadable characters are automatically rescanned.

The line to be read is positioned automatically and scanned under program control from units to high-order (right to left - read forward orientation) ... tapes may be processed in either direction. The operator can control the fields to be scanned, the font selection and tape processing direction (forward or backward) by means of the console. Unreadable characters may be corrected online by the operator, or the line containing the unreadable characters may be marked under program control for offline correction.

In addition to all the features of the model 1 and 3, models 2 and 4 provide:

- Forward or backward tape reading.
- Input roll feeding up to 200' capacity.
- Online manual correction of unreadable characters via operator keyboard.
- Line marking of lines containing unreadable characters under program control.
- Easy operator changeover from document to journal tape handling, and vice versa, in a matter of seconds.

Speed (Journal Rolls) — depends upon the number of characters per line, tape width, line spacing and vertical registration printing accuracy. For full details, including speed formulae, see SRL GA21-9064.

Throughput is affected by online correction and the user's program ... rescan and line marking of lines containing unreadable characters may also affect throughput.

Journal Rolls — size ranges, and specific journal tape considerations relating to the printing device, ribbons, type styles, paper color, and quality are contained in the "Table of Acceptable Characters" below. For reading NOF type style, NCR Optical Type Font (=5300) is required ... see "Special Features."

Optional Features: Available on models 1, 2, 3, 4 are — Numeric

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1287 Optical Reader (cont’d)
Handwriting (#5370) including preprinted number recognition of 3/16” Gothic characters, Farrington 7B Font (#3945), 1428 and ANSCS OCR Font (#4470) which permits alternate reading of both fonts in separate, pre-identified fields under program control, and Serial Numbers (#6550). The following are also available: On models 2 and 4 — NCR Optical Font (#5300) ...”

**PREREQUISITES:** Multiple 1287s, all models in any combination, can be attached ... each 1287 contains its own control unit and requires a channel control unit position.

**S/360 m12 25** — special feature on 2025: Multiplexer Channel or Selector Channel ... see 2025.

**S/360 m12 22, 30, 40, 50** — multiplexer channel (standard), or Selector Channels (special features). Except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050. For attachment to a S/360 m12 30, a 2030 D1 or larger is required.

**S/360 m12 65, 65MP, 67 (In 65 mode), 75** — basic multiplexer channel of a 2870, Selector Subchannels (special features) of a 2870 ... see 2870.

**S/370 m12 115, 125** — (1297 m12 5 only) Multiplexer Channel (special feature) ... see 3115, 3125.

**S/370 m12 135** — byte multiplexer channel (standard), Selector Channels (special features), Block Multiplexer Channel (special feature) ... see 3135.

**S/370 m12 135-3** — byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

**S/370 m12 145** — byte multiplexer channel (standard), Selector Channels (first one is standard), Block Multiplexer Channel (special feature) ... see 3145.

**S/370 m12 145-3** — byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3145-3.

**S/370 m12 148** — byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

**S/370 m12 155, 158** — byte multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), Block Multiplexer Channels (first two are standard) ... see 3155, 3158.

**S/370 m12 165, 168** — basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2870.

**3031 or 3032 Processor** — byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

**3033 Processor** — byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

**4311 Processor** — byte multiplexer channel (optional), block multiplexer channel (optional).

**4341 Processor** — byte multiplexer channel (standard), block multiplexer channels (2) for optional.

**Bibliography:** S/360 — GC20-0360, S/370 — GC20-0001

**Specify:** [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

**[2] Color:** #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

**[3] Type Font (mdls 1, 2, 3, 4 only):** #9735 for reading 1428 and 1428 E Type Font only, or #9736 for reading the American National Standard Characters Set for Optical Character Recogni- tion only ... neither of these are to be specified if 1428 and ANSCS OCR Font (#4470) is ordered. See "Special Features."

**[4] Background Color Contrast:** #9030, if desired (standard on md1 5). The feature allows using background color for outlining numeric handwriting boxes and mark read positions on documents where high visual contrast is desired. Background color is limited to blue range of visual spectrum when printed to maximum intensity permissible with this feature. Consult SRL GA21-9064 and GA21-1950 for description of ink characteristics. The feature is compatible with 1287 approved blue-green to blue range of background colors printed at standard maximum intensity limits. Limitations: Not compatible with purple ink journal rolls and IBM 1050 C-53 timing machine. Its use is required for each mark read column regardless of the orientation of the marks. Data should be recorded with #2 pencils or grade HB fine line lead for mechanical pencils. Includes the ability to read numbers preprinted on documents by the forms supplier in Gothic 3/16” font.

**OPTICAL MARK READING (#5479).** For reading mark entered data from documents. Marks may be oriented vertically, slanted at an angle of 45° as defined for mark reading with the 1418 Optical Character Reader feature codes 4950, #4951 respectively, or drawn horizontally as defined for mark sensing features on the 5128 Optometer 6 timing machine. Its use is required for each mark read column regardless of the orientation of the marks. Data should be recorded with #2 pencils. **SERIAL NUMBERING (#6550).** (mdls 1 thru 4 only) Provides the capability of sequentially numbering documents from 00000 to 99999. Printing is done along the trailing edge of the front face of the document after reading. A ten-position numbering head is provided of which five positions are read. Simultaneous. Selection of documents to be printed is governed by manual control switch setting in conjunction with stacker selects controls. Printing in flight is accomplished without deactivating the machine. Printing is non-OCR quality. Ribbons: The feature uses a black ribbon (1138643) or purple ribbon (1138644), or equivalent.

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SERIAL NUMBERING

This feature cannot process documents smaller than 3.00" wide x 4.75" long.

**SERIAL NUMBERING (MDL 5 only)** Function and limitations same as Serial Numbering (MDL 50) except provides two alternate print positions in a band adjacent to the normal print position. Selection of print position is under manual control... also provides five stacker-serial numbering control combinations and independent batch numbering document printing control.

### Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/ MRC Purchase</th>
<th>MON/C</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expanded Symbol Set #3850</td>
<td>$73</td>
<td>$2,240</td>
<td>$3.50</td>
</tr>
<tr>
<td>Farrington 7B Font</td>
<td>3945</td>
<td>709</td>
<td>700</td>
</tr>
<tr>
<td>1428 &amp; ANSCS OCR</td>
<td>4470</td>
<td>709</td>
<td>1.00</td>
</tr>
<tr>
<td>Mach Printed OCR Font #4900</td>
<td>541</td>
<td>14,688</td>
<td>25.90</td>
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<tr>
<td>OCR Type Font 5300</td>
<td>104</td>
<td>3,204</td>
<td>5.00</td>
</tr>
<tr>
<td>Numeric Handwriting 5370</td>
<td>637</td>
<td>25,632</td>
<td>55.00</td>
</tr>
<tr>
<td>Optical Mark Reading 5479</td>
<td>104</td>
<td>3,204</td>
<td>5.00</td>
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<tr>
<td>Serial Numbering 6550</td>
<td>313</td>
<td>9,144</td>
<td>66.00</td>
</tr>
<tr>
<td>Serial Number (MDL 5)</td>
<td>6555</td>
<td>313</td>
<td>9,144</td>
</tr>
</tbody>
</table>

### TABLE OF ACCEPTABLE CHARACTERS - 1287

<table>
<thead>
<tr>
<th>1287 Fonts</th>
<th>#9735 or #4470 on 1287 mdls 1 thru 4, or #4900 on 1287 mdls 5</th>
<th>#5300 on 1287 mdls 1 thru 4, or #4900 on 1287 mdls 5</th>
<th>#53945 on 1287 mdls 1 thru 4, or #4900 on 1287 mdls 5</th>
<th>1287 mdls 3 or 4 only</th>
<th>ANSCS OCR Size A (10) (11)</th>
<th>IBM Selectric Typewriter (14) (15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM 1428</td>
<td>ANSCS OCR Sizes A &amp; C</td>
<td>NO†††</td>
<td>7B†††</td>
<td>3211 (14), 1403 (17)</td>
<td>3203 (16)</td>
<td>3800 or 3803 (15)</td>
</tr>
<tr>
<td>1287 Fonts</td>
<td></td>
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<td></td>
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<tr>
<td>#9735 or #4470</td>
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<tr>
<td>#9735 or #4470</td>
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<tr>
<td>#4900 on 1287 mdls 5</td>
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<td></td>
</tr>
</tbody>
</table>

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1) Digits 0-9 available in 1428 F (elongated) for imprinting.
2) National Optical Font shown by permission of National Cash Register Co.,
   F-1 by permission of Farrington Manufacturing Co.,
   and for equivalent.
3) Recognized and transmitted in document mode only (LVM-Long Vertical Mark,
   VFM-Vertical Field Mark).  Recognized and transmitted in tape mode only (1428R font).
4) In 1428 font the characters C, N, S, T, X and Z may only occupy the units
   position of the field or line.
5) In ANSCS OCR Size A font, the characters C, N, S, T, X and Z may only
   occupy the units position of the lines in journal mode (mdls 2 and 4).
6) Only the characters 0-9 are available in ANSCS OCR Size C font.
7) For machine printed fields a pre-printed long vertical mark is permitted.
8) Group Erase permits ignoring a line or field. Symbol must be at least .300" long overstriking at least one standard height character. It must overstrike the first character on that end of the line on which scanning is initiated.
9) Character erase is not available in the ANSCS OCR Size A character set. Available to ignore a character and its space for typewriters.
10) Two reading modes are available, numeric defined and alphanumeric intermixed.
11) The following characters are available in numeric defined mode:
12) The following characters are available in numeric defined mode: Digits 0-9 available in 1428 F (elongated) for imprinting.
13) National Optical Font shown by permission of National Cash Register Co.,
   F-1 by permission of Farrington Manufacturing Co.,
   and for equivalent.
14) Recognized and transmitted in document mode only (LVM-Long Vertical Mark,
   VFM-Vertical Field Mark).  Recognized and transmitted in tape mode only (1428R font).
15) Minimum paper weight for documents produced on the 3800 is 20 lb.

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**1288 OPTICAL PAGE READER**

**Purpose:** Optically reads printed alphabetic and numeric characters and specified symbols on up to page size documents (max. 9" x 14") into a S/360 mdl 22, 25, 30, 40, 50, 65, 65MP, 67 (in 65 mode), all S/370 Processors (except 115 and 125), or all 4300 Processors. With Numeric Handwriting (#5370) it can also read handwritten numeric digits and certain alphabetic characters.

**Highlights:**
- The basic machine includes an input hopper with a capacity for up to a 10" stack of documents, a document separator and aligner station, an optical read station, a document transport, and two output stackers each with a capacity of up to 4.5" of documents.
- Documents are fed, one at a time, under program control to the read station where each document is held stationary while it is scanned and read by an electronic flying spot optical scanner. Multiple lines of printed data can be read on documents which range in size from 3" x 6.5" to 9" x 14".

The digits 0-9, twenty-six alphabetic characters and certain special symbols printed by the devices noted in the "Table of Acceptable Characters" below in the American National Standard Character Set for Optical Character Recognition (ANSACS OCR) Font, plus the character erase symbol, can be recognized.

**Format control flexibility,** called the formatted mode, is provided under S/360 or S/370 or 4300 Processors program control to allow reading variable length fields in any sequence. Fields may contain machine printed, typewritten or handwritten (with #5370) characters, oriented in either of two directions on the same document. The stored program directs the beam, a field at a time, to the data to be read. Information is scanned from right to left (units to high order) and fed serially, a character at a time, to the system channel.

Unformatted mode permits multiple and continuous variable length alphanumeric lines, up to 6 lines/inch, right or left justified, to be read in the "normal" direction only. Preprinted reference marks are not required, however, a clear margin of at least 1" at the top and 1/2" on the other three sides must be provided.

Multi-line field mode allows the mixture of both formatted and unformatted reading on a document. See the 1288 SRL GA21-9081 for details on this capability and document design limitations when using this mode of operation on the 1288.

Unreadable handwritten and Gothic characters are automatically rescanned. Characters are transmitted to the processor as the standard EBCDIC substitute character code (use of @ symbol available on RPQ for possible programmed correction or reconstruction). The document remains in the read station until ejected into one of two stackers (A or R) under control of the processor program. Stacker R is normally used for selecting documents with unrecognized characters.

**Speed** -- maximum document throughput depends upon document size, the number of characters and fields to be read (machine printed, typewritten, handwritten, mark read), and the processor program. For throughput for both formatted and unformatted documents, see formulse in SRL GA21-9081.

**Documents and Printing** -- for optimum operation, print quality must conform to quality specifications established for the 1288 described in SRL GA21-9081. Document sizes and weights must conform to those specified in SRL GA21-9081. Additional document considerations relating to the printing device, recommended ribbons and type styles can be found in SRL GA21-9081.

---

**TABLE OF ACCEPTABLE CHARACTERS AND PRINTING DEVICES 1288**

<table>
<thead>
<tr>
<th>ANSI OCR Font Size A Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Selectric Typewriter</td>
</tr>
<tr>
<td>(or equivalent)</td>
</tr>
<tr>
<td>IBM 1403 mdls 2, 3, 7, N1</td>
</tr>
<tr>
<td>IBM 3203 (all mdls)</td>
</tr>
<tr>
<td>IBM 3211 (4) (or equivalent)</td>
</tr>
<tr>
<td>IBM 3800 (5)</td>
</tr>
<tr>
<td><strong>Basic 1288</strong></td>
</tr>
<tr>
<td><strong>Symbol</strong></td>
</tr>
<tr>
<td>D A N :</td>
</tr>
<tr>
<td>2 C P :</td>
</tr>
<tr>
<td>3 D G :</td>
</tr>
<tr>
<td>4 E R :</td>
</tr>
<tr>
<td>5 F S :</td>
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<tr>
<td>6 G T :</td>
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<tr>
<td>7 H U :</td>
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<tr>
<td>A L Y :</td>
</tr>
<tr>
<td>B N Z :</td>
</tr>
<tr>
<td>blank</td>
</tr>
<tr>
<td>With #3850</td>
</tr>
<tr>
<td>+ (3)</td>
</tr>
<tr>
<td>_ (2)</td>
</tr>
<tr>
<td>_ (3)</td>
</tr>
<tr>
<td>blank</td>
</tr>
<tr>
<td>blank</td>
</tr>
</tbody>
</table>

(1) Lithograph printing approved.
(2) Group Erase permits ignoring a line or field. Symbol must be at least .300" long overstriking at least one standard height character. It must overstrike the first character on that end of the line on which scanning is initiated.
(3) Character Erase is not available in the ANSCS OCR Size A character set.
(4) The OCR Print Package (#5450) is a prerequisite for OCR applications. 20-24 lb. bond is recommended for optimum performance. When other papers are used custom testing should be performed to assure adequate reading performance. Group or character erase feature should be inactive when reading 3211 generated documents.
(5) Minimum paper weight for documents produced on the 3800 is 20 lb.

**Optional Features:** Expanded Symbol Set (#3850), Numeric Handwriting (#5370) including preprinted number recognition of 3/16" Gothic characters, Optical Mark Reading (#5479), and Serial Numbering (#6550) are available... see "Special Features."
1288 Optical Page Reader (cont’d)


Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, or #9005 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES: Mdl MRC Purchase MMMC

Plan Offering: Plan A, Additional Use Charge Rate: 30%

Warranty: B Purchase Option: C 40%

Metering: I/O Unit (Online) Per Call: 3

SPECIAL FEATURES

EXPANDED SYMBOL SET (#3850). To recognize the following eight special symbols when they are created by an IBM Selectric typewriter, or equivalent: + = {} % ...

NUMERIC HANDWRITING (#5370). [Plant installation only] For reading handprinted numeric digits 0-9 and handprinted alphabetic characters C, S, T, X, Z from documents (N is not available) ... C, S, T, Z must be in the units position of a field ... X can be anywhere. For optimum operation, character shapes and spacing must conform to the basic rules of handwriting as outlined in SRL 21-9064. Information should be handprinted with ordinary #2 pencils or grade HB fine lead for mechanical pencils. Includes the ability to read numbers preprinted on documents by the forms supplier in Gothic 3/16" font. Prerequisite: For attachment to a S/360 mdl 25, this feature requires that the 1288 be at EC level 815210B and the 2025 be at EC level 132845.

OPTICAL MARK READING (#5479). For reading marks that have been either handmarked or machine printed onto documents. The feature is format compatible (except for horizontal marking) with the similar feature (#5479) on the 1287 Optical Reader, with the basic capability for reading ten- or twelve-position mark read columns. On the 1288, flexibility is increased by allowing these 1287-type mark read fields to be located anywhere in the scanable area and in either +90 or normal rotation. A further innovation provides the ability to select, by programming, any number of positions from 1 to 12 to be read from a column or group of columns. A timing mark is required for each mark read column whether 1, 2, 3, etc. up to 12 positions. Handmarked data should be recorded with ordinary #2 pencils. Marks may be parallel to the timing mark or in any orientation up to 45° in either direction from parallel to the timing mark.

SERIAL NUMBERING (#6550). For serial numbering the front side of documents after reading. A ten-position numbering head is provided ... 5 digits are manually set ... 5 are unit advanced for each document read. A control switch provides either selective serial numbering based on stacker selection or a 10-digit batch number without unit advancing. Ribbons: The feature uses a black ribbon (1136843) or purple ribbon (1136844), or equivalent.

SPECIAL FEATURE PRICES:

MAC/ MRC Purchase MMMC

Expanded Symbol Set #3850 73 $ 2,240 $ 3.50 $282

Numeric Handwriting 5370 1,050 38,448 82.00 PO

Optical Mark Reading 5479 104 3,772 7.50 275

Serial Numbering 6550 313 9,144 66.00 449

MACI MRC Purchase MMMC

FIC

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# 1401 PROCESSING UNIT

[No longer available]

**Models:** Choice depends upon core storage capacity and I/O configuration desired ... see "Prices" below.

**Model Changes:** Model changes can be made within groups 1 thru 3, 11 thru 13, 4 thru 6, 14 thru 16, or 24 thru 26 having the same alphabetic prefix.

Except for G or H models, a 1401 from group 1 thru 3, 11 thru 13, can be changed to group 4 thru 6, 14 thru 16, or 24 thru 26 while adding a 1406, if the 1401 is serial no. 20000 or above.

A model G1 thru G13 may be changed to a G1 thru G13, or visa versa.

**NOTE:** When a model G1 thru G3 is changed to a G1 thru G13, a 1403 mdl 6 must physically replace a 1403 mdl 4 or 5 ... when a G11 thru G13 includes a 1402 mdl 5, the 1402 must be field changed to a mdl 4 when converting to a 1401 mdl G1 thru G3.

**PRICES:**

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</table>

Plan Offering: Plan A, Additional Use Charge Rate: 30% Purchase Option: 45%
Maintenance: B Per Call: 3 Metering: Base Unit (meters 1406) Warranty: B

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SPECIAL FEATURES

The following special features are on an "as available" basis for field installation.

- For General Use

ADVANCED PROGRAMMING (#1060). [B, C, D, E, F mdls only] Includes the following instructions: Indexing — three index locations are provided to modify addresses automatically. Store A-Address Register (QAAA) — stores contents of "A" address register in (AAA) prior to reading this instruction. Store B-Address Register - H(3AA) — stores contents of "B" address register in (AA) prior to reading this instruction. Move A-Address Register — a special "Move" instruction for moving a complete record from one storage area to another without regard to word marks within the record. For details see Shared Reference Manual.

BIT TEST (#1470). [B, C, D, E, F, G mdls only] To test any position in storage for any bit. Limitation: Since the function provided by this feature is part of Column Binary (#1990), it is not required and cannot be imputed while input/output is in process. Computing continues while the I/O unit performs to send or receive data, and between character transfers. When the transfer begins, computing is interrupted to receive a character when signalled by the I/O unit. Limitation: Can be field installed only on 1401s serial no. 26410 or above.

HIGH-LOW-EQUAL COMPARE (#4575). [B, C, D, E, F, G mdls only] Indicators can be tested for a high, low or equal condition after a "Compare" instruction has been executed ... applies to alphabetically as well as numeric data.

MULTIPLY-DIVIDE (#5275). [B, C, D, E, F mdls only] Provides the following: Multiplying an area of core storage must be set aside equal in length to the combined length of multiplier and multiplicand, plus one. This area, or "B" field, is used to hold the multiplier in the high-order positions and develop the product in the low-order positions. The multiplicand is placed in the "A" field. After the multiplier has been moved to the high-order positions of the "A" field, the multiply operation is executed. Upon completion of the operation, the product is available beginning with the units position of the "B" field. Speed depends upon the size of the units position (multiplier and multiplicand). If a 6-position field multiplied by a 4-position field requires only 1.96 milliseconds. Divide — a field in which the quotient will be developed is set aside immediately to the left of the dividend field. The divisor can be any other place in core storage. After the "Divide" instruction is executed, the quotient is available beginning with the units position of the dividend, provided the memory aside beginning with the units position of the dividend field. Speed depends upon the size of the expected quotient.

PROCESSING OVERLAP (#5730). [B, C, D, E, F mdls only] Allows the system to be in process while input/output is in process. Computing continues while the I/O unit performs to send or receive data, and between character transfers. When the transfer begins, computing is interrupted to receive a character when signalled by the I/O unit. Limitation: Can be field installed only on 1401s serial no. 26410 or above.

Notes: [1] For most efficient system operation involving card operations, installation of Early Card Read (#3550) on the 1402 in conjunction with this feature is recommended ... [2] This feature is recommended to permit operations on 1419 Magnetic Character Reader ... [3] This feature is not effective with a 1009 Data Transmission Unit, a 1012 Tape Punch, 1412 Magnetic Character Reader, 1418 Optical Character Reader, or 1426 Alphameric Optical Reader.

SENSE SWITCHES (#7600). [A, B, E, F, G, H mdls only] Standard on C and D mdls] A group of six sense switches which provide manual control of a stored program and give six additional conditions the "Branch" instruction can test ... the "d" modifier of the instruction specifies which switch is to be tested. Maximum: One group.

- For Card and Tape Systems

COLUMN BINARY (#1990). [B, C, E, F mdls only] To convert binary cards to magnetic tape, and vice versa ... cards with multiple significant digit punching in a single column can also be processed. This feature is required to attach a 7641 Hypertape Control, if Bit Test (#1470) is not installed. Limitations: When reading such characters, the validity check is inhibited because all characters are considered valid ... since this feature includes the function provided by Bit Test (#1470), it is not required and cannot be installed if #1470 is installed.

- For 1402 Card Read Punch

PUNCH FEED READ CONTROL (#5899). [A, B, C, E, F, G, H mdls only] Required for Punch Feed Read (#5890) on a 1402 mdls 1, 4, 5, 6. Limitation: For field installation 1401 must be serial no. 20000 or above.

READ PUNCH RELEASE (#6040). [A, B, E, F, G, H mdls only ... standard on C mdls] The Read Release and Punch Release instructions are installed as one feature and operate as follows: Read Release — operation code "B" causes the card reader to start the next cycle and allows processing to continue. A "Read" instruction must then be given prior to the time the reader is ready to read the "9" row of the card ... allows a gain of 21 milliseconds for processing time between successive card feed cycles. Punch Release — operation code "B" causes the card punch to start the next cycle and allows processing to continue. A "Punch" instruction must be given prior to the time the 1401 must read data to the punch for punching the "12" row of the card ... allows a gain of 37 milliseconds of processing time between successive punch cycles.

- For Printers

EXPANDED PRINT EDIT (#3635). [A, B, E, F, G, H mdls only] Standards on C and D mdls] Expands print edit as follows: Asterisk Protection — printing of high-order zeros replaced with asterisks until a significant digit is sensed. Floating Dollar — printing of all high-order zeros is suppressed and a dollar sign printed ... automatically to the left of the first high-order significant digit. Decimal Control — when a decimal point is sensed, suppression of zeros is stopped unless a significant digit is not sensed in any of the positions to the right of the decimal point, in which case all zeros and the decimal point are suppressed. Sign Control Left — a "CR" or "-" character is printed in the high-order position of the control word if the edited word is negative.

NUMERICAL PRINT CONTROL (#5380). [B, C, D, E, F mdls only] Required for Numerical Print Feature (#5381) on a 1403 model 1, 2. Limitation: Can be field installed only on 1401s serial no. 20000 or above.

PRINT CONTROL (#5539). [B, E, F mdls only ... standard on C mdls] Required to control the 32 additional print positions of a 1403 Printer to a 1404 Printer.

PRINT CONTROL, ADD'L (#5540). [A, B, E, F, G1, G2, G3 mdls only] ... standard on C and D mdls] Required to control the 32 additional print positions of a 1403 Printer mdl 2 or 5.

PRINT STORAGE (#5585). [B, C, D, E, F mdls only] Provides additional storage to print a line from the main storage print area with the "Print" instruction. Upon completion of the transfer, normal program execution is resumed while the printer prints a line from print storage, increasing available process time by the 84 milliseconds normally interlocked by a print operation. Reduces job time on combination I/O operations involving printing. Two additional instructions, "Branch on Carriage Busy" and "Branch on Paper Busy", are provided to interrogate the status of carriage and printer and to allow maximum utilization of the additional processing time.

READ-COMpare ADAPTER (#5991). [B, C, E, F mdls only] Required for Read-Compare (#5990) on a 1404. Limitation: Can be field installed only on 1401s serial no. 26410 or above.

SELECTIVE TAPE LISTING CONTROL (#6412). [B, C, E, F mdls only] Required for Selective Tape Listing Feature (#6411) on a 1403 mdls 1 or 2. Limitations: Can be field installed only on 1401s serial no. 20000 or above ... cannot be installed on a 1401 ordered for future installation of a 1404 Printer.

SPACE SUPPRESSION (#7246). [For any mdl] Provides 1403 or 1404 space suppression under program control.

- For Tape Systems

COMPRESSED TAPE (#2210). [C, D, E, F (except F3-F6) mdls only] Two additional instructions permit the 1401 to read a tape record written with zero elimination by a 7070/7074 system and to expand it within core storage for processing. Prerequisite: Advanced Programming (#1060).

800 CPI FEATURE (#3580). [C1-C6, D1-D6, F13-F16 mdls only] To operate 729 V Magnetic Tape Units at 800 cpi density ... See Tape Densities Option Switch under the "Punch" Bit Test (#1470). It is not required and cannot be installed if #1470 is installed.

TAPE INTERMIX (#7804, 7805). [C1-C6, D1-D6, F13-F16 mdls only] -- to mix 729 IVs with 729 IIs or Vs ... #7805 -- to mix 729 II or Vs with 729 IIs. Limitation: Can be installed only on 1401s serial no. 20263 or above.

Prerequisite: To operate 729 Vs at 800 cpi in any of these combinations, an 800 CPI Feature (#3580) is also required.

- For 1311 Disk Storage Drives

DISK STORAGE DRIVE ADAPTER (#3339). [B, C, E mdls only]
### 1401 Processing Unit (cont'd)

Required for the attached 1311 mdl 4 ... also permits attachment of up to four additional 1311 mdl 2s.

- **For Serial I/O Units**

**SERIAL I/O ADAPTER (#7080).** [B, C, D, E, F, G mdls only] To attach a 1012 Tape Punch, 1231 Optical Mark Page Reader, 1419 Magnetic Character Reader, or Direct Data Channel (#3271) to the system. One adapter can be used for all these attachments, but only one attachment can be made at a time. Limitation: Only a 1012 or a 1231 can be attached to 1401 G mdls.

**Prerequisites:** Diagnostic programs require the following minimum storage positions: For 1012 -- 2,000 ... for 1231 -- 4,000.

- **For Direct Inter-system Data Transfer**

**DIRECT DATA CHANNEL (#3271).** [B, C, D, E, F mdls only] Permits two 1401, or a 1401 and a 1414 (1440 or 1460) to transfer data between systems. Data is transferred via a cable connected to a Serial I/O Adapter (#7080) on each system. The cable can be manually attached or detached. When attached, no other attachment can be made to #7080. Only one #3271 is required to connect the two systems ... it may be ordered for either system, but Emergency Power-Off (#9144) must be ordered for the other system. Specify: Length of cable, to a maximum of 100 feet ... also indicate system to which the cable is to be attached.

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<td>Sense Switches</td>
<td>7600</td>
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<td>582</td>
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<td><strong>For Card and Tape Systems</strong></td>
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<td>Column Binary</td>
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<td>Printer (1404) Adapter</td>
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<td>Read-Compare Adapter</td>
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<td>78SUC</td>
<td>63</td>
<td>NC</td>
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**For Tape Systems**

- **Compressed Tape**                          | 2210  | 35  | 1,330    | 4.50 | 52  |
- **800 CPI Feature**                         | 3580  | 35  | 1,820    | NC   | 106 |
- **Tape Intermix**                           |       |     |          |      |     |
  - to add 729-IVs to II/Vs                  | 7804  | NC  | NC       | NC   | NC  |
  - to add 729 II/Vs to IVs                  | 7805  | NC  | NC       | NC   | NC  |
- **For 1311 Disk Storage Drives**           |       |     |          |      |     |
  - Disk Storage Drive Adpitr 3339           | 101   | 4,925 | 6.50 | 335 |
- **For Serial I/O Units**                   |       |     |          |      |     |
  - Serial I/O Adapter                      | 7080  | 101 | 3,845    | 2.00 | 299 |
- **For Direct Inter-system Data Transfer**  |       |     |          |      |     |
  - Direct Data Channel                     | 3271  | NC  | NC       | NC   | NC  |

† Field installation charge

---

**1402 CARD READ PUNCH**

[No longer available]

**Model 4** For a 1401 mdl G1, G2, G3, G11, G12 or G13

**Model 5** For a 1401 mdl G11, G12 or G13

**Model Changes:** Model 5 can be changed in the field to model 4, or vice versa.

The following specifications can be changed in the field:

1. Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

2. Color: Color Accent -- #9043 for blue, or, if other system units are to have red, yellow or gray accents, #9044 for charcoal. Extended Color -- #9031 for red, #9032 for yellow, or #9033 for blue.

3. Numerical Print Feature: #5381. For 1401 system only. Required if Numerical Print Feature (#5381) is installed on a 1403 Printer.

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
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<tbody>
<tr>
<td>4</td>
<td>$ 504</td>
<td>$30,520</td>
<td>$187</td>
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<tr>
<td>5</td>
<td>478</td>
<td>29,420</td>
<td>182</td>
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</table>

Plan Offering: Plan A, Additional Use Charge Rate: 30% Warranty: B Purchase Option: 45% Maintenance: C Metering: I/O Unit (Online)

**SPECIAL FEATURES**

The following features, as appropriate, are on an "as available" basis for field installation.

**EARLY CARD READ (#3550).** [Mdl 1 only ... standard on mdls 4, 5 and 6] To allow the 1402 to maintain high reading speed during lengthy processing routines. In such routines, the card reading mechanism can engage sooner, reducing time between reading of cards ... see appropriate Reference Manual for details.

**PUNCH FEED READ (#5980).** [Mdl 1, 4, 5, and 6 only ... not available on mdl 2] For punching output data into the same card from which input data was read. Adds a special set of brushing station ahead of the punch station. Limitation: Refer to SRL GA24-3074 for limitations on use of prepunched cards. **Prerequisite:** Punch Feed Read Control (#5985) on 1401.

**SPECIAL FEATURE PRICES:**

<table>
<thead>
<tr>
<th>MAC/</th>
<th>MRC</th>
<th>Purchase</th>
<th>MMMC</th>
<th>FIC</th>
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<td>Early Card Read #3550</td>
<td>$ 10</td>
<td>$ 241</td>
<td>NC</td>
<td>$234**</td>
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<tr>
<td>Punch Feed Control 5980</td>
<td>$ 31</td>
<td>1,045</td>
<td>$5.50</td>
<td>75</td>
</tr>
</tbody>
</table>

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M 1403.1
May 79
DP Machines

1403 PRINTER
Purpose: Printed output unit for the data processing systems
indicated below.
For use with System/3, S/360 mdl 20 and 1130, see GSD
manual.
Model

Print Speed
Pos.
(max)

For Use With

1t

100

600lpm

2

132

600lpm

3t

132

1 ,100 Ipm 141 0, 1440, 1460, 7010, 7040, 7040
7044, S/360 mdls 30, 40, 44, 50, 65,
67, 75, S/370 mdls 135 thru 165.

4t

100

465 Ipm

1401 mdls Gl, G2, G3.

5t

132

4651pm

1401 mdl Gl, G2, G3, 1440.

6

120

340 Ipm

1401 mdls Gll, G12, G13, H3, 1440.

7

120

600 Ipm

S/360 mdls 22, 30, 40, 44, 50, 65,
67, 75, 85, 195, all S/370 Processors, all 4300 Processors.

Nl

132

1,100 IpmS/360 mdls 22,30,40,44,50,65,
67, 75, 85, 195, all S/370 Processors, all 4300 Processors.

1401 mdls A, B" E, F, 1410, 7010,
7040, 7044
1401 mdls A, B, C, D, E, F, 1410,
1440, 1460, 7010, 7040, 7044,
S/360 mdls 22, 30, 40, 50, 65, 67,
75, 85, 195, all S/370 Processors, all
4300 Processors.

Model Changes: Can be made in the field between models 1 and
2, models 2 and 7, models 4 and 5, or models 5 and 2.
PREREQUISITES: 1403 mdl 3 or Nl only -- a 1416 Interchangeable Train Cartridge is required on each 1403 mdl 3 or Nl ... see
1416.
1401 (except G and H mdls) - one 1403 mdl 2 (by field change
from a mdl 1) can be attached. The 1403 mdl 2 requires Print
Control, Add'i (#5540) on the 1401.
1401 Model H3 -- one 1403 mdl 6 can be attached.
1401 G Models - one 1403 mdl 4 or 5 can be attached to a
1401 mdl Gl, G2, G3. Print Control, Add'i (#5540) is required
on the 1401 for a 1403 mdl 5. One 1403 mdl 6 can be attached
toa1401 mdIGl1,G12,G13.
1440 -- one 1403 mdl 2, 3, 5 (by field change from a mdl 4) or a
mdl 6 can be attached to a system via a 1446 Printer Control
equipped with the appropriate Attachment feature (#1325, 1326,
1327, 1328) ... see 1446.
1460 -- 1403 mdl 2s and 3s. can be attached only if the prerequisite 1461 I/O Control and 1462 Printer Control and any of
their required features are already installed.
7040/7044 -- up to three 1403s [mdls 1 , 2 and 3 in any combination] can be attached only if the prerequisite 1414 I/O Synchronizer mdl 3, 4 or 8 and its prerequisites are already installed.
5/360 mdl 25 -- one 1403 mdl 2 or 7 can be attached via an
Integrated 1403 Attachment (#4590) on the 2025, or one mdl
Nl can be attached via #4590 and an 1100 LPM Printer Adapter
(#3615) on the 2025 ... see 2025. For these attachments, an
appropriate adapter is also required on the 1403 itself ... see
item [3] under "Specify." 1403 mdl 2s, 7s or Nls can also be
attached to a system via a 2821 Control Unit mdl 1, 2, 3 or 5
attached to the S/360 mdl 25 multiplexer or selector channel ...
see 2821 for 1403 attachment details.
5/360 mdl 30, 40, 44, SO, 65, 67, 75, or 5/370 mdl 115, 125,
and Nl are attached via a 2821 Control Unit mdl 1, 2, 3 or 5 ...
see 2821 for attachment details. Notes: [1] 1403 mdl 3 is not
available on a S/370 mdl 115, 125 ... [2] For a 1403 mdl 2 or
3, an appropriate adapter is required on the 1403 itself. See
"Specify". For a S/370 mdl 125, 135, 135-3 or 138 also see
the following paragraph.
5/370 mdl 125, 135, 135-3, 138 -- a 1403 mdl 2, 7 or Nl can
be attached via an appropriate Integrated Adapter ... see
"Special Features" under 3125, 3135, 3135-3 or 3138. Note:
For a 1403 mdl 2, an appropriate adapter is required on the
1403 itself ... see "Specify." On a 1403 mdl 2, 7 or Nl, an
appropriate voltage conversion adapter is required on the 1403
itself '" see "Specify."

attachment details. Note: For a 1403 mdl 2, an appropriate
adapter is required on the 1403 itself ... see item [2] under
"Specify."
Highlights: Actual speeds depend upon the operation. The
system's processing unit performs all format and anlysis control. A
line of printing is presented to the printer in the arrangement in
which it is to be printed. All data printed is checked against data
received from core storage.
Each print position can print anyone of 48 characters ... alphabetic, numeric, and 12 special characters. Characters are spaced
10/inch. Line spacing is 6 or 8 lines/inch, under operator control. Continuous marginally punched forms from 3-1/2" to 183/4" in overall width are fed by an automatic carriage. Minimum
form depth is 1" ... maximum is 22" at 6 lineS/inch, or 16-1/2"
at 8 lines/inch. Forms spacing and skipping governed by the
stored program. A standard pre-punched 1 2-channel tape is
supplied with each 1403 for use in verification of forms movement.
Standard skipping is approximately 33" /second. The standard
carriage on printers used with all systems is dual-speed, except
for a 1403 mdl 1 or 2 used in a 1 401 mdl A system, or a 1 403
mdl 6 or 7 regardless of system. The dual speed carriage permits
skipping at approximately 75" /second on skips over 8 lines long.
Note: On a mdl Nl, under certain unique conditions, the
75" /second skip is turned off and skipping continues at approximately 33"/second ... see SRL GA24-3073 for details.
The printer and carriage open for easy loading and alignment of
forms. On all mdls except mdl Nl, forms are wheeled to and from
the printer on a double-duty, two-section forms stand which reduces paper handling and set-up time. The mdl Nl has sound
absorbent covers extending to the floor for reduced noise level. A
motorized cover facilitiates operator handling. The accoustical
cover design incorporates platforms for feeding and stacking of
forms. A forms cart is available for the mdl Nl ... see
"Accessories" below.
Program Compatibility -- the 1403 mdl 3 is program compatible
with the mdl 2 or 5. Existing programs for mdl 2s and 5s need not
be changed for a mdl 3, except in those cases where, because of
the reduced time required to print a line, the overall I/O scheduling must be re-optimized.
Note: Program compatibility between 1400 series systems and
S/360 mdls 25, 30, 40, 50 or S/370 mdls 125, 135, 135-3,
138, 145, 145-3, 148, 155 requires compatibility features on the
appropriate S/360, S/370 Processor or a 4331 Processor.
The 1403 mdl Nl is program compatible with the mdl 2 or 3 used
in S/360 mdls 25, 30, 40, 44, 50, 65, 67, 75 and with the mdl 2
used in S/360 mdls 22, 85, 195, any S/370 Processor or any
4300 Processor. Existing programs for the mdl 2s and 3s need not be
changed for a mdl Nl, except in those cases where, because of
the reduced time required to print a line, the overall I/O scheduling must be re-optimized.
The 1403 mdl 2 is program compatible with 5203 Printer mdls,
including the tapeless carriage facility. Existing programs for the
5203 need not be changed, except in those programs where the
overall I/O scheduling must be re-optimized to utilize the reduced
print time/line, or if the user wishes to use more print positions on
a 1403 than were on the 5203 being replaced.
Printed Output for Optical Character Reading -- 1403 print
chains and 1416 trains can be equipped for printing on documents
to be read by the following optical character readers:
1230 Optical Mark Scoring Reader
1418 Optical Character Reader
1231/1232 Optical Mark Page Reader 1428 Alphameric Optical Reader
1282 Optical Reader Card Punch
3881 Optical Mark Reader
1287 Optical Reader
3886 Optical Character Reader
1288 Optical Page Reader

Depending upon system with which the 1403 will be used, and the
optical character reader involved, see appropriate section of the
"Type Catalog" for feature #(s) to be specified for the required
1403 print arrangement. The ribbons used on the 1403 must be
capable of producing printed characters suitable for recognition by
the optical reader used. For recommended ribbons and document
specifications, see appropriate optical reader description.
Limitations: [1] The dual-speed carriage is not available on a
1403 mdl 6 or 7, or on printers used with 1401 mdl As.
[2] 1403 mdls 3 and Nl: Forms sets used on 1403 mdls 1, 2, 4,
5, 6 or 7 (chain printers) may not produce acceptable results
when used on 1403 mdl 3 or Nl (train printers). A six-part set
which gives satisfactory results on a chain printer may show a
decrease in the print quality of the last copies when used on an
1100 Ipm train printer ... for details, see SRL GA24-3041.

5/360 mdl 22, 85,195, S/370mdl 158, 168, 195, 3031, 3032,
3033 and 4300 Processors -- 1403 mdls 2, 7 and Nl are attached via a 2821 Control Unit mdl 1, 2, 3 or 5. See 2821 for

The print quality of the top sheet is affected by the underlying
sheets. Under no circumstances should the copy shdets be
used for optical scanning. For best results, use single-part
forms for OCR printing.

t

Bibliography:

No longer available.

S/360

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GC2G-0360,

S/370

--

GC20-0001,


1403 PRINTER (cont'd)


Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Voltage Adapter: #9709. Required when a 1403 mdl 2 or 3 is to be attached to any S/360, S/370 Processor or 4300 Processor. Limitation: 1403 mdl 3 is not available for attachment to a S/360 mdl 22, 25, 85, or any 4300 Processor. When an installed mdl 2, 3 or 5 (from other than S/360, S/370 or 4300 Processors) is retained for attachment to these systems, new cables must be ordered. Refer to Physical Planning Manual for cable requirements and ordering procedure.

When #9709 is field installed, the standard configuration chain/train previously installed will be modified to an AN or HN arrangement of the same type size or style. See "Type Catalog" (S/360, S/370 and 4300 Processors) -- 1403 and 1404 Printers) for feature # to which chain (or train) is to be modified. (Note: On a 1403 mdl 3 or 2, or 1416 for 1403 mdl 3) specifying "Change installed chain (train) # ______ -- # ______".

If Interchangeable Chain Cartridge Adapter (#4740) is installed on mdl 2, both alphameric chains (standard configuration only) will be modified, one to AN and one to HN. Modification is restricted to same type size or style as previously installed.

[3] Attachment to 2025 via Integrated 1403 Attachment (#4590): The following adapters are required on the 1403; On 1403 mdl 2, 3 or 5 on a Voltage Conversion Adapter (#3725), on 1403 mdl N1, an 1100 LPM Voltage Conversion Adapter (#8226). These can be field installed. Note: On a 1403 mdl 2, a Voltage Adapter (#9709) is also required ... see [2] above.

[4] Attachment to a S/370 mdl 125 via an Integrated Printer Adapter (#4662, 4667, 4668) or a S/370 mdl 135, 135-3, 138 via an Integrated Printer Adapter Basic Control (#4670) with either a S/360 or S/370 Voltage Conversion Adapter. Note: (#4672) or the Integrated 1403 Printer Mdl 7 Attachment (#4677). The following adapters are required on the 1403; on 1404 a Voltage Conversion Adapter (#9725) ... on 1403 mdl N1, an 1100 LPM Voltage Conversion Adapter (#9726). These can be field installed. Note: On a 1403 mdl 2, a Voltage Adapter (#9709) is also required ... see item [2] above.

[5] Print Chain/Train Arrangement:

With S/360, S/370 or 4300 Processors (1403 mdl 2, 3 or N1) -- see S/360, S/370 and 4300 Processors -- 1403 and 1404 Printers in "Type Catalog". For mlds 3 and N1, also see item [6] below. Universal Character Set Feature (#8640, 8641) is required on a mdl 2, 3 or N1, or Multiple Character Set Feature (#5110, 5111) on a mdl 2 or N1 for any arrangement other than the 48-character set composed of identical arrays of standard sequence ... see "Special Features" below and "Type Catalog" page TC-71, etc.

With 1401, 1410, 1440, 1460, 7010, 7040, 7044 (1403 mlds 1, 2, 4, 5, 6, 7 or 60 -- see feature #, unless Interchangeable Chain Cartridge Adapter is ordered. See "Special Features" below and "Other than S/360 - 1403 and 1404 Printers" in "Type Catalog." For mdl 3, also see item [6] below.

[6] 1416 Interchangeable Train Cartridge (mdl 3 or N1 only): At least one 1416 is required with each 1403 mdl 3 or N1 ... see 1416.

[7] Color: For mlds 1, 2, 3, 4, 5, 6, 7 -- Color Accent -- #9043 for blue, or, if other system units are to have red, yellow or gray accents, #9044 for charcoal. Extended Color -- #9031 for red, #9032 for yellow, or #9033 for blue. For mdl N1 -- #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white. For mlds 2, 5, 6, 7 -- #9046 for white.

[8] Tape Punch: Order Part No. 120910. If the 1403 is for a New Name Account. One punch is furnished at no charge per installation.

[9] For mdl 3 or N1, cross reference Branch/Plant Order No. of 1416(3) which will be used with the 1403.

[10] Kickstrip: [for 1403 mdl N1 only] #9350, if desired. Also available: When kickstrip(s) are installed, the open area underneath the machine is enclosed. They reduce the amount of "bedroom" and may be inconvenient to the user if the power outlet is located beneath the machine.

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1403 PRINTER (cont’d)

unchanged, except that an alphanumeric character causes a print check error. The numeric chain (#9485 for .095” type size, or #9484 for .079”) has ten numeric characters and the special characters $ & * , - and arranged in fifteen identical type arrays. Limitation: Not available for printers used with 1401 A mdls. S/360, S/370 or 4300 Processors. Specify: #8640 for an additional numeric chain (#9485 or #9484) and Interchangeable Chain Card Cartridge Adapter (#4740) with one alphanumeric print chain arrangement for #8640. See “Type Catalog” for feature #s. Prerequisite: #8640 Interchangeable Chain Card Cartridge Adapter (#4740) on the 1403 ... Numerical Print Control (#5380) on the 1401 Processing Unit, 1403 I/O Control, or 1430 Processor. See “Type Catalog” for feature #s. Prerequisite: #5380 Interchangeable Chain Card Cartridge Adapter (#4740) on the 1403 Processing Unit. 

When numeric printing is required, 1,400 lpm is possible. With alphanumeric printing, when the content is predominantly numeric, speeds in excess of 1,100 lpm can be obtained. The PCS feature has 48 characters on the chain, so arranged that the most frequently used characters were placed closest to the print head. For example, the alphanumeric train of Preferred Character Set A (#9561) consists of:

- Characters of primary preference, appearing 8 times
- Characters of secondary preference, appearing 4 times
- Characters of least preference, appearing 2 times

If output consists only of characters of primary preference, illustrated above, at least 1,385 lpm can be printed ... for characters of standard print preference only, at least 920 lpm ... for characters of least preference, at least 550 lpm. Actual speed depends upon the frequency of printing of characters most common on the train.

Printing is provided when the feature is in use. Easily interchangeable Train equipped with Preferred Character Set print train. See 1416 and “Type Catalog - Other than S/360 - 1403 and 1404 Printers” for feature #s. Each train component must be replaced by a capacity increase of 5523 is to be field installed on the 1403, unless customer desires to order an additional 1416. See 1416 and “Type Catalog” for items to be specified on 1416 order.

If both a standard train and a Preferred Character Set are desired; two 1416s are required, one with a Preferred Character Set print train. Each Preferred Character Set train is desired, only 1416 is required. Each print train owns its own 1416.

SELECTIVE TAPE LISTING FEATURE (#6410, 6411). [1401, except A or B mdls. 1440, 1460 or S/360 only] #6410 for mtl 1 or 2. Permits operation of 1.5” or 3.1” tapes ... may be fanfold or roll (fanfold only on mdl N1), up to 13 characters per 1.5” tape, up to 29 per 3.1” tape. Combinations of 3.1” and 1.5” tapes are possible. However, 3.1” tape requires one of the following pairs of 1.5” tape positions: 1 and 2, 3 and 4, 5 and 6, or 7 and 8. Each tape is individually spaced under program control. No formskip is provided when the feature is in use. Easily interchangeable by operator between tape listing and standard forms printing. Improved operation with all covers closed – low accoustical level. Can be used with an alphanumeric train or Universal Character Set Feature (#8640). Limitation: Cannot be installed on a 1403 mdl N1 attached to a S/360 mdl 25 via the Integrated 1403 Attachment (#4590). Prerequisite: Selective Tape Listing Control (#6425) on the 2821 Control Unit. 

UNIVERSAL CHARACTER SET FEATURE (#8640, 8641). [For S/360, S/370, 370-195, any S/370 Processor or any 4300 Processor] #8640 -- for mdl 3 or N1 ... #8641 -- for mdl 2 or 5. Required on a 1403 mdl 2, 3, 5 or N1 for any print arrangement other than a 48-character set composed of identical arrays of standard character sequence. Any set of 240 codes can be loaded from cards into a special storage unit in the 2821 Control Unit mdl 1, 2, 3 or 5, or a 3125 Processing Unit. The 240 codes must correspond in sequence to codes assigned to the graphics on the chain or train selected. This includes any announced print arrangement for S/360, 1404 series systems, or any arrangement of characters selected/designed by the customer for execution of his application requirements ... see “Type Catalog.” Charges for artwork, matrix, etc., for special slugs are to be added if applicable.

Note: This feature provides the same function as the Multiple Character Set Feature (#8641) on the 1403. A 1403 ... #8640, or 22 thru 195, any S/370 Processor or any 4300 Processor] #8640 -- for mdl 3 or N1 ... #8641 -- for mdl 2 or 5. Required on a 1403 mdl 2, 3, 5 or N1 for any print arrangement other than a 48-character set composed of identical arrays of standard character sequence. Any set of 240 codes can be loaded from cards into a special storage unit in the 2821 Control Unit mdl 1, 2, 3 or 5, or a 3125 Processing Unit.

A 1403 with Multiple Character Set Feature can be attached to a 2821 Control Unit equipped with the appropriate UCS Adapter (#8640, 8641, or 22 thru 195) and a 3125 Processing Unit with appropriate features (#4662 or #4668). Limitations: (1) Printing speed of the 1403 mdls 2 is limited to 750 lpm; that of the 1403 mdls 5 to 585 lpm; that of the 1403 mdls 3 or N1 to 400 lpm. (2) Following conditions or selection is restricted to the 256 code positions of the EBCDIC Code ... see SRL G23-3431.

Prerequisites: For each 1403 with #8640 or #8641, the appropriate UCS Adapter is required on the 2821, 3125, 3135-3 or 3138 ... see ‘Special Features’ under the appropriate unit ... for mdl 2, Interchangeable Chain Card Cartridge Adapter (#4740) ... for mdl 3 or N1, each different train arrangement requires its own 1416 Interchangeable Chain Train or Universal Character Set Feature (#8641) on the 1403 mdl 2 or N1 when attached to a 2025 Processing Unit via the Integrated 1403 Attachment (#4590) ... see Multiple Character Set Feature above. If 1403 is already equipped with the UCS Feature (#5110, 5111) do NOT order #8640 or #8641.

Note: If this feature is installed on a 1403 mdl 2 or 5 equipped with a fixed print arrangement, an Interchangeable Chain Card Cartridge Adapter (#4740) must also be ordered. Specify any two UCS print arrangements ... see Type Catalog, "S/360, S/370 and 4300 Processors - 1403 and 1404 Printers."

If customer desires to retain the former arrangement and to receive one additional one, the fixed cartridge will be modified for interchangeability and an additional interchangeable cartridge with selected print arrangement will be furnished. If #4740 is already installed with AN or HN arrangements, and customer desires to change to any other arrangement(s), order new chain(s) as follows:

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**Special Feature Prices:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/MLC/MLC</th>
<th>Purchase</th>
<th>MMMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aux Ribbon Feed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>#1376</td>
<td>$88</td>
<td>$81</td>
<td>$74</td>
<td>$2,000 $26.00 $88</td>
</tr>
<tr>
<td><strong>Interchangeable Chain</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cartridge Adapter</td>
<td>4740</td>
<td>88</td>
<td>81</td>
<td>74  2,030 NC 60</td>
</tr>
<tr>
<td>Multiple Character Set Feature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for model 2</td>
<td>5110</td>
<td>11</td>
<td>10</td>
<td>9   299  2.50 †</td>
</tr>
<tr>
<td>for model N1</td>
<td>5111</td>
<td>11</td>
<td>10</td>
<td>9   426  2.50 †</td>
</tr>
<tr>
<td>Numeric Print Fea</td>
<td>5381</td>
<td>267</td>
<td>246</td>
<td>224  5,865 14.00 PO</td>
</tr>
<tr>
<td>Preferred Char Set</td>
<td>5523</td>
<td>46</td>
<td>42</td>
<td>39  1,385 3.00 42</td>
</tr>
<tr>
<td>Selective Tape Listing Feature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for model 3 or N1</td>
<td>6410</td>
<td>225</td>
<td>207</td>
<td>189  7,505 15.00 432</td>
</tr>
<tr>
<td>for model 1 or 2</td>
<td>6411</td>
<td>225</td>
<td>207</td>
<td>189  5,260 15.00 246</td>
</tr>
<tr>
<td>for model N1 (new)</td>
<td>6420</td>
<td>334</td>
<td>307</td>
<td>281  11,010 39.50 1,265</td>
</tr>
<tr>
<td>Universal Character Set Feature</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for model 3 or N1</td>
<td>8640</td>
<td>11</td>
<td>10</td>
<td>9   426  2.50 ††</td>
</tr>
<tr>
<td>for model 2 or 5</td>
<td>8641</td>
<td>11</td>
<td>10</td>
<td>9   299  2.50 197</td>
</tr>
</tbody>
</table>

**FTP is 12-23 months.**

**Accessories:** The following item is available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in M10000 pages. See M10000 for additional information and field installation.

- **Stacker (#6413) -- for use with Selective Tape Listing Feature (#6410 or #6411) which is prerequisite.**

† Charge must be obtained from IBM.

†† FIC for model 3 is $191 ... for model N1 is $119.

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1404 PRINTER

Purpose: Printed paper and card document output unit for a 1401 (except A, D, G and H mdls), or S/360 mdls 25, 30, 40 or 50.

Highlights: Has all continuous form printing functions of the 1403, plus a dual channel cut-card feeding mechanism mounted on the left of the continuous form printing stations. Printing assembly is shifted to the cut-card or continuous form printing positions in a few seconds by the operator. Card documents and continuous forms cannot be printed on the same run. Cut-card feed becomes operative when printing assembly is shifted to the card side. The printing assembly has 132 print positions and has all 1403 features. Operation for printing continuous forms is identical to that of the 1403.

Card Printing -- during single card feeding, cards can vary in width from 51-column (4.852") to 80-column stub (14.75"). When feeding two cards, two 51-column or two 80-column cards can be printed at one time. Cards can vary from .006" to .009" in thickness. The number of cards printed per minute depends upon factors such as lines per document, position of first printed line, and number of lines per inch. Speeds up to 800 documents/minute are possible with the dual card feed capability.

PREREQUISITES:

For S/360 -- a 2821 Control Unit mdl 4.

For 1401 -- Printer (1404) Adapter (#5563) and Print Control (#5532) on the 1401 Processing Unit ... can be field installed on 1401 B, C, E, F mdls serial no. 26410 or above ... see 1401. NOTE: Print Control is standard on 1401 C mdls and need not be ordered.

Bibliography: S/360 -- GC20-0360, 1401 -- GA24-1495

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: Color Accent -- #9043 for blue, or, if other system units are to have red, yellow or gray accents, #9044 for charcoal. Extended Color -- #9031 for red, #9032 for yellow, or #9033 for blue.

[3] System/360 Adapter: #9709. Required when 1404 is to be attached to a 2821 mdl 4 ... also see [4] below.

[4] Print Chain Arrangement: One feature # unless Interchangeable Chain Cartridge (#4740) is ordered. See "Special Features" below and appropriate section of "Type Catalog." When #9709 is field installed, the standard configuration chain previously used will be modified to an AN or HN arrangement of the same type size or style. See "Type Catalog - S/360 and S/370 - 1403 and 1404 Printers" for feature # to which chain is to be modified. Submit specifying "Change installed chain # ... to #.

If Interchangeable Chain Cartridge Adapter (#4740) is installed, both alphabetic chains (standard configurations only) will be modified, one to an AN and one to an HN. Modification is restricted to same type size or style as previously installed. Submit MES as indicated above.

[5] Up-ending Kit: #9840, if required. Loan basis, remains property of IBM.

[6] Tape Punch: Order Part No. 120910 if the 1404 is for a New Name Account. One punch is furnished at no charge per installation.

MAC/ MRC Purchase MMC

1404 2 $1,680 $81,790 $645

Plan Offering: Plan A, Additional Use Charge Rate: 30% Metering: 1/O Unit (Online) Warranty: B Maintenance: C Purchase Option: 45% Per Call: 3

SPECIAL FEATURES

INTERCHANGEABLE CHAIN CARTRIDGE ADAPTER (#4740).

Permits operator to insert changeable chain cartridge with different type font, style or special character arrangement. The change can be made quickly without special tools. Operation of the printer remains unchanged. Two interchangeable cartridges with chains are supplied, one in lieu of the standard fixed cartridge and one additional. Depending upon system, see appropriate section of the "Type Catalog" for feature #s of available arrangements.

For Plant Installation -- specify #4740 and any two alphabetic print chain arrangements.

For Field Installation -- the installed fixed cartridge is modified for interchangeability and an additional interchangeable cartridge with chain is supplied. Specify #4740 and any one alphabetic chain arrangement. [Note: When an installed 1404 is to be modified for use with a S/360, both alphabetic chains will be modified at no charge ... see [4] under "Specify" above.]

READ-COMPARE (#5990). Permits the 1404 to read any 30 columns of the card(s) being processed. By programming, this data can be compared with the data being printed on the card(s) ... eliminates need for an off-line proof. Prerequisite: Read-Compare Adapter (#5991) on the 1401 Processing Unit or 2821 Control Unit mdl 4.

Special Feature Prices:

MAC/ MRC Purchase MMC M

FIC

Interchangeable Chain Cartridge Adapter #4740 $91 $3,400 NC $65

Read-Compare 5990 190 10,620 $39.00 177

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1412 MAGNETIC CHARACTER READER

[No longer available]

- The following specifications can be changed in the field.

[1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.

[2] Field Lengths: Two feature #s, one for Account Number, one for Process Control, from table below. Field lengths can be changed in the field.

<table>
<thead>
<tr>
<th>Length</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acct No</td>
<td>9210</td>
<td>9211</td>
<td>9122</td>
<td>9123</td>
<td>9213</td>
<td>9214</td>
<td>9215</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proc</td>
<td>9190</td>
<td>9191</td>
<td>9192</td>
<td>9193</td>
<td>9193</td>
<td>9194</td>
<td>9195</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[3] Color: Color Accent -- #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. Extended Color -- #9031 for red, #9032 for yellow, or #9033 for blue.

[4] Kickstrips: #9431 ... field installable. When kickstrips are installed, the open area underneath the machine is enclosed. This reduces the amount of "toe-room" for operator and may be inconvenient to customer if the power outlet is located under machine.

[5] Isolation Feature: May be required on units shipped prior to December 29, 1967 for attachment to S/360 mdl 30 ... see "Special Features" below.

- The following special features are on an 'as available' basis for field installation.

DOCUMENT COUNTER (#2385). Six-position counter which counts all documents passing thru machine. On and Off Control and Reset provided on operator’s panel. Maximum: One.

DASH SYMBOL TRANSMISSION (#3215). [Units serial no. 10055 or above only]. Transmits the E13B dash symbol from transit field to storage ... with symbol in storage, program can distinguish between duplicate Canadian and U.S. transit numbers.

ENDORSER PLATE The endorser plate is a purchase item made to the customer’s specifications. For description and field installation, see M10000 pages. It is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

ISOLATION, CONTROL UNIT (#4700). [Field installation only on units shipped prior to December 29, 1967 ... standard on units shipped after that]. To turn power on or off on the 1412 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. Prerequisites: S/360 Adapter (#7720) ... in all cases there are compatible EC level requirements.

MULTIPLE COLUMN SELECT - SORT SUPPRESS (#5215). Operator’s panel controls all operations of the feature. Multiple Column Select -- selects documents with specific numbers in four or less columns of any field. The numbers can be in a field other than that being sorted and the four columns need not be adjacent. Sort Suppress -- suppresses sorting on specific digits in any single column and selects those documents into a specific pocket. All other documents are sorted manually. Overflow stacking eliminates stoppage due to filled pockets. Limitation: Multiple column select and sort suppress cannot be simultaneous. Maximum: One.

SELF-CHECKING NUMBER (#7061, 7062). A self-checking number has two parts, the basic identifying number and its check digit. The check digit, derived from the identifying number by one of two techniques, is always the units digit of a self-checking number. The feature assures that all digits in the self-checking number have been correctly recorded. The field is verified as it is read during any pass. Limitation: Self-checking numbers for Modulus 10 are not compatible with those of Modulus 11.

#7061 - Modulus 10 -- has weighting factor of 1, 2, 1, 2, 1, 2. Will not detect following types of errors: 09 to 90 transposition ... interchanging of digits between alternate columns, e.g., 32647 for 34627 ... substitution of one self-checking number for another ... in some instances, transpositions having the formula "BAB" for "ABA", e.g., 121 for 212 ... in some instances, random errors, e.g., 23 printed as 56.

#7062 - Modulus 11 -- has weighting factor 7, 6, 5, 4, 3, 2. When the self-checking number is greater than six digits, weighting factor is repeated. In some instances, random type errors will not be detected, nor can a basic number requiring a check digit of 10 be used.

S/360 ADAPTER (#7720). [1412s serial no. 10085 or above only] Permits operation with a S/360 mdl 25 or 30. Limitation:

Once this feature is installed, the 1412 cannot be used with a 1400 series processor. Prerequisites: In order to operate with DOS or BPS, Direct Control (#3274) or External Interrupt (#3895) is required on the processing unit ... to operate with DOS, the 1412 must have EC 131182. Note: Inter-system attachment via Direct Control is limited when the 1412 uses the external interrupt lines. Signal in lines used by 1412s cannot be shared with the second processing unit.

MAC/ MRC Purchase MMMC FIC

| Document Counter | #2385 | $ 16 | $ 674 | $ 3.00 | $ 23 |
| Dash Symbol Trans | 3215 | 5565UC | 38 | NC | 22 |
| Isolation Control Unit | 4700 | NC | NC | NC | NC |
| Multiple Column Select- | | | | | |
| Sort Suppress | #5215 | 54 | 2,445 | 3.00 | 189 |
| Self-checking Number | | | | | |
| Modulus 10 | 7061 | 42 | 2,110 | 2.50 | 32 |
| Modulus 11 | 7062 | 70 | 3,280 | 3.50 | 26 |
| S/360 Adapter | 7720 | 108 | 5,770 | 10.00 | 875 |

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IBM

**1416 INTERCHANGEABLE TRAIN CARTRIDGE**

**Purpose:** A cartridge and print train which provides interchangeability of type font for the 1403 Printer mdl 3 or N1, and 3203 Printer (all mdls).

**Highlights:** At least one 1416 is required with each 1403 mdl 3 or N1 or 3203 (all mdls).

**Interchangeability** — when multiple 1416s are available, they may be interchanged by the operator, providing flexibility for printing different type fonts, type styles, or character arrangements. This flexibility opens new application areas with unique printing requirements such as form-letter writing, engineering and scientific data, chemical abstracts, and text printing.

**PREREQUISITES:** The 1416 functions only when mounted in a 1403 mdl 3 or N1, or a 3203 (all mdls).


**Specify:** Print Train Arrangement — see “Type Catalog” for characters in each available arrangement and feature #s to be specified.

[1] A rental 1416 must be capacity replaced (unless customer desires to order an addt'l 1416) when the following are to be field installed:

a) Preferred Character Set Feature (#5523) on 1403 mdl 3 in 1400 series system.

b) Universal Character Set Feature (#6440) on 1403 mdl 3 or N1 in S/360, S/370, 4300 Processors.

c) Any UCS train arrangement to replace AN or HN arrangement on a 3203 (all mdls), or a 1403 mdl 3 or N1 already equipped with Universal Character Set Feature (#6440).

d) A change in type size or style.

[2] When a Voltage Adapter (#9709) is field installed on a 1403 mdl 3, the standard configuration train previously used will be modified to an AN or HN arrangement; a PCS-A arrangement will be modified to a PCS-AN; or PCS-H will be modified to PCS-HN. Any of these changes is restricted to the same type size (style). See "Type Catalog - S/360, S/370 and 4300 Processors - 1403 and 1404 Printers" for feature # to which train is to be modified. Submit "Change installed train #___ to #___" on 1416, specifying feature (#6440).

[3] Except as stated in [1] and [2] above, order type slug substitutions whenever changes between the following train arrangements are to be made in the field: A and H ... AN and HN ... PCS-A and PCS-H ... PCS-AN and PCS-HN. See "Type Catalog" for applicable charges.


[5] Depending upon the system involved, see appropriate section of "Type Catalog" for feature numbers of desired OCR arrangements and associated sales manual "Reader" description pages to assure compatibility of printer/reader recognition ability.

**Note:** The ribbons used on the 1403 and 3203 must be capable of producing printed characters suitable for recognition by the optical reader used. Recommended ribbons and document specifications are referenced in the optical reader "Machines" pages.

[6] Cross reference Branch/Plant Order No. of 1403 and 3203 on which 1416 will be used. If multiple 1416s are ordered, reference appropriate 1403 or 3203 order number(s). The required information should be entered into the "Remarks Section" of the order at order entry time.

[7] Storage Container: #9666, if needed for the 1416. [Recommended for use when multiple 1416s are ordered for a single printer.]

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MAC/</th>
<th>MRC</th>
<th>Purchase</th>
<th>MMC/</th>
</tr>
</thead>
<tbody>
<tr>
<td>1416</td>
<td>1</td>
<td>101</td>
<td>$2,665</td>
<td>TM</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B Purchase Option: 55% Per Call: 3

**Warranty:** B

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Note: To be reproduced without written permission.
1419 MAGNETIC CHARACTER READER


For possible use with the S/360 mdt 20, see GSD manual.

Highlights: Documents read at a maximum rate of 1,600 documents a minute. Actual speed depends upon length of document and speeded program. Contains the standard features and performs all functions of a 1219 Reader Sorter. Pocket selection may be controlled by the 1419 or system's program. Feeding is controlled by the system. Can also be used for off-line sorting. Processing of Overlap (#5730) is required on the 1401 or 1461 (A460) to take full advantage of the 1419's speed. Individual fields can be processed immediately after they are read. Document reading can be overlapped with processing. Minimum processing time, including pocket selection, is 32.2 milliseconds... more than ample for sophisticated applications.

Documents -- magnetic characters must be recorded in the type font (E13B) and location designated by American Bankers Association Technical Committee on Mechanization of Check Handling. Intermixed paper and card documents within the following specifications can be processed: Width -- 2-3/4" to 3-2/3" ... Thickness -- .003" to .007". Paper Stock -- 20 lb. short grain to 44 lb. card stock. 31-column card stock can be fed at a rate of approximately 1,960 cards a minute. Note: For sorting 51-column cards, see 51-column Card Sorting (#3480) under "Special Features."

Checking -- readability of each magnetic character, including special symbols, in each field processed can be verified each time a document is read and/or sorted. A field length check is made on all fixed length fields being processed to assure that all numeric digits in the field have been printed. Documents not satisfying checking conditions are rejected. Fixed field lengths provide a powerful technique for controlling accuracy of processing.

Programming Compatibility -- reprogramming is required whenever:

a) A 1419 replaces a 1412 in an existing 1400 series installation.
b) A S/360, S/370 or 4300 Processor replaces a 1400 series installation.
d) A conversalon is made from one programming system to another.

PREREQUISITES:

S/360 mdt 22, 25, 30, 40, 50, 65, 67, any S/370 or 4300 Processor -- each 1419 requires a S/360 Single Address Adapter (#7720) or S/370 Single Address Adapter (#7730) ... see "Special Features" below. Either 1419 requires a channel control unit position.

S/360 mdt 25 -- special feature on 2025: Multiplexer Channel, or Selecto Channels ... see 2025.

S/360 mdt 22, 25, 30, 40, 50 -- multiplexer channel (standard), Selecto Channels (special features, except on 2022 one selecto channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdt 65, 67 -- selector channel of 2860, basic multiplexer channel of 2670, Selecto Subchannels (special features) on a 2870 ... see 2860, 2870.

S/360 mdt 115, 125 -- Byte Multiplexer Channel (special feature), External Signal (#3396) ... see 3115, 3125. On a 3115-0, #9031 is required.

S/360 mdt 125 -- multiplexer channel (standard), Selecto Channels (special features) ... see 3135.

S/360 mdt 135-3 -- byte multiplexer channel (standard), Block Multiplexor Channels (special features) ... see 3135-3.

S/360 mdt 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/360 mdt 145 -- multiplexer channel (standard), selecto channels ... see 3145.

S/360 mdt 145-3 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3145-3.

S/360 mdt 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/360 mdt 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

S/360 mdt 165, 168 -- selector channel of 2860, basic multiplexer channel of 2870, Selecto Subchannels (special features) on 2870 ... see 2860, 2870.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional).

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard).

Note: Before ordering, read descriptions of #7720 and #7730 under "Special Features" below for further prerequisites and limitations.

1401/1460 -- one 1419 can be attached. A Serial I/O Adapter (#7080) is required on the 1401 or 1441 Processing Unit. Note: For optimum operation, Processing Overlap (#5730) is recommended on the 1401 or 1461 I/O Control. Without it, a maximum of 9.5 milliseconds are available for processing of data from the 1419. Limitations: A 1419 cannot be installed with 1401 A, G or H models ... on a 1401, diagnostic programs require a minimum of 4.000 positions of storage.

1410 -- one 1419 can be attached to each channel ... simultaneous use of two 1419s increases the number of documents convertible up to 90%, exclusive of operator handling time. A Magnetic Character Reader Adapter (#4900, 4902, 4903) is required on the 1411 Processing Unit. Limitation: Can be installed only on 1411 mdls A thru A5.

Limitations:

S/360 mdt 25, 30 -- operation of 1419s is not included under 1401/1440/1460 Compatibility features.

S/360 mdt 40 -- operation of 1419s is not included under 1401/1440/1460 Compatibility (#4457) or 1410/7010 Compatibility (#4478).

S/360 mdt 50 -- operation of 1419s is not included under 1410/7010 Compatibility (#4478).

S/360 mdt 67 -- only when operating in md5 65 mode.

S/360 mdt 115 -- operation of 1419s is not included under S/360 Mdt 20 Compatibility (#7520).

S/360 mdt 125 -- operation of 1419s is not included under 1401/1440/1460 Compatibility (#4457) or S/360 Mdt 20 Compatibility (#7520).

S/360 mdt 135, 135-3, 138 -- operation of 1419s is not included under 1401/1440/1460 Compatibility (#4457).

S/360 mdt 145, 145-3, 148 -- operation of 1419s is not included under 1401/1440/1460 Compatibility or 1401/1440/1460, 1410/7010 Compatibility (#4458).

S/360 mdt 155, 158 -- operation of 1419s is not included under 1401/1440/1460, 1410/7010 Compatibility (#3950).

4331 Processor -- operation of 1419s is not included under 1401/1440/1460 Compatibility (#3950).

Bibliography:


Specify: [1] Voltage (AC, 1-Phase, 60 Hz): #9092 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color: Color Accent -- #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. Extended Color -- #9031 for red, #9032 for yellow, or #9033 for blue.

[3] Field Lengths: Specify feature #s, one for Account Number, one for Process Control ... see table below. Fixed field lengths assure maximum processing accuracy. Variable length fields may be specified in lieu of fixed lengths. Field lengths on installed machines may be changed.

<table>
<thead>
<tr>
<th>Fixed Field Length (pos)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account Number</td>
<td>9210</td>
<td>9211</td>
<td>9212</td>
<td>9213</td>
<td>9214</td>
<td>9215</td>
<td>9219</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process Control</td>
<td>9190</td>
<td>9191</td>
<td>9192</td>
<td>9193</td>
<td>9194</td>
<td>9195</td>
<td>9189</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[4] Shipping Instructions: #8991 for stackers assembled (sorter section 35-3/4" deep), or #8992 for stackers disassembled (sorter section approximately 32" deep).

[5] Up-ending Kit (sorter section only): #8940, if required ... loan basis on initial machine order only, remains property of IBM. Note: also see [9] below.
1419 Magnetic Character Reader (cont'd)

6 System 360 Model 20 Attachment; #9710. See SGD sales manual for details. With #9710 installed, the 1419 cannot be used interchangeably with a 1400 series processor or a S/360 mdl 22, 25, 30, 40, 50, 65, 67, any S/370 Processor or any 4300 Processor.

7 Kickstrips: #9431, if desired ... When kickstrips are installed, the open area under the machine is enclosed. This reduces the amount of 'toe-room' for the operator and may be inconvenient to the customer if the power outlet is located under the machine.

8 Isolation Feature: May be required on units shipped prior to December 29, 1967 for attachment to a S/360 ... see "Special Features." 

9 Crane/Hoist Cable: #9070 ... specify only if delivery of machine requires lifting by crane or hoist. Loan basis on initial machine order only, remains property of IBM. Prerequisite: Up-ending Kit (#9840).

10 Prices: 

<table>
<thead>
<tr>
<th>Machines</th>
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<td>1419</td>
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<td>$120,100</td>
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Plan Offering: Plan A. Additional Use Charge Rate: 30%

Metering: 1/0 Unit (Online/Offline)

Maintenance: C

Purchase Option: 50%

Warranty: B

Per Call: 3

SPECIAL FEATURES

Batch Numbering (#1445). Provides an automatic means of advancing a batch number without identification under program control. Consists of a 6-position impact printer which prints up to 999,999. The five low-order digits are advanced under processor control ... the high-order digit is advanced manually. The batch number can be printed in any one of six locations on the back of the document. Limitations: [1] Batch number advance instructions given more often than once in a given three second period will cause suspension of feeding for remainder of period. Minimum batch sizes that can be processed without restriction are influenced by those factors affecting throughput. Refer to Reference Manual ... [2] Legibility of batch numbers is influenced by the quantity of reverse side printing, and surface irregularities caused by the printing process used. Typical examples of documents with one or more surface irregularities are Traveler's and Certified Checks. Customers must be advised that on these types of documents reduced ribbon life can be expected ... [3] When 51-column cards are processed, print location 6 cannot be used ... [4] This feature is not available for use in 1410 systems ... [5] Cannot be installed with Endorser (#3791). Uses purple ribbon (#13193), or equivalent. See SRL GA24-3342 for details. Prerequisite: For field installation, 1419 must have EC 127244 or above.


ElectroniC Accumulator and Sequence Checking ( #1460). Plant installation only) Accumulating -- amounts read from documents and accumulated total printed on paper tape. Maximum accumulation is ten digits. Rejected documents not accumulated. Sequence Checking -- selected positions in a field compared with same positions in preceding documents to assure that all documents are in proper order. Maximum of ten positions can be checked in single pass. Limitation: This feature does not function when 1419 operates in "on line" mode with any S/360, S/370 or 4300 Processor. Note: This feature is a separate unit, cable connected to 1419 17" x 20-1/2" x 38-1/2" ... weight, 105 lbs. Prerequisite: Multiple Column Control (#5201).

Endorser (#3791). [Plant installation only] Imprints full endorsement at speed of 1419. Operator can select one of six endorsement positions in accordance with ABA specifications. With this feature, documents can be endorsed with date, identification number and bank's legal endorsement. The Endorser Plate is made to the customer's specifications. See "Accessories" below. A Blank Endorser Plate is also available if only partial endorsements are required. Specify: #9167 for endorsement at top, #9618 for center, or #9169 for bottom. Limitation: Cannot be installed with Endorser (#3791).

Expanded Capability (#3800). Provides a command for operation under OS. When in OS mode, stacker selector time available using the Dual Address Adapter is reduced by 7 ms. Exposure to data overruns caused by 1419s interfering with other 1419s operating on the same channel is eliminated. Overflow exposure and maximum number of 1419s per channel depending on configuration and application dependent ... refer to SRL GC21-5006. Compatibility with DOS Dual Address Support is provided for compatibility to OS. OS or DOS mode of operation is established by a field modification to the feature by FE. Prerequisites: Each 1419 requires the Dual Address Adapter (#7730) ... EC 259399 is required on a S/360 mdl 50, and EC 712871 is required on a S/360 processor for a S/360 mdl 65 or S/370 mdl 165.

51-Column Card Sorting (#3480). For sorting 51-column cards, may be intermixed with documents and cards within the specifications listed under "Documents" above. When installed, machine speed is reduced. Formula for calculating feeding rate is: 

$$15,720 + (L \times .725)$$

where L is document length in inches.

For 51-column cards, speed is approximately 1,875 documents/minute ... for 6-inch documents, approximately 1,515 documents/minute. Decks containing 51-column cards must be mechanically joggled prior to feeding.

Isolation, Control Unit (#4700). [Field installation on units shipped prior to December 29, 1967 only ... standard on units shipped after that] To turn power on or off on the 1419 without generating spurious signals. Thus, it can be logically disconnected from the system before power is turned off, can continue operating. Prerequisites: S/360 Adapter, Single Address (#7720) or Dual Address (#7721) ... is installed, the 1419 cannot be used with a 1400 series processor. Maximum: One.

Multiple Column Control (#5201). To select documents with specific number in four or less columns of any field.

Program Control for Pocket Lights (#5739). To facilitate control of output batches in the transit application. On 1419s attached to S/360, S/370, 4300 Processor, 1401 and 1460, the program stops the 1419 when a predetermined number of documents has entered one of six pockets designated for the program and turns on the appropriate pocket light(s) [A-3]. Limitation: Not available for use in a 1410 system.

Program Control for Pocket Lights, 7-12 (#5741). Facilitates control of output batches in the transit application when more than six pockets are being filled. Provides lights for pockets 4-9, enabling program to turn on light(s) for any of the first twelve pockets as designated. Limitation: Not available for use in a 1410 system. Prerequisites: Program Control for Pocket Lights (#5739), plus EC 125358A, or, for field conversion, FBM 488231.

Self-Checking Number (#7061, 7062). A self-checking number consists of two parts, the basic identifying number and its self-checking digit. The check digit, derived from the basic identifying number by one of two techniques, is always the units digit of a self-checking number. The check digit is not included in a self-checking number which has been correctly recorded. The field is verified as it is read during any pass. Limitation: Self-checking numbers for Modulus 10 are not compatible with those for Modulus 11.

#7061 - Modulus 10 -- has weighting factor of 1, 2, 1, 2, 1, 2. Will not detect the following errors: 09 or 90 transposition ... interchange of digits between alternate columns, 32647 for 34627 ... substitution of one self-checking number for another ... in some instances, transpositions having the formula "BAB" for "ABA" ... in some instances, random errors, e.g., 23 printed as 56.

#7062 - Modulus 11 -- has weighting factor of 7, 6, 5, 4, 3, 2 ... when self-checking number is greater than six digits, weighting factor is repeated. In some instances, random type errors will not be detected, nor can a basic number requiring a digit of 10 be used.

Split Field (#7440). The first ABA dash symbol following a digit (e.g., a dash in units position of a field is ignored) will separate the field into two elements. Each of the elements may vary in length. With this feature, either element can be treated as a separate field. Specify First Element (#9180) ... required when Self-Checking Number (#7061, 7062) is ordered and is to operate only on the first element of the split field.

S/360 Adapter (#7720 for Single Address, #7730 for Dual Address). One of these adapters is required on each 1419 attached to a S/360 mdl 22, 25, 30, 40, 50, 65 or 67, any S/370 Processor or any 4300 Processor. Limitation: Once #7720 or #7730 has been installed, the 1419 cannot be used with a 1400 series processor. Maximum: One

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S/360 Adapter - Single Address (#7720) — up to six 1419s attached to a system are supported by DOS. Exposure to late stacker select should be considered in determining the maximum number of 1419s that may effectively operate on a system, in addition to those factors outlined under DOS in "Programming." Limitation: Programming support precludes concurrent operation of 1419s equipped with #7720 and those equipped with #7730. 

Prerequisites: In order to operate with DOS or BPS, Direct Control (#3274) or External Interrupt (#3895) is required on the processing unit. Note: Intersystem attachment via Direct Control is limited when the 1419 uses external interrupt lines. Signals in lines used by 1419s cannot be shared with the second processing unit. To operate with DOS, the 1419 must have EC 131182. When equipped with #7720, it is recommended that 1419s be attached to a multiplexer channel and should normally be the highest priority devices on the channel.

S/360 Adapter - Dual Address (#7730) — with this feature more stacker select time is based on the last field selected for reading; account number — 27 ms, transit number — 21 ms, serial number — 15 ms. In order for these times to be valid, document field placement must be within ABA Common Machine Language Specifications. The feature includes two distinct control units, each with a separate address, its own set of executable commands, and status and sense indicators. Prerequisites: If the 1419 is attached to a 2022 or 2030 multiplexer channel via #7730, 1419 Dual Address Compatibility (#9185) must be specified on the 2022 or 2030. If #7720 is changed to #7730 by MES, #9185 must be added to the 2022 or 2030.

-------- DOS --------

Up to six 1419s attached to a system are supported by DOS. The limiting factors concerning the number of 1419s that may be attached to a system are stacker select time requirements and channel capacity. Since these factors are application and configuration dependent, consult the appropriate channel loading and DOS SRLs to determine the maximum number that may be operated effectively. Limitation: DOS support precludes concurrent operation of 1419s equipped with #7730 and those equipped with #7720. 1419s equipped with #7730 can be attached only to a multiplexer channel and should normally be the highest priority devices on the channel. Prerequisites: Direct Control (#3274), External Interrupt (#3895) or External Signal (#3898) is required on the processing unit (except the 4341 Processor). Note: Intersystem attachment via Direct Control is limited when the 1419 uses the external interrupt lines. Signals in lines used by 1419s cannot be shared with the second processing unit. For field installation of #7730, the 1419 must have EC 131196 or above.

-------- OS --------

Limitation: 1419s equipped with #7730 (required for OS) can be attached only to a multiplexer channel, must be physically cabled last on the channel, and should be the highest priority devices on the channel. Prerequisite: For operation under OS, each 1419 must be equipped with Expanded Capability (#3800).

Special Feature Prices:

```
MAC/  MRC    Purchase  MMC  FIC
-------  ------  --------  ----  -----
Batch Numbering  #1445  $145  $6,805  $15.00  $75.00
Dash Symbol Trans  3219  598UC  38  NC  21
Elec Acc & Seq Ck  3610  293  10,620  31.00  PO
Endorser  3791  441  19,950  55.00  PO
Endorser Only  3795  293  13,100  35.50  PO
Expanded Capability  3800  181  8,185  1.00  108
51-col Card Sorting  4380  NC  NC  NC
Isolation, Control Unit  4700  NC  NC  NC
Multiple Column Cntr  5201  58  2,445  3.00  189
Program Control for Pocket Lights
pockets 1-6  5739  30  1,080  1.00  113
pockets 7-12  5741  10  426  1.50  65
Self-checking Number
Modulus 10  7061  46  2,110  2.50  32
Modulus 11  7062  75  3,260  3.50  26
Split Field  7440  22  1,335  1.50  26
S/360 Adapter
Single Address  7720  116  5,770  10.00  966
Dual Address  7730  315  14,210  13.00  966
```

Accessories: The following items are available on a purchase only basis. For shipment with machine, order the desired Feature # indicated below at the price listed in M10000 pages.

Endorser Plate (#3792) ... for use with #3791 or #3795.
Blank Endorser Plate (#3793) ... for use with #3791 or #3795.

Note: When ordering #3792, it is recommended that at least one spare plate be stocked, as they cannot be immediately replaced.

See M10000 pages for description, ordering instructions, and field installation.

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1441 PROCESSING UNIT
(No longer available)

Core Storage Positions Storage Cycle Rate System
(alphanumeric) (milliseconds)
A2 2,000 - 1440
A3 4,000 - 1440
A4 8,000 - 0.1111
A5 12,000 -
A6 16,000 -
C4 8,000 -
C5 12,000 -
C6 16,000 -

Model Changes: Any A model can be changed to another A model... any C model to another C model.

The following specifications can be changed in the field.
[1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V... must be consistent with system voltage.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.
[3] Additional Disk Storage: #9010, maximum one. Required when the second 1311 mdl 2 is attached.

Card Image: #9035. Required if Card Image (#1531) is installed on a 1442 mdl 1, 2 or 4.

PRICES: Mdl MAC/ MRC Purchase MMC
1441 A2 $788 $43,570 $81.00
A3 995 46,890 82.50
A4 1,330 64,890 84.50
A5 1,660 82,880 86.00
A6 1,995 100,850 86.00
C4 853 40,030 99.00
C5 1,189 56,120 101.00
C6 1,515 76,120 102.00

Plan Offering: Plan A, Additional Use Charge Rate: 30%
Metering: Base Unit (meter on 1447 mdl 1) Maintenance: B
Purchase Option: 50% Warranty: B Per Call: 3

The following special features are on an "as available" basis for field installation.

GENERAL PURPOSE FEATURES

BIT TEST (#1470). To test any position in storage for any bit.

INDEXING AND STORE ADDRESS REGISTER (#4631). [A mdl only... standard on C mdls] Includes the following instructions: Indexing... -- three index locations provided to modify addresses automatically. Store A-Address Register - Q (AAA) -- stores contents of "A" address register in (AAA) prior to reading next instruction. Store B-Address Register - H (AAA) -- stores contents of "B" address register in (AAA) prior to reading next instruction.

MULTIPLY-DIVIDE (#5275). Provides the following: Multiply... an area of core storage must be set aside equal in length to combined lengths of multiplier and multiplicand, plus one. This area, or "B" field... field is used to hold multiplier in high-order positions and develop product in low-order positions. Multiplicand is placed in "A" field. After multiplier has been moved to high-order positions of "B" field, multiply operation is executed. Upon completion, product is available beginning with units position of "B" field. Speed depends upon sizes of multiplier and multiplicand, e.g., a 6-position field multiplied by a 4-position field requires 1.89 milliseconds. Divide -- a field in which the quotient will be developed is set aside immediately to the left of the dividend field. This field must be equal in length to dividend field. Divisor can be any other place in storage. After divide operation is executed, quotient is available beginning with units position of field set aside for it... remainder beginning with units position of dividend field. Speed depends upon length of expected quotient.

CARD I/O FEATURE

PUNCH COLUMN SKIP CONTROL (#5881). Required for Punch Column Skip (#5860) on 1442 Card Read Punch mdl 1 or 2... only one #5881 is required for #5860s on 1442s.
EXPANDED SERIAL INPUT/OUTPUT ADAPTER (#3845). [mdls A3-A6 only]. To attach the 1441 (1440) directly to a 1411 or 7114 Processing Unit (1410 or 7010). This feature can also be used in lieu of a Serial I/O Adapter (#7080) for any of the attachments possible via #7080 ... #3845 and #7080 cannot both be installed. See SRL Reference Manual for details. Specify: Length of cable, to a maximum of 100 feet.

Prerequisites: Bit Test (#1470) and Indexing and Store Address Register (#4631) ... Control Adapter (#1067,1068) on 1411 or 7114 ... Control Adapter (#1067,1068) on 1411 or 7114 ...

Priority Feature (#5620) and Processing Overlap (#5730) on 1411.

INTERRUPT (#4708). Allows processor to perform shared time operations. More time can be spent on processing and less on 1026 Transmission Control Unit operations. Programmed Instructions which continuously test for line service will not be required.

Prerequisite: Transmission Control Unit Attachment - 1026 (#8024).

TIME Emitter (#7958). Causes a processor interrupt every 3.6 seconds for program simulation of a real time clock and/or interval timers.

Prerequisite: Interrupt (#4708).


TRANSMISSION CONTROL UNIT Attachment - 1026 (#8024). [Not available for mdl A2] To attach up to four 1026 Transmission Control Units and the 1447 Console mdl 1, and, if desired, a 1447 mdl 2. Limitation: Cannot be installed with Transmission Control Unit Attachment - 1448 (#8025) or Console Attachment (#8026).

Prerequisite: In 1440, Indexing and Store Address Register (#4631).

TRANSMISSION CONTROL UNIT Attachment - 1448 (#8025). [Not available for mdl A2 or C mdls] To attach a 1448 Transmission Control Unit. Limitation: Cannot be installed with Transmission Control Unit Attachment - 1026 (#8024).

Prerequisite: Indexing and Store Address Register (#4631).

MAC/ MRC Purchase MMC FIC

Special Feature Prices: Bit Test #1470 $ 20 $ 848 $ 1.00 $ 11

Index & Store Address Register 4631 91 5,080 1.50 28

Multiply-Divide 5275 333 11,950 12.50 309

Card I/O Feature Punch Col Skip Control 5881 10 529 1.00 35

Disk Storage Features Direct Seek 3281 50 2,460 4.00 29

Disk Storage Control 3321 255 12,280 11.00 106

Exp Disk Storage Ctrl 3832 50 2,565 5.50 267

Scan Disk 6396 35 1,720 1.00 9

Seek Overlap Adapter 6399 NC NC NC NC

Track Record 8011 40 1,960 1.00 9

Printer Features Expanded Print Edit 3835 20 795 1.00 14

Printer Attach (for 1440) 5561 25 1,410 1.00 26

Magnetic Tape Feature Tape Adapter 7802 118 7,295 2.50 162

Serial Input/Output Feature Serial I/O Adapter 7080 101 3,845 2.00 80

Data Transmission Features Console Attachment 2260 40 2,250 1.00 31

Direct Data Channel 3271 NC NC NC NC

Expd Serial I/O Adptr 3845 333 12,470 2.50 80

Interrupt 4708 101 4,825 1.50 21

Time Emitter 7958 10 476 1.00 44

Translation Feature 8023 81 3,075 3.00 88

Transmission Control Unit Attachment for 1026(s) 8024 50 2,670 1.00 71

for 1448 8025 152 6,920 2.50 101

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1442 CARD READ PUNCH - Models 1, 2 and N1

**Purpose:** A combination punched card I/O unit for a 1240, 1440, 1450, S/360 mdl 22 thru 85 and 195, any S/370 Processor or any #430 Processor.

**Model 1** [No longer available]: For 1240, 1440 or 1450 ... readings at rated speed of 300 cards/minute ... punches at rated speed of 80 columns/second ... has one stacker.

**Model 2** [No longer available]: For 1240, 1440 or 1450 ... readings at rated speed of 400 cards/minute ... punches at rated speed of 160 columns/second ... has two stackers.

**Model N1** For S/360, S/370 or 4300 Processor ... reads at rated speed of 400 cards/minute ... punches at rated speed of 160 columns/second ... has two stackers.

**Model Changes:** Can be made between mdl 1 and 2 ... a mdl 1 or 2 can also be changed to a 1442 Card Reader mdl 4, but with vice versa ... no changes can be made to or from a mdl N1

**Highlights:** Format control and analysis are controlled by the system’s processing unit. Model N1 reads and punches the 256 codes of the Extended BCD Code. Hopper capacity is 1,200 cards ... stacker capacity is 1,300 cards. In mdl N1, cards go to stacker 1 unless program directed to stacker 2. Model N1 contains its own control unit.

**Input Section** -- invalid codes and mispositioned cards are detected ... The light-sensing mechanism is checked for proper functioning in every read cycle.

**Output Section** -- cards are punched serially after passing through the light-sensing station. Cards can be either blank or pre-punched. Actual punching speed depends upon the number of columns punched, including interspersed blank columns. Rated speed for punching columns 1-10 is 265 cards/minute for mdl N1, for punching columns 1-80 is 91 cards/minute for mdl N1. Punching is checked.

**Card Limitations** -- generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved.

**Internal Scores (before separation) -- S-1, ID-1, ID-2, and for a maximum of three passes, M-4 and M-5.

**External Scores (after separation) -- for reading and punching: On column 80 end -- M-3, M-7, M-11 (with round corners) or CF-11 (with round corners); On column 1 end -- an M-7, M-11 (with round corners) or CF-11 (with round corners) score may be used on a mdl N1 with serial no. 40044 or above, or a machine having punch unit serial no. 2638 or above stamped on the back of the tie bar. For reading without punching: On column 80 end, and for a maximum of three passes, M-5, OM-2 and CF-4.

All other scores may result in unsatisfactory performance.

**PREREQUISITES:** For S/360, S/370 or 4300 Processor -- a control unit position on a system channel.

**S/360 mdl 25 -- special feature on 2025: Multiplexer Channel or Selector Channel ... see 2025.

**S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), or Selector Channels (special features), except on 2022 one selector channel is standard ... see 2022, 2030, 2040, 2050.

**S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add1 High Speed Multiplexer Subchannels ... see 2044.

**S/360 mdl 65, 67, 75 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

**S/360 mdl 85, 195 or S/370 mdl 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, or shared subchannel of a 2880 ... see 2860, 2870, 2880.

**S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

**S/370 mdl 135 -- multiplexer channel (standard), Selector or Block Multiplexer Channels (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), block multiplexer channels (special features) ... see 3135-3.

S/370 mdl 128 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3135.

S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), or block multiplexer channel (first three are standard) ... see 3155, 3158.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard) block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channels (optional).

4331 Processor -- byte multiplexer channel (standard), block multiplexer channels (two or more standard) ... see 4331.


The following specifications can be changed in the field (also applies to mls 1 and 2).

**Specify:** [1] Voltage: Models 1 and 2 (AC, 3-phase, 4-wire, 60 Hz) -- #9903 for 208 V, or #9905 for 230 V ... Model N1 (AC, 1-phase, 3-wire, 60 Hz) -- #9902 for 208 V, or #9904 for 230 V

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or (mdl N1 only), #9046 for white.

[3] 1442 N1 Compatibility Attachment (mdl N1 only): May be required ... see “Special Features.”

[4] Isolation Control Unit (mdl N1 only): May be required on units shipped prior to December 29, 1967 ... see “Special Features.”

**PRICES:** Mdl MRC Purchase MMMC

1442 1 $ 352 $14,280 $68.00

2† 498 15,130 83.00

N1 661 19,990 152.00

Plan Offering: Plan A, Additional Use Charge Rate: 30%

Maintenance: C

Purchase Option: 45%

Warranty: B

Per Call: 3

**SPECIAL FEATURES**

**NOTE:** On a 1442 mdl 1 or 2, the following features, as appropriate, are on an “as available” basis for field installation.

**CARD IMAGE:** In any system -- permits processing of cards with multiplexer punching in a single card channel. In 1240, 1440 or 1450 -- converts binary coded cards into BCD codes, and vice versa ... approved scored cards can be read without suspending validity checking on other than scored columns ... cards with interspersed conventional codes and binary coded data can be read.

**#1531 -- for mdl 1 or 2 ... #1532 -- for mdl N1.

When reading in card image mode, the validity check is suspended because all characters are considered valid. When installed on the first 1442 attached to a 1240, 1440 or 1450, this feature also functions on a second 1442. **Prerequisite:** For mdl 1 or 2 -- Card Image (#9035) on the 1241 or 1441 ... see “Specify” under 1241 or 1441.

1442 N1 COMPATIBILITY ATTACHMENT (#4445). [Mdl N1 only] Required if the 1442 mdl N1 is to be used with 1440 Compatibility (#4442) on a 2025, or with 1442/1443 Attachment (#4454) or 1620 Compatibility (#7190) on a 2030. Required only for operation in compatibility mode, not required for normal S/360 operation of the 1442 mdl N1. **Limitation:** Cannot be installed on a unit with serial no. under 40100.

**ISOLATION, CONTROL UNIT (#4700). [Mdl N1 only ... for field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off the 1442 mdl N1 without generating spurious signals, Thus, a Processor program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Limitation:** Cannot be installed on a unit with serial no. under 40106. **Prerequisite:** in all cases there are compatible EC level

† No longer available.
1442 Card Read Punch - Models 1, 2 and N1 (cont'd)

Prerequisite: Punch Column Skip (#5880) on the 1241 or 1441 ... only one #5881 is required if #5880 is installed on two 1442s.

**SELECTIVE STACKER (#6406).** [Mdl 1 only] Provides a second stacker ... cards can be selected into this stacker under program control.

---

**Special Feature Prices:**

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<th>Feature</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
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<td>25</td>
<td>831</td>
<td>1.00</td>
</tr>
</tbody>
</table>

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**1442 CARD READER - Models 3 and 4**

- **Model 4** For 1240 or 1440 ... has two stackers.
- **Model Changes:** A 1442 Card Read Punch mdl 1 or 2 can be field changed to a 1442 Card Reader mdl 4, but not vice versa.
- **Highlights:** Provides high-speed, low-cost punched card input. Cards are read by a light-sensing unit at speeds up to 400 cards/minute. The 64 codes of the BCD Code can be read. Invalid codes and mispositioned cards are detected. The Light-sensing mechanism is checked for proper functioning in every read cycle. Has a 1,200-card capacity hopper and two 1,300-card capacity radial stackers.
- **Card Limitations:** Generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved.
  - **Internal Scores** (before separation) — S-1, ID-1, ID-2, and for a maximum of three passes, M-4 and M-5.
  - **External Scores** (after separation) — column 1 end: OM-2, M-3, M-4, M-5, M-7, M-11 (with round corners), CF-4 and CF-11 (with round corners), ... column 80 end: M-3, M-6, M-7, M-11 (with round corners), CF-11 (with round corners), and for a maximum of three passes, M-5, OM-2, CF-4.
- All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner cut cards cannot be used.

**Maximum:** Up to two 1442 mds 4s can be attached to a 1240 or 1440 system.

**Limitations:** On a 1240 or 1440, if a 1442 Card Read Punch mdl 1 or 2 or a 1444 Card Punch is used, only one 1442 mdl 4 can be installed ... if two 1442 mds 1s and 2s in any combination or both a 1442 mdl 1 or 2 and a 1444 are used, a 1442 mdl 4 cannot be installed.

**Prerequisite:** For 1240 or 1440 ... the first 1442 (mdl 1, 2 or 4) attached to the system must have a Card Read Punch Adapter (#1632) ... see "Special Features."

**Bibliography:** GA22-3005

The following specifications can be changed in the field.

1. Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208V, or #9005 for 230 V.
2. Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl 3 or 4</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1442</td>
<td>$249</td>
<td>$8,720</td>
<td>$77.50</td>
<td></td>
</tr>
</tbody>
</table>

**Rental Plan:** Plan A, Additional Use Charge Rate: 30% Maintenance: C

**Purchase Option:** 45% Warranty: B Per Call: 3

**SPECIAL FEATURES**

The following features, as appropriate, are on an "as available" basis for field installation on a 1442 mdl 3 or 4.

**CARD IMAGE (#1531).** [Mdl 4 only] To convert binary coded cards into BCD codes ... also permits processing of cards with multiple punching in a single card column. Approved scored cards can be read without suspending validity checking in other than the scored columns. When reading in card image mode, the validity check is suspended because all characters are considered valid. Cards with interspersed conventional punching codes and binary coded data can be read. When installed on the first 1442 attached to a system, this feature also functions on a second 1442 in the system. **Prerequisite:** Card Image (#9035) on the 1241 or 1441 ... see "Specify" under 1241 or 1441.

**CARD PUNCH ADAPTER (#1632).** [Mdl 4 only] Required on the first 1442 attached to a system ... the second 1442 does not require this feature. When a 1442 mdl 1 or 2 and a 1442 mdl 4 are both attached to a system, the 1442 mdl 1 or 2 must be the first unit attached and must be equipped with this feature.

**INPUT/OUTPUT ADAPTER (#4661).** [Mdl 3 only] To attach a 1414 I/O Synchronizer mdl 5 or 8 with the teleprocessing units or printer it controls to the 1442 mdl 3.

**SPECIAL FEATURE PRICES:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card Image</td>
<td>#1531</td>
<td>$1,260</td>
<td>$1.00</td>
<td>$35</td>
</tr>
<tr>
<td>Card Read Punch Adptr 1632</td>
<td>1632</td>
<td>25</td>
<td>1,260</td>
<td>1.00</td>
</tr>
<tr>
<td>Input/Output Adptr 4661</td>
<td>4661</td>
<td>64</td>
<td>2,095</td>
<td>1.25</td>
</tr>
</tbody>
</table>

† No longer available.
Models 5 and N2
the number of 1442 mdl N2s that can be attached
multiplexer channel (standard), 2nd Byte
to multiplexer channel (standard), block
channel (standard), selector channel
M-4, M-5,
any
columns/minute: Columns 1 thru 85 to columns/second.
Highlighted Features:
Format control and analysis are performed by the
Model's processing unit. Blank or prepunched cards are punched
serially.
Maximum:
Rated speed of
any
cards/minute: Columns 1 thru 85 to columns/second.
Maximum:
S/360 mdl 20 -- one 1442 mdl 5 can be attached to the 2020
Processing Unit ... see S/360 mdl 20 in GSD sales manual for
allowable I/O unit configurations.
S/360 mdl 22 thru 75, any S/370 Processor and any 4300
Processor -- the number of 1442 mdl N2s that can be attached
depends upon the number of available system channel control
unit positions.
PREREQUISITES:
S/360 mdl 20 -- a 2020 Processing Unit submodel 1, 2, 5 or 6
equipped with a 1442 Model 5 Attachment (#4460) ... if the
installed 2020 has a serial no. under 20000, a Cable Adapter
(#9099) is required on the 1442. See "Specify" below.
S/360 mdl 22 thru 75, any S/370 Processor and any 4300
Processor -- an available control unit position on a system channel.
S/360 mdl 25 -- special feature on 2025: Multiplexer or Selector
Channel ... see 2025.
S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), or
Selector Channels (special features, except on 2022 one selector
channel is standard) ... see 2022, 2030, 2040, 2050.
S/360 mdl 44 -- special features on 2044: Multiplexer Channel,
High Speed Multiplexer Channels, or Add1 High Speed Multiplexer
Subchannels.
S/360 mdl 65, 67, 75 -- selector channel of 2860, basic multi-
plexer channel of 2870, or Selector Subchannels (special features)
on 2870 ... see 2860, 2870.
S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see
3115, 3125.
S/370 mdl 135 -- multiplexer channel (standard), Selector
Channels or Block Multiplexer Channels (special features) ... see
3135.
S/370 mdl 135-3 -- byte multiplexer channel (standard), Block
Multiplexer Channels (special features) ... see 3135-3.
S/370 mdl 138 -- byte multiplexer channel (standard), block
multiplexer channels (standard) ... see 3138.
S/370 mdl 145 -- multiplexer channel (standard), selector
channels ... see 3145.
S/370 mdl 3145-3 -- byte multiplexer channel (standard), block
multiplexer channels ... see 3145-3.
S/370 mdl 148 -- byte multiplexer channel (standard), block
multiplexer channels (standard) ... see 3148.
S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte
Multiplexer Channel (special feature), block multiplexer channels
(first two are standard) ... see 3155, 3158.
S/370 mdl 165, 168 -- selector channel of 2860, basic multi-
plexer channel of 2870, Selector Subchannels (special features)
of 2870, or the shared subchannel of a 2880 ... see 2860, 2870, 2880.
3031 or 3032 Processor -- byte multiplexer channel (one is
standard), block multiplexer channels (five are standard) ... see
3031 or 3032.
3033 Processor -- byte multiplexer channels (two are standard),
block multiplexer channels (ten are standard) ... see 3033.

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1443 PRINTER

Purpose: Printed output unit for a 1450, S/360mdl 22 thru 85, 195, any S/370 Processor or any 4300 Processor.

Model 3 [No longer available] For 1450 ... 140 lpm rated speed with 52-character set.

Model 4 [No longer available] For 1450 ... 230 lpm rated speed with 52-character set.

Model N1 For S/360 mdl 22 thru 85, 195, any S/370 Processor or any 4300 Processor ... 240 lpm rated speed with 52-character set.

NOTE: For speeds with other character sets, see Selective Character Set (#6402) under "Special Features."

Model Changes: Models 3 and 4 have 144 print positions ... standard on all other models are 120 print positions. On all models the 52-character set is standard. Actual speed depends upon the operation ... see Selective Character Set (#6402) under "Special Features." The system's processing unit performs all format and analysis control. A line of printing is presented to the printer in the arrangement in which it is to be printed.

Each print position can print any of 52 characters ... alphabetic, numeric and 16 special characters. Characters are spaced 10/inch. Line spacing is 6 or 8 lines/inch, under operator control. Marginally punched continuous forms from 4" to 16-3/4" in overall width are fed by an automatic carriage. Maximum form depth is 22" at 6 lines/inch ... 16-1/2" at 8 lines/inch. Forms spacing and skipping are controlled by a 12-channel tape in the carriage. Skipping is at approximately 15'/sec.

An enlarged dash (character no. 630704) is available for printing on documents to be read by 1230, 1231 and 1232 optical mark readers. Depending upon the system, see appropriate section of "Type Catalog" for ordering instructions. The ribbon used on the 1443 must be capable of producing printed characters suitable for recognition by the optical reader used.

Limitations: When a model change is made between a mdl 3 and 4, serial no. 10330 and below, type bars (less segments) must be replaced. Replacement bars will be furnished at no charge on a one-for-one basis. Previously installed segments will be installed in the new type bars without charge. Submit MES, indicating: (a) Model change from 3 to 4, or vice versa. (b) Feature # and quantity of each character set requiring a new typar. (c) Feature # for type size, #9731 for .079", or #9733 for .095".

A 120 print-position bar cannot be used in a machine equipped with Print Positions, 24 Add'l (#5558) unless one additional segment is added and all segments are rearranged in the required sequence ... conversely, a 144 print-position bar cannot be used in a 120 print-position machine unless one segment is removed and the remaining segments are rearranged in the required sequence ... see "Type Catalog."

Neither segments nor type bars are interchangeable between any model 1443 and 2203 Printers.

PREREQUISITES: For 1450 -- attachment features are standard on the 1443 and the 1443, Limitation: Only one printer, a 1443, can be attached to a 1450 system.

For S/360, S/370 and 4300 Processors -- the 1443 mdl N1 includes its own control. It requires a control unit position on a system channel.

S/360 mdl 25 -- special features on 2025: Multiplexer Channel, or Selector Channel ... see 2025.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), or Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add'1 High Speed Multiplexer Subchannels ... see 2044.

S/360 mdl 65, 67, 75 -- selector channel of 2860, basic multiplexer of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195 -- selector channel of 2860, basic multiplexer of 2870, Selector Subchannels (special features) on 2870 or the shared subchannel of a 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channels (special features), or Block Multiplexer Channels (special features) ... see 3135.

S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 145 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3145.

S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158, 3158-3.

S/370 mdl 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) of 2870, or shared subchannel of 2880, ... see 2860, 2870, 2880.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033, 4331, 4341 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331, 4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.


Specify: [1] Voltage: For 1450 (AC, 3-phase, 4-wire, 60 Hz) -- #9903 for 208 V, or #9905 for 230 V. For S/360 or S/370 (AC, 1-phase, 3-wire, 60 Hz) -- #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color: #9004 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Print Arrangement for standard 62-character set unless Selective Character Set (#6402) is ordered and the 63-character set is desired instead ... see appropriate section of "Type Catalog" (page 41 or 41) depending upon the system involved. Character substitutions are also covered in the "Type Catalog."

[4] Type Size: #9731 for .079", or #9733 for .095".

[5] Order Tape Punch, Part No. 120910, if 1443 is for New Account Name ... one is furnished at no charge per installation.

[6] Isolation, Control Unit (mdl N1 only) ... May be required on units shipped prior to December 29, 1967 ... see "Special Features" below.

FTP/--
MAC/ MLC MLC
MRC 1 yr 2 yr Purchase MMMC

1443 31 41 $465 -- $23,360 $107.00
41 741 -- 37,030 156.00
N1 954 878 801 41,000 149.00

Plan Offering: Plan A, Additional Use Charge Rate: 30% Metering: I/O Unit (Online) Warranty: B Maintenance: C Purchase Option: 45% Upper Limit Percent: 0% Per Call: 3 Termination Charge Months: 5 Termination Charge Percent: 25% Model/Feature Charge in lieu of All Charge: 10%

SPECIAL FEATURES

CHARACTER SETS #1890-1893, #1905-1996 for mdl 3 or 4 ... #1901-1904 for mdl N1. See "Type Catalog" for graphics and ordering instructions. Prerequisites: On mdl N1, Selective Character Set (#6402) is required for any character set other than #1903.

ISOLATION, CONTROL UNIT (#4700). [Mdl N1 only ... field installation on units shipped prior to December 29, 1967 only ... standard on units shipped after that] To turn power on or off on the 1443 mdl N1 without generating spurious signals. Thus, a Processor program, if it can be logically disconnected from the system before power is turned off, can continue operating. Prerequisites: in all cases there are compatible EC level requirements.

PRINT POSITIONS, 24 ADD'L (#5558). [Standard on mdls 3, 4 ... #5558 -- for mdl N1. Increases print span from 120 positions to 144 positions. Operation of printer remains unchanged. When this feature is field installed, all character sets must be modified. This

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1443 Printer (cont'd)

modification will be made at no charge, provided that only a standard segment is to be furnished ... see "Character Sets" in appropriate section of "Type Catalog." ordering #5558 should include the following: [1] Quantity and feature # of all installed character sets that require an additional segment ... [2] Feature # for type size, #9731 for .079", or #9733 for .095" ... [3] 1443 Type Specifications Sheet (120-0658), if non-standard segments are involved. See "Substitute Characters" in "Type Catalog" for charges that apply.

SELECTIVE CHARACTER SET (#6402). #6402 for mdl N1 ... standard on mdls 3 and 4. Required if any type bar other than the standard 52-character bar is to be used. Provides controls which permit the 1443 to use all available character sets. When ordered for plant installation, the 63-character set may be specified at no charge in lieu of the standard 52-character set for use with this feature. See "Type Catalog" for characters in each set. The various character sets print at the following speeds:

<table>
<thead>
<tr>
<th>Character Set</th>
<th>Mdl 3</th>
<th>Mdl 4</th>
<th>Mdl N1</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>385</td>
<td>565</td>
<td>600</td>
</tr>
<tr>
<td>39</td>
<td>175</td>
<td>285</td>
<td>300</td>
</tr>
<tr>
<td>52</td>
<td>140</td>
<td>230</td>
<td>240</td>
</tr>
<tr>
<td>63</td>
<td>110</td>
<td>190</td>
<td>200</td>
</tr>
</tbody>
</table>

**FTP/---**

MAC/MLC MLC MLC

Special Feature Prices: MRC 1 yr* 2 yr Purchase MMMC FIC

Character Sets ... see "Type Catalog," pg 42 for mdls 3 and 4 ...

Isolation, Control Unit #4700 NC NC NC NC NC NC

Print Positions, 24 add'l for mdl N1

<table>
<thead>
<tr>
<th></th>
<th>5558</th>
<th>48</th>
<th>44</th>
<th>40</th>
<th>$2,290</th>
<th>$3.00</th>
<th>$189</th>
</tr>
</thead>
<tbody>
<tr>
<td>6402</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Selective Character Set

for mdl N1

|          | 6402 | 26   | 24   | 22   | 1,265  | 3.00  | 26   |

* FTP is 12-23 months.

†† No longer available.

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1445 PRINTER -- Model N1

Purpose: Conventional or MICR printed output for a S/360 model 25 or 30.

Highlights: Has 113 print positions. With standard alphameric 56-character set, which includes fourteen E13B symbols, rated speed is 190 lpm. Rated speed can be increased to 240 lpm with a 42-character alphameric set, or 525 lpm with a 14-character numeric set ... see Character Set and Selective Character Set under "Special Features." Actual speed depends upon the operation. The system's processing unit performs all analysis and format control. A line of printing is presented to the 1445 in the arrangement in which it is to be printed.

NOTE: The fourteen E13B symbols are furnished only in the standard 56-character set.

Depending upon the character set used, each print position can print any one of 56 characters ... alphabetic, numeric, six special characters, and the fourteen E13B symbols. Characters are spaced 8/inch. Line spacing is 6 or 8 lines/inch under operator control. Marginally punched continuous paper forms from 4" to 16-3/4" in overall width are fed by an automatic carriage. Maximum forms depth is 22" at 6 lines/inch ... 15-1/2" at 8 lines/inch. Forms spacing and skipping are controlled by a 12-channel tape in the carriage. Skipping is approximately 15" a second. When using the E13B symbols, it is recommended that 24# paper (safety paper, if required by the customer) with a 16-3/4" length be used. ... see MICR Print Quality Considerations.

Two separate ribbon feeds -- one controls a MICR ribbon, the other a conventional ribbon. Only one ribbon feed can be used on the machine at a time. They can be mounted by the operator, depending upon printing requirements.

PREREQUISITE: For S/360 -- a control unit position on a system channel.

S/360 model 25 -- special feature on 2025; Multiplexer Channel, or Selector Channel ... see 2025.

S/360 model 30 -- multiplexer channel (standard), or Selector Channel (special feature) ... see 2030.

Bibliography: GC20-0360

"Voltage" and "Color" can be changed in the field.

Specify: [1] Voltage (must be consistent with system voltage): For model N1 (AC, 1-phase, 3-wire, 60 Hz) -- #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Type Size: #9733 for .095" ... all characters except E13B symbols.


[5] Order Tape Punch, part no. 120910, for all 1445's for a New Name Account ... one per installation is furnished at no charge.

[6] Isolation, Control Unit (model N1 only): May be required on units shipped prior to December 29, 1967 ... see "Special Features.

PRICES: Mdl MRC Purchase MMMMC

MAC/ 1445 N1 $1,540 $67,570 $179

Plan Offering: Plan A, Additional Use Charge Rate: 30% Metering: I/O Unit (Online) Maintenance: C Warranty: B Per Call: 3

SPECIAL FEATURES

CHARACTER SETS (#1898, 1899, 1906). See "Type Catalog," page 91.1 for graphics and ordering instructions. Prerequisite: For #1898 or #1899, Selective Character Set (#6402) is required.

ISOLATION, CONTROL UNIT (#4700). [Model N1 only ... field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 1445 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. Prerequisite: in all cases there are EC level requirements.

SELECTIVE CHARACTER SET (#6402). #6402 for model N1. Required if any type bar other than the standard 56-character bar is used. Provides controls which permit the 1445 to use all available character sets. See "Type Catalog," page 91.1, for characters in each set. The various character sets print at the following speeds:

- 14-character set (numeric) -- 525 lpm.

- 42-character set (alphameric) -- 240 lpm.

- 56-character set (alphameric with E13B symbols) -- 190 lpm.

Special Feature Prices: MAC/ MRC Purchase MMMMC FIC

Character Sets -- see "Type Catalog," page 91.1

Isolation, Control Unit #4700 NC NC NC NC

Selective Character Set for model N1

Price: $28 $1,495 $250 $26

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Add'l High Speed Multiplexer Channels ... see 2044.

S/360 m1d 22, 30, 40, 50 -- multiplexer channel (standard).
Selecter Channels (special features except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

S/360 m1d 65, 67, 75 -- selector channel of 2860, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 m1d 85, 185, or S/370 m1d 165, 168, 195 -- selector channel of 2860, Selector Subchannel (special feature) on 2870, or the shared subchannel of 2870 ... see 2860, 2870, 2890.

S/370 m1d 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125. Note: No DOS support.

S/370 m1d 135, 135-3, 138 -- multiplexer channel (standard) ... see 3135, 3135-3, 3128.

S/370 m1d 145, 145-3, 148 -- multiplexer channel (standard), selector channels ... see 3145, 3145-3, 3148.

S/370 m1d 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158 and 3158-3.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4343.

For Model 3 -- a 2840 Display Control m1d 2.

Bibliography: S/360 --GC20-0360, S/370 -- GC20-001

Specialty: [1] Voltage (AC, 1-phase, 3-wire, 60 cycle) : #9902 for 208 V, or #9904 for 230 V ... see 3070, 2860, 2870, 2890.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Buffer (m1d 1 only): Buffer (#1498 or 1499) is required ... see "Special Features."

[4] Buffer (m1d 1 only): May be required on units shipped prior to December 2, 1967 ... see "Special Features."

PRICES: Mdl M4C/ MRC/ Purchase MMMC

2250 1 $1,185 $57,530 $198

3 1,740 34,830 223

Plan Offering: Plan A, Additional Use Charge Rate: 10% Maintenance: A Per Call: 3 Warranty: B Purchase Option: 40%"
LIGHT PEN (#4785). [Model 1 or 2 only] A hand-held electronic pointer, activated by a foot switch, that allows program detection of lines, characters, and symbols that are displayed on the face of the tube. Limitation: On mdl 1, cannot be installed with Graphic Design (#4485). Note: A fiber optic light pen with a tip switch is available with Graphic Design (#4485) on a mdl 1 and with the basic 2250 mfd. 7.

OPERATOR CONTROL PANEL. FIRST (#5475). [Model 1 only] Provides a duplicate of the on/off and program load facilities (OCP) of a processing unit ... mounted on the 2250 mdl 1. For a remote panel of #5475, it must be installed on a 2050, 2065, 2075, 3165, 3168-3 or 3195. Maximum: One. Specify: #9175 if #5475 is to be installed on a 2085, 3165, 3168, 3168-3 or 3195 equipped with Extended Channels ... see 'Special Features' under those units. Prerequisites: Remote Operator Control Panel Attachment (#9560) on the 2050, 2065, 2085 or 3195 ... see "Specify" under those units.

OPERATOR CONTROL PANEL SECOND (#5476). [Model 1 only] Provides a duplicate of the on/off and program load facilities (OCP) of a second processing unit ... mounted on the 2250 mdl 1. For a remote panel of #5476, it must be installed on a 2250 attached to a 2085, 3165, 3168, 3168-3 or 3195 equipped with Extended Channels ... see 'Special Features' under those units. Prerequisites: #5476 requires Operator Control Panel, 1st (#5875) ... Remote Operator Control Panel Attachment (#9560) on 2050, 2065, 2085 or 3195 ... see "Specify" under those units.

PROGRAMMED FUNCTION KEYBOARD (#5855). [Any model] A 32-key keyboard that allows the operator to indicate program interpretive functions to the system by a single key depression.

Special Feature Prices:  
- MAC/ MRC Purchase: MMMC FIC

On Model 1 or 2  
- Alphanumeric Keyboard: $1245 $51 $3,910 $4.50 $306
- Programmed Fnct Kybd: 5855 162 7,840 9.50 318

On Model 1 only  
- Absolute Vectors & Cntrl: 1002 437 17,410 13.00 388
- Buffer - 4,096: 1498 381 18,290 8.50 179
- Buffer - 6,192: 1499 544 26,110 12.00 179
- Character Generator: 1880 409 19,610 18.50 275
- Graphic Design: 4485 353 16,960 16.00 1,030
- Isolation, Control Unit: 4700 NC NC NC NC
- Operator Control Panel: First: 5475 48 2,170 NC 231
- Second: 5476 37 1,660 NC 115

On Model 1 or 2 only  
- Light Pen: 4785 108 5,220 13.00 161

On Model 2 only  
- Absolute Vectors: 1001 381 15,210 12.00 509

2305 FIXED HEAD STORAGE  
Purpose: High performance direct access storage for a S/360 mfd on 1st or a S/370 mld 145, 145-3, 145, 147, 148, 155, 165, 168, 168, 195, a 3031, 3032 or 3033 Processor, or a 4300 Processor.

Model 1  
Up to 5.4 million bytes can be stored in the 384 addressable tracks ... each track has a maximum data capacity of 14,136 bytes.

Model 2  
Up to 11.2 million bytes can be stored in the 768 addressable tracks ... each track has a maximum data capacity of 14,660 bytes.

Model Changes: Available at time of manufacture only.

Highlights: Features a high data rate and low access time ... designed for applications such as processor storage extension, programming system residence, and table or index storage. Data set organization is under program control, allowing data and key lengths to be variable on an individual record basis. Thus, it provides efficient capacity utilization and record addressing flexibility.

Model 1 -- data is transferred two bits at a time between the 2305 mdl 1 and its 2835 Storage Control mdl 1 ... the 2835 then transfers data to the channel at a rate of 3.0 million 9-bit bytes per second. Any record location on the module can be accessed in an average of 2.5 milliseconds or within a maximum of 5.1 milliseconds.

Model 2 -- data is transferred one bit at a time between the 2305 mdl 2 and its 2835 Storage Control mdl 2 ... the 2835 then transfers data to the channel at a rate of 1.5 million 9-bit bytes per second. Any record location on the module can be accessed in an average of 5.0 milliseconds or within a maximum of 10.2 milliseconds.

Prerequisites: For Model 1 -- up to two 2305 mdl 1s can be attached to a 2835 Storage Control mdl 1 ... For Model 2 -- up to two 2305 mdl 2s can be attached to a 2835 Storage Control mdl 2. Word Buffer (#8810) is required on a 3145.

The 2305 is designed for interconnected operation as part of a 2305/2835 facility. Customers who wish to order a 2305 for stand-alone or individual use should submit an RPQ to provide the necessary safety elements (covers, cable connectors, etc.) to complete the unit for a non-standard (i.e., not interconnected with a 2385) environment. In lieu of the RPQ, the customer may provide safety elements equivalent to the standard 2305/2835 configuration or that provided by the above RPQ. If not provided the unit will be offered on a purchase only basis. See item [2] under "Specify." Agreement for IBM to install and maintain the 2305 in any non-standard environment must be reviewed

Limitation: The 2305 mdl 1 cannot be attached to a S/370 mdl 145, 145-3, 148, 155, 158, 165, 168-3 or 3195 equipped with Graphic Design 4485.

Specify: Voltage (AC, 3-phase, 60 Hz): #9903 for 208 V., or #9905 for 230 V.

[2] Non-standard Environment: #9485 ... must be specified if the 2305 is not to be installed as part of a 2305/2835 combination. When ordering #9485, do not specify item [3] or [4] below.

[3] Initial Machine Order: If only one 2305 is being ordered, specify #9430 ... if two 2305s are being ordered for concurrent installation, specify #9431 for first one and #9432 for second one (separate orders are required) ... if one 2305 is on order and a second one is desired for concurrent installation, Altera- tional IAC is required for on-order 2305 (delete #9430 and add #9431) and order for second 2305 must specify #9432. For field installation of second module, see item [4] below.

[4] (a) If the 2305 is being ordered for shipment from the plant of control, specify #9433 and deleting #9430 against the serial number of the existing (first) 2305 on the customer’s facility ... refer to 2835 for additional instructions.

(b) To field convert a 2305 from the first position to the second position, order RPQ and submit per (a) above, to change position of the existing (first) 2305 on the customer’s facility ... refer to 2835 for additional instructions.

PRICES:  
- FTP – /  

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<th>MAC/ MRC</th>
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Plan Offering: Plan A, Additional Use Charge Rate: 10%  
Metering: Assignable Unit
Maintenance: A Post Call 3 Purchase Option: 45%
Useful Life Category: 1 Upper Limit Percent: 0%  
Termination Chg Mths: 5 Termination Chg Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 10%
**Purpose:** Large capacity high speed direct access storage and control for a S/360 mdl 30, 40, 50, 65, 75, 85, 195, or any S/370 Processor except 3115 or 3125.

**Highlights:** Has eight independent modules, each storing up to 29,17 million 8-bit bytes or 58,35 million packed decimal digits in a 2316 Disk Pack.

The eight removable and interchangeable 2316s provide a total of 233.4 million bytes of online storage and virtually unlimited offline storage. Minimum access is 25 milliseconds; average is 75 milliseconds; maximum is 135 milliseconds. Standard features include: File Scan -- for comparing a tape file to a disk file, Record Overwrite -- for greater utilization of storage, Enhanced system reliability and performance is achieved by provision of a ninth "spare" module for customer use should one of the eight normally addressed modules become inoperable.

**Cylinder Concept:** The 2314 has 20 tracks. Up to 7,294 bytes (or 14,588 packed decimal digits) per track, provide 145,860 bytes (or 291,760 packed decimal digits) per cylinder, available under each of the eight access mechanisms.

Data transmission is at a rate of 312,000 bytes/second ... with packed decimal, the rate is 624,000 bytes/second.

**An advanced method of utilizing disk storage.**

Self-formatting tracks allow variable length identifiers and records to be easily handled. Command chaining -- multiple records within a cylinder can be read/written by a sequence of channel commands without rotational delays between records ... permits index and directory searches without processor intervention. Command structure is optimized to yield efficient random or sequential processing with either randomly or sequentially organized data files. The ability to protect 'logical' files is provided by the combination of commands in the 2314 and checks within the control programs servicing the file system. Cyclic code and bit count checking is used to assure the integrity of stored data. The controls necessary to attach the unit to a system channel are included in the 2314.

**Prerequisites:** A control unit position on a system channel. S/360 mdl 30, 40, 50, 67 -- a special feature, Selector Channel ... see 2030, 2040, 2050.

S/360 mdl 65, 75 -- a selector channel of 2860 ... see 2860.

S/360 mdl 85, 195 or S/370 mdl 165, 168, 195 -- a selector channel of 2860, or a shared subchannel of a 2880 ... see 2860, 2880.

S/370 mdl 135 -- Selector Channel (special feature) ... see 3135.

S/370 mdl 135-3 -- Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mdl 138 -- block multiplexer channels (standard) ... see 3138.

S/370 mdl 145 -- selector channel (standard) ... see 3145.

S/370 mdl 145-3 -- block multiplexer channels ... see 3145-3.

S/370 mdl 148 -- block multiplexer channels (standard) ... see 3148.

S/370 mdl 155, 158 -- block multiplexer channel ... see 3155, 3158.

3031 or 3032 Processor -- block multiplexer channels ... see 3031 or 3032.

3033 Processor -- block multiplexer channels (ten are standard) ... see 3033.

Each disk storage module requires a 2316 Disk Pack ... these must be ordered separately.

**Limitations:**

S/360 mdl 30 -- the 2314 requires a 1.5-microsecond 2030 and can be attached only to the first selector channel. Further, when the 3114 is attached, the second selector channel is restricted as to devices that may be attached ... see “Channel Control Capabilities” under 2030. When a 2841 Control Unit and a 2314 are both attached to a 2030, both must be attached to the first selector channel. Because of the high data rate of the 2314 and the cycle stealing concept of the selector channel, available program processing time is reduced during 2314 operations. This is of particular concern when handling time dependent I/O devices, i.e., 1412, 1415, 1419, 1428. To determine the 2314 loading on each cylinder, see 3100 Model 30 Channel Characteristics and Functional Evaluations.”

S/360 mdl 40 -- the 2314 may be attached to either the first or second selector channel. However, 2314s may not be attached to both selector channels.

S/360 mdl 50 -- if the 2314 is to be used with a 2050 having 1410/7010 Compatibility ("#478"), consult

**Bibliography:** S/360 -- GC20-0360 S/370 -- GC20-0001

**Specify:** [1] Each 2314 DASF mdl 1 is to be specified on AAS as follows: a) One 2314 mdl 001, b) One 2312 mdl 001, and c) Two 2313 mdl 001s -- on one of the 2313s also specify 9140 (to indicate the 2313 at the end of the 2314 DASF).

**Note:** The 2312 and 2313 type numbers and their associated feature codes are to be specified at no charge and are to be used only for internal IBM ordering and control purposes. List each type and model (2312, 2312, 2313) separately with all its associated feature codes. The 2312 and 2313 type numbers should never appear on any agreement.

[2] Voltage (AC, 3-phase, 60 Hz): Specify the same code for the 2314, the 2312 and each 2313 ... #9903 for 208 V, or #9905 for 230 V.

[3] Color: For 2314 only ... #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[4] Additional Codes: On the 2312 and 2313 additional codes are required depending upon special features on the 2314 and 2844 Auxiliary Storage Control ... see "Special Features" below.

**2316 Disk Packs:** 2316s are required and must be ordered separately ... see 2316.

**6. Isolation Feature:** May be required on units shipped prior to December 29, 1967 ... see "Special Features."
**DP Machines**

**2314 Direct Access Storage Facility - Mdl 1** (cont'd)

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**2315 DISK CARTRIDGE**

*Purpose:* High-speed removable disk storage unit for a drive in an 1810 or 2310 Disk Storage, the drive in an 1131 Central Processing Unit mdl 2, 3 or 4 or the standard single disk storage drive or Second Single Disk Storage Drive (#6415) of a 2044 Processing Unit.

The 2315 is marketed by IRD ...

---

**2316 DISK PACK**

*Purpose:* High-speed, removable, interchangeable disk storage unit for the 2314 DASF, the 2319 Disk Storage, or the 5445 Disk Storage Drive.

The 2316 is marketed by IRD

---

* FTP is 12-23 months.
Purpose: Magnetic tape unit for S/360 models 22 thru 85 and 195, any S/370 Processor (except 3115 or 3125), any 4300 Processor, or an 1800 system.

For use with a 360 mdl 20, see GSD Manual.

Models: Operate at the following 8-bit bytes per second data rates:

- **Model 1**: 30,000 at 800 bpi
- **Model 2**: 50,000 at 800 bpi
- **Model 3**: 90,000 at 800 bpi
- **Model 4**: 60,000 at 1600 bpi
- **Model 5**: 120,000 at 1600 bpi
- **Model 6**: 180,000 at 1600 bpi
- **Model 8**: Operates only in the seven-track format at 200, 556, or 800 bpi with data rates of 15, 41.7, or 60 KB.

Model Changes: Model 2 can be field changed to model 3 ... model 5 to model 6 ... no other changes are possible.

Systems:

- **S/360 models 22, 30 thru 85 and 195, any S/370 Processor** (except 3115 or 3125), or any 4300 Processor -- all models can be attached except model 6 on the S/360 mdl 22 ... in a S/360 mdl 44, mdl 6s cannot be attached to the Multiplexer Channel (#5248).

1800 -- only mdls 1, 2 and 3 can be attached.

Highlights: Single tape unit which reads or writes the following half-inch magnetic tapes: IBM Heavy Duty, IBM Dynexcel, IBM Super 500, or competitive formulates which meet the specifications described in SRL GA32-0006. IBM Mylar is suitable for use at 200, 556 or 800 bpi, but it should not be used at 1600 bpi.

On models 1, 2 and 3, a 9-Track Read/Write Head (#9558) or a 7-Track Read/Write Head (#9567) may be specified. See "Specify" below. On models 4, 5 and 6, use of Dual Density 800-1600 BPI (#3471) permits operation at 800 bpi density as well as at 1600 bpi. See "Special Features."

Nine Track Operation -- in 9-track format, data is recorded parallel by bit, serial by byte, in 9 tracks across the width of the tape ... tape data format uses eight of the nine bits for data, the ninth bit serving as a parity bit. The eight data bits can represent an alphanumeric or special character, two digits, a signed digit, or eight binary bits. For this operation on a mdl 1, 2 or 3, #9558 is required ... see "Specify" below.

Seven Track Operation -- on mdls 1, 2, 3 or 8 only ... tape is written in a 7-track format compatible with tape written by 727/729/7330/7353/7701/7702/7765 tape units and by 2401/2415s (or 2402s), or 3420s equipped with 7-track Read/Write Heads. For this operation, #9557 is required, except on 2401 mdl 8. See "Specify." Seven Track compatibility (#7125, 7126, 7127) or Seven and Nine Track (800 BPI NRZI Compatibility; #7135, 7136) is also required on the 2803/2804 (or 2403/2404) tape control unit, except on 2803/2804 mdls 3s. See "Special Features" under those units.

Checking -- read-back-check-while-write on all models ... vertical parity recording on models 4, 5 and 6 ... vertical, longitudinal and diagonal parity recording on models 1, 2, 3 and 8.

Error Correction -- automatic in-flight single track error correction is provided for 1600 bpi 9-track format ... automatic single track error correction for 800 bpi 9-track format during the reed of a record containing one or more errors confined to a single track ... all other errors are detected and conventional error recovery routines apply.

Read Backwards -- all tapes (9 or 7-track) written on a 2401/2402/2403/2404/2415/2420 (9-track 1600 BPI PE only)/3420 can be read by any 2401/2402/2403/2404/2415/2420 (9-track 1600 B I P E only)/3420 in a forward or backwards direction. Data conversion (#2299,3236) cannot be used on the tape control unit when reading 7-track tape backwards ... tape written by 727/729/7330/7353/7701/7702/7765 cannot be read backwards.

Power Window -- on machines shipped after April 1,1966, a powered access window, raised or lowered under push-button control and always lowered upon completion of the program-initiated rewind unload command, is standard ... for units shipped prior to April 1, 1966, see Power Window (#5519) under "Special Features."

Quick Release Latch -- facilitates mounting and removal of tape reels.

**Characteristics:**

- **800 BPI**:
  - **Mdl 1**: 30,000
  - **Mdl 2**: 50,000
  - **Mdl 3**: 90,000
- **Density (bytes/inch)**:
  - 800
  - 800
  - 800
- **Tape Speed (inches/sec)**:
  - 37.5
  - 75.0
  - 112.5
- **Nominal Interrecord Gap**:
  - 6
  - 6
  - 6
- **Nominal IRG (milliseconds)**:
  - 16.0
  - 8.0
  - 5.3
- **Rewind Time (inclg reload)**:
  - 3.0
  - 1.4
  - 1.0
- **Rewind & Unload (minutes)**:
  - 2.2
  - 1.5
  - 1.1

**Prerequisites:**

For S/360, S/370 or 4300 Processors:

- **2401 models 1, 2, 3** -- a 2803 or 2804 Tape Control mdl 1 or 2 (or 2404 mdl 1, 2, 3, 5, 6, or 2404 mdl 1, 2 or 3) ... with a 2803 or 2804 mdl 2 (or 2403 mdl 4, 5, 6, 7, 8). Mode Compatibility (#9512) is required on each 2401 ... with a 2809 (or 2404), Simultaneous Read-write-write (#7160) is also required on each 2401. See "Special Features." below.

- **2401 mdls 4, 5 or 6** -- a 2803 or 2804 Tape Control mdl 2 (or 2403 mdl 4, 5 or 6) ... with a 2804. Simultaneous Read-write-write (#7160) is also required. See Special Features below.

2401 mdls 8 -- a 2803 or 2804 Tape Control mdl 3 ... with a 2804 mdl 3, each tape unit attached must be equipped with Simultaneous Read-write-write (#7160).

The 2803 (or 2403) requires a control unit position on a system channel ... the 2804 (or 2404) requires one control unit position on each of two system channels. For applicable channels, see 2803/2804.

For 1800:

- #3222 is required on the 1802 for one or two 2401 mdls 1, 2 or 3 (or one 2402 mdl 1, 2 or 3). See 1802.

**Maximums:**

- **S/360, S/370 or 4300 Processors** -- any combination of 2401 (or 2402) mdls 1, 2 and 3 which does not exceed 8 tape drives can be attached to a 2803/2804 ... any combination of 2401 (or 2402) mdls 1, 2 or 3 which does not exceed seven tape drives can be attached to a 2803/2804 mdl 2 ... any combination of 2401 (or 2402) mdls 1, 2, 3, 4, 5 or 6 which does not exceed seven tape drives can be attached to a 2803/2804 mdl 3.

IBM DP Machines

2401 MAGNETIC TAPE UNIT

---

Prereq's:

1. [M/401] May 79

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### 2401 Magnetic Tape Unit

**I/O Unit (Online)**

---

Tape reels: If any color other than gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.

---

Use with 2804 (or 2404): Simultaneous-Read-while-Write (#7160) is required on each 2401 ... see "Special Features" below.

---

Use with 2803/2804 mdl 2 (or 2403 mdl 4, 5 or 6): Mode Compatibility (#5121) is required on each 2401 mdl 1, 2 or 3 ... see "Special Features" below.

---

**PRICES:**

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<th>MLC</th>
<th>1 Yr</th>
<th>2 Yr</th>
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**Plan Offering:** Plan A, Additional Use Charge Rate: 10% Maintenance: C Per Call: 3 Warranty: B Purchase Option: 45% Metering: I/O Unit

**Termination Charge Months:** 5 Termination Charge Percent: 25% Model/Feature Additional Charge in lieu of AU Charge: 10%

**Upper Limit Percent:** 0%

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**SPECIAL FEATURES**

**DUAL DENSITY - 1600 BPI (#3471).** [2401 mdl 4, 5, 6 only] Permits these drives to operate at 800 bpi in addition to 1600 bpi. **Prerequisite:** Nine Track (800 BPI NRZI) Compatibility (#5320, 5321) or Seven and Nine Track Compatibility (#7135, 7136) on the 2803/2804 mdl 2 (or 2403 mdl 4, 5, 6) controlling the 2401.

**MODE COMPATIBILITY (#5121).** [2401 mdl 1, 2, 3 only] Required to attach these units to a 2803/2804 mdl 2 (or 2403 mdl 4, 5 or 6).

**POWER WINDOW (#5519).** [For field installation on units shipped before April 1, 1966 ... all units shipped after April 1, 1966 are equipped with a power window as standard]. This feature may be ordered for field installation on units installed without the feature. **Specify:** Serial number of 2401.

**SIMULTANEOUS READ-WHILE-WRITE (#7160).** Required on any 2401 attached to a two-channel, simultaneous read-while-write tape control. 2401 mdls 1, 2, 3 or 8 require this feature when attached to a 2804 Tape Control mdl 1, 2 or 3 (or 2404 mdl 1, 2 or 3). 2401 mdls 4, 5 or 6 require it when attached to a 2804 mdl 2. **Limitation:** When equipped with this feature, 2401s will not operate with a 2803 (or 2804) control unit.

---

**COLORS**

- #9041 for red
- #9042 for yellow
- #9043 for blue
- #9044 for gray

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**Tape Reels:** If any color other than gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.

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Use with 2804 (or 2404): On 2402s, Simultaneous-Read-while-Write (#7161) is required ... see "Special Features."

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**Isolation, Control Unit:** May be required on 2403s or 2404s shipped prior to December 29, 1967 ... see "Special Features."

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**2402 MAGNETIC TAPE UNIT**

**2403 MAGNETIC TAPE UNIT AND CONTROL**

**2404 MAGNETIC TAPE UNIT AND CONTROL**

Note: These units have been withdrawn and new orders cannot be accepted ... the special features listed below are available for field installation.

**2402** -- two independently operating drives in a single unit.

**2403** -- a single channel, read or write tape control and one tape drive.

**2404** -- a two channel, simultaneous read-write tape control and one tape drive.

**Models:**

- **Model 1** 30,000 at 800 bpi **Model 4** 60,000 at 1600 bpi
- **Model 2** 60,000 at 800 bpi **Model 5** 120,000 at 1600 bpi
- **Model 3** 90,000 at 800 bpi **Model 6** 180,000 at 1600 bpi

**Model Changes:**

- **2402** -- a model 2 can be field converted to a model 3, or a model 5 to a model 6 ... **2404** -- a model 2 can be field converted to a model 3 ... no other changes are possible.

**Limitations:** In 1968 -- only a 2402 mdl 1, 2 or 3 can be used.

**In 9/360 mdl 44 -- a 2402 mdl 6 or 2403 mdl 6 cannot be attached to a Multiplexer Channel (#5248).**

**Highlights:** See "Highlights" under 2401.

**Prerequisites:** See "Prerequisites" under 2401.

**Maximums:** See "Maximums" under 2401.

**Specify:** [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

**Call:** [2] Read/Write Heads: [For mdls 1, 2 or 3 only (800 bpi NRZI)] #5347 for 7-track, or #5558 for 9-track. **Prerequisite:** For #9557. Seven Track Compatibility or Seven and Nine Track Compatibility feature on the tape control ... see "Special Features" below or under 1962 or 2403 or 2404. **Note:** #9557 can be changed in the field to #9558, or vice versa, by MES for the rental customer. On purchased machines, the changes can be made on an RPQ basis ... when ordering, specify #9557 or #9558, machine type and model.

**Color:** #9041 for red, #9042 for yellow, #9043 for blue, or #9044 for gray.

---

**Plan Offering:** Plan A, Additional Use Charge Rate: 10% Maintenance: C Per Call: 3 Warranty: B Purchase Option: 45% Metering: I/O Unit

**Termination Charge Months:** 5 Termination Charge Percent: 25% Model/Feature Additional Charge in lieu of AU Charge: 10%

**Upper Limit Percent:** 0%
SPECIAL FEATURES

The following features are on an "as available" basis for field installation.

DATA CONVERSION (#3228, 3236). Program controlled feature for processing data with maximum packing efficiency. On a write operation, three 8-bit bytes are written as four 6-bit tape characters, on a read operation, four 6-bit tape characters are converted to three 8-bit bytes. #3228 -- on 2403 ... #3236 -- on 2404. Limitation: Cannot be used when reading 7-track tapes backward. Prerequisite: Seven Track Compatibility (#7125, 7126, 7127) and Seven and Nine Track (800 BPI NRZI Compatibility (#7135).

DUAL DENSITY 800-1600 BPI (#3471, 3472). [2402/2403 mdl 4, 5, 6 only] Permits these drives to operate at 800 bpi as well as 1600 bpi. #3471 -- for 2403 mdl 4, 5, 6 ... #3472 -- for 2402 mdl 4, 5 or 6. Prerequisite: For 2402 -- Nine Track (800 BPI NRZI) Compatibility (#5320, 5321) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135). On the controlling 2403 mdl 4, 5 or 6 or 2803/2804 mdl 2 ... for 2403 -- #5320 or #7135 on the 2403 itself.

ISOLATION, CONTROL UNIT (#4701-4704). [2403 or 2404 only ... for field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the tape control without generating spurious signals. Thus a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. #4701 -- for basic 2403 mdl 1, 2 or 3. #4702 -- for a 2403 mdl 1, 2 or 3 with Two Channel Switch (#8100). #4703 -- for a 2403 mdl 4, 5 or 6. #4704 -- for a 2404 mdl 1, 2 or 3. Prerequisites: in all cases there are compatible EC level requirements and technical limitations.

#4702 requires Two Channel Switch (#8100) on the 2403 mdl 1, 2 or 3.

MODE COMPATIBILITY (#5122). [2402 mdl 1, 2 or 3 only] Required to acquire the 2402 mdl 1, 2 or 3 to a 2403 mdl 4, 5 or 6 or a 2404/2402/2403 mdl 2.

NINE TRACK (800 BPI NRZI) COMPATIBILITY (#5320). [2403 mdl 4, 5 or 6 only] Required if any drive of an attached 2401/2402 mdl 1, 2 or 3 has a 9-track Read/Write Head (with #1000) to a 2167 Configuration Control or route it thru the Configuration Control Panel (#1505) of a multiprocessor S/360 mdl 65 system. Prerequisites: Two Channel Switch (#8100) and a 2167 or the #1505 of a multiprocessor S/360 mdl 65.

SEVEN TRACK COMPATIBILITY (#7125 - 7127). Required if any 2401 or 2402 mdl 1, 2 or 3 attached to the 2403 or 2404 has a 7-track Read/Write Head (#9557). Permits such drives to read or write in 7-track format compatible with tape generated by 727/729/7330/7335/7701/7702/7765 tape units and other 2401/2402/2403/2404 or 2415 tape drives equipped with 7-track Heads. #7125 -- for 2403 mdl 1, 2 or 3 ... #7126 -- for 2404 mdl 1, 2 or 3 ... #7127 -- for 2403 mdl 4, 5 or 6. Limitation: Cannot be installed with Nine Track (800 BPI NRZI) Compatibility (#5320) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135) on a 2403 mdl 4, 5 or 6. Specify: The number of tape drives associated with this feature that will be equipped with 7-track Read/Write Heads (#9557).

SEVEN AND NINE TRACK (800 BPI NRZI) COMPATIBILITY (#7135). [2403 mdl 4, 5 or 6 only] Satisfies the requirements of both the Seven Track Compatibility (#7127) and Nine Track (800 BPI NRZI) Compatibility (#5320) features ... permits reading and writing of both 7-track and 9-track 800 bpi NRZI tapes on suitably equipped tape drives attached to the 2403 mdl 4, 5 or 6. Limitation: Cannot be installed with Nine Track (800 BPI NRZI) Compatibility (#5320) or Seven Track Compatibility (#7127). Specify: The number of tape drives associated with this feature that will be equipped with 7-track Read/Write Heads (#9557).

Prerequisites: 7-track Read/Write Head(s) on 2401/2402 mdls 1, 2 or 3 attached to this 2403 and/or Dual Density (#3471, 3472) on the 2403 or attached 2402(s).

SIMULTANEOUS READ-WHILE-WRITE (#7161). [2402 mdl 1, 2, 3, 4, 5, 6 only] Required on any 2402 attached to a two channel, simultaneous read-write tape control ... 2402 mdls 1, 2 or 3 require this feature when attached to a 2404 mdl 1, 2 or 3 or a 2804 mdl 1 or 2 ... 2402 mdls 4, 5 or 6 require it when attached to a 2404 mdl 2. Limitation: When equipped with this feature, 2402s will not operate with a 2403 or 2803 control unit.

SIXTEEN DRIVE ADDRESSING (#7185). [2403 mdl 1, 2, 3, 4, 5, 6 only] Required where the pool of drives attached through 2318 Switching Units exceeds eight ... permits the 2403 to address up to sixteen tape drives ... see 2816.

TWO CHANNEL SWITCH (#8100). [2403 mdl 1, 2, 3 only ... for use in a S/360 mdl 67 or multiprocessor S/360 mdl 65 only] To attach the 2403 to a second channel ... switching is under program control ... includes partitioning.

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Purpose: Magnetic tape unit and control for a S/360 mdl 22, 25, 30, 40, 50, 65, 67 or 75... or a S/370 mdl 135, 135-3, 138, 145, 145-3, 146, 155, 158, or a 3031 Processor, or any 4300 Processor.

Note: For use with S/360 mdl 20, see GSD manual.

Models: Each model has one single-channel tape control and multiple independently operating tape drives.

15,000 bytes/sec. (800 bpi) 30,000 bytes/sec. (1600 bpi)*

- Model 1 - 2 drives
- Model 2 - 4 drives
- Model 3 - 6 drives
- Model 6 - 6 drives

* When equipped with an appropriate compatibility feature, drives on these models can operate at 15,000 bytes/second (800 bpi) ... see "Special Features."

Model Changes: A model 1, 2 or 3 can be field converted to another model within that group. ... a model 4, 5 or 6 to another model in that group. ... no other changes are possible. See item [1] under "Specify."

Highlights: Tape drives read and write the following half-inch magnetic tapes: IBM Heavy Duty, IBM Dynecell, IBM Series 500, or competitive formulations which meet the specifications described in SRL GA32-0006. IBM Mylar** is suitable for use at 200, 556 or 800 bpi, but should not be used at 1600 bpi.

The standard drives read or write 9-track tapes. Special features permit reading and writing of 7-track tapes ... see "Special Features."

Nine Track Operation -- in 9-track format, data is recorded parallel by bit, serial by byte, in 9 tracks across the width of the tape ... tape data format uses 8 of the 9 bits for data, the 9th bit serving as a parity bit. The 8 data digits can represent an alphanumeric or special character, two digits, a signed digit, or 8 binary bits.

Seven Track Operation -- tape is written in 7-track format compatible with tape written by 727/729/7330/7335/7701/7702/7765 tape units and by 2415/2415 or 2402/2403/2404 and 3420s equipped with 7-track Read/Write Heads. For this operation, a compatibility feature #7125, #7127 or #7135 is required ... see "Special Features."

Checking: Read-back-check-while-write on all drives vertical, longitudinal and diagonal parity recording on 800 bpi drives.

Error Correction: Automatic in-flight single track error correction is provided for 1600 bpi 9-track format ... all other errors are detected and conventional error recovery routines apply. The cyclic redundancy check character is recorded on 800 bpi 9-track format to maintain 2400 series compatibility ... drives are not capable of error correction during read operations ... all errors are detected and conventional error recovery routines apply.

Read Backward: All tapes (9 or 7 track) written on a 2401/2402/2403/2404/2415/2420 (9-track 1600 BPI PE only) or 3420 can be read by any 2401/2402/2403/2404/2415/2420 (9-track 1600 BPI PE only) or 3420 in a forward or backward direction ... Data Conversion (#3228) cannot be used when reading 7-track tape backwards ... tapes written by 727/729/7330/7701/7702/7765 cannot be read backward.

Quick Release Latches: Each drive has quick release latches to facilitate mounting and removing of tape reels.

Characteristics:

<table>
<thead>
<tr>
<th>Mdl 1, 2, 3</th>
<th>Mdl 4, 5, 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bytes/second</td>
<td>15,000</td>
</tr>
<tr>
<td>Density (bytes/inch)</td>
<td>800</td>
</tr>
<tr>
<td>Tape Speed (inches/second)</td>
<td>18.75</td>
</tr>
<tr>
<td>Nominal Intertrack Gap (inches)</td>
<td>.6</td>
</tr>
<tr>
<td>Nominal IRG Time (milliseconds)</td>
<td>32.00</td>
</tr>
<tr>
<td>Rewind Time, including reload (minutes)</td>
<td>4.0</td>
</tr>
<tr>
<td>Rewind and Unload (minutes)</td>
<td>4.0</td>
</tr>
</tbody>
</table>

Prerequisites:

For S/360 mdl 25 -- a control unit position on the Selector Channel (#6960) on the 2025 ... see 2025.

For S/360 mdl 22, 23, 30, 40, 50 -- a control unit position on a multiplexer channel (standard), or Selector Channel (special feature, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.

For S/360 mdl 65, 67, 75 -- a control unit position on a selector channel of a 2660, or Selector Subchannel (special feature) on a 2870 ... see 2860, 2870.

For S/370 mdl 135 -- multiplexer channel (standard), selector channel (special feature, or block multiplexer channel (special feature) ... see 3135. Not supported on byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or a Selector Channel.

For S/370 mdl 135-3 -- byte multiplexer channel (standard), block multiplexer channels (special features) ... see 3135-3. Not supported by byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or block multiplexer channel.

For S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (special feature) ... see 3135. Not supported by byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or block multiplexer channel.

For S/370 mdl 145 -- multiplexer channel (standard), or selector channels ... see 3145.

For S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

For S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145.

For S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.

3031 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031.

4331 Processor -- byte multiplexer channel (optional) ... see 4331 byte multiplexer channel for restrictions ... block multiplexer channel (optional) ... see 4331.

4341 Processor -- block multiplexer channels (two are standard) ... see 4341.


SPECIFY: [1] All 2415 models are to be ordered as follows:

<table>
<thead>
<tr>
<th>2415 Model</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>(AC, 3-phase, 4-wire, 60 Hz): For 2415 only -- #9903</td>
<td>220 V, or #9905 for 230 V.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| Read/Write Heads: A 9-track head is furnished as standard for each of the two drives in each 2415 unless Seven Track Compatibility (#7125, #7127) or Seven and Nine Track Compatibility (#7135) is ordered for the 2415 and 7-Track Read/Write Heads are specified as indicated under those features ... see "Special Features."
| Color: For 2415 listed in [1] above, specify one of the following -- #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. The same color must be specified for all units comprising the 2415.

[2] Empty Tape Reels: If other than the standard gray reels are desired, for 2415 listed in [1] above, specify two of the following in any combination -- #9051 for red, #9053 for blue, or #9054 for white.

[8] Isolation, Control Unit: May be required on units shipped prior to December 29, 1967 ... see "Special Features."
2415 Magnetic Tape Unit and Control (cont’d)

PRICES:  

<table>
<thead>
<tr>
<th>Mdl</th>
<th>PR</th>
<th>MAC</th>
<th>MLC</th>
<th>Purchase</th>
<th>MMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>2415</td>
<td>1</td>
<td>$584</td>
<td>$774</td>
<td>$706</td>
<td>$32,950</td>
</tr>
<tr>
<td>2415</td>
<td>2</td>
<td>1,345</td>
<td>1,237</td>
<td>1,139</td>
<td>52,690</td>
</tr>
<tr>
<td>2415</td>
<td>3</td>
<td>1,845</td>
<td>1,687</td>
<td>1,550</td>
<td>72,420</td>
</tr>
<tr>
<td>2415</td>
<td>4</td>
<td>1,015</td>
<td>534</td>
<td>853</td>
<td>40,010</td>
</tr>
<tr>
<td>2415</td>
<td>5</td>
<td>1,630</td>
<td>1,500</td>
<td>1,369</td>
<td>64,260</td>
</tr>
<tr>
<td>2415</td>
<td>6</td>
<td>2,240</td>
<td>2,061</td>
<td>1,882</td>
<td>88,510</td>
</tr>
</tbody>
</table>

Plan Offering: Plan A, Additional Use Charge Rate: 10%  
Maintenance: C  
Warranty: B  
Metering: Assignable Unit  
Purchase Option: 45%  
Termination Charge Months: 5  
Termination Charge Percent: 25%  
Upper Limit Percent: 0%  

SPECIAL FEATURES

DATA CONVERSION (#3228). Program-controlled feature for processing data with maximum packing efficiency. On a write operation, three 8-bit bytes are written as four 6-bit tape characters... on a read operation, four 6-bit tape characters are converted to three 8-bit bytes. **Limitation:** Cannot be used when reading 7-track tapes backwards. **Note:** Specify on 2415  

Prerequisite: Seven Track Compatibility (#7125 or #7127) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135).  

ISOLATION, CONTROL UNIT (#4701, #4703). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2415 without generating spurious signals. Thus, a CPU program, if it is logically acceptable, may turn power off. For a rental customer, the charge will be made on an RPQ basis.  

SEVEN TRACK COMPATIBILITY (#7125, 7127). Required if any of the 2415 drives is to read or write 800 bpi 9-track NRZI in addition to 800 bpi. **Limitation:** Cannot be installed with Seven Track Compatibility (#7127) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135). **Note:** Specify on 2415  

SEVEN AND NINE TRACK (800 BPI NRZI) COMPATIBILITY (#5320). [Models 4, 5, 6 only] Required if any of the drives is to read or write 800 bpi 9-track NRZI compatibility in addition to 800 bpi. **Limitation:** Cannot be installed with All Track Compatibility (#7127) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135). **Note:** Specify on 2415  

SEVEN TRACK COMPATIBILITY (#7125, 7127). Required if any of the 2415 drives is to read or write 7-track tape. **Note:** Each 2415 and 2416 has two drives. Permits them to read or write tape in 7-track format compatible with tape generated by 727/7279/7330/7336/7351/7072/7665 tape drives and by 2401/2402/2403/2404/2415/3420 tape drives with 7-track Read/Write Heads. **Special Feature Prices:** MRC 1 Yr or 2 Yr Purchase MMRM  

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>7-track Read/Write Heads</th>
<th>Left Drive (A)</th>
<th>Right Drive (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2415</td>
<td>1 or 4</td>
<td>#9680</td>
<td>#9681</td>
<td></td>
</tr>
<tr>
<td>2415</td>
<td>2 or 5</td>
<td>#9680</td>
<td>#9681</td>
<td></td>
</tr>
<tr>
<td>2415</td>
<td>3 or 6</td>
<td>#9680</td>
<td>#9681</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** For any drive where a 7-track head is not specified, a 9-track head will be furnished.  

In the field, a 7-track head can be replaced by a 9-track head, and vice versa, by MES for a rental customer. On purchased machines, the charge will be made on an RPQ basis. Must show specific 9XXX feature numbers (from above list) to designate which 7-track head is to be removed and which is to be installed. A typical example of such a change is described under Seven Track Compatibility (#7125, 7127) above.

Removal of #9680 and #9683 in effect causes these drive positions to revert to standard 9-track heads and installation of #9681 and #9682 changes these other positions to 7-track heads. Parts and instructions supplied will enable all drives to function in the desired manner when installed.

SEVEN AND NINE TRACK (800 BPI NRZI) COMPATIBILITY (#7135). [Models 4, 5, 6 only] Satisfies the requirements of both Nine Track (800 BPI NRZI) Compatibility (#5320) and Seven Track Compatibility (#7127). Permits reading and writing of both Seven Track and Nine Track (#5320) or Seven and Nine Track (800 BPI NRZI) Compatibility (#7135). **Limitation:** Cannot be installed with #5320 or #7127. Specify: #7135 for 2415 only ... do not specify on 2416(a) since only the unit containing control circuits is affected. Either or both drives in the 2415 may be equipped with a 7-track Read/Write Head. From the following table order only for the specific position(s) on each unit which is to read/write 7-track tape:

<table>
<thead>
<tr>
<th>Type</th>
<th>Model</th>
<th>7-track Read/Write Heads</th>
<th>Left Drive (A)</th>
<th>Right Drive (B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2415</td>
<td>4</td>
<td>#9680</td>
<td>#9681</td>
<td></td>
</tr>
<tr>
<td>2415</td>
<td>5</td>
<td>#9680</td>
<td>#9681</td>
<td></td>
</tr>
<tr>
<td>2415</td>
<td>6</td>
<td>#9680</td>
<td>#9681</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** For any drive where a 7-track head is not specified, a 9-track head will be furnished. In the field, a 7-track head can be replaced by a 9-track head, and vice versa, by MES for a rental customer. On purchased machines, the charge will be made on an RPQ basis. Must show specific 9XXX feature numbers (from above list) to designate which 7-track head is to be removed and which is to be installed. A typical example of such a change is described under Seven Track Compatibility (#7125, 7127) above.

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2420 MAGNETIC TAPE UNIT

Purpose: Magnetic tape unit for use with S/360, S/370 or 4300 Processors.

Model 5
160,000 bytes/second. For use with S/360 mdls 30, 40, 44, 50, 65, 67, 85, 91, 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor.

Model 7
320,000 bytes/second. For use with S/360 mdls 50, 65, 67, 75, 85, 91, 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor.

Model Changes: Cannot be made in the field.

Specifications:
- **Purpose:** Magnetic tape unit for use with S/360, S/370 or 4300 Processors.
- **Model Changes:** Cannot be made in the field.
- **Features:** Automatic threading, automatic inflight single track error correction, power window, quick release hatch.
- **Characteristics:**
  - **Model 1:**
    - Bytes/second: 160,000
    - Density (bytes/inch): 1,600
    - Tape Speed (inches/second): 100
    - Nominal Interblock Gap (inches): 0.6
    - Nominal IBG/IRG Time (milliseconds): 3.0
    - Rewind Time (minutes): 1.2
    - Rewind and Unload (minutes): 1.3
    - Read/Write Access Time (milliseconds): 2.5
  - **Model 2:**
    - Bytes/second: 320,000
    - Density (bytes/inch): 1,600
    - Tape Speed (inches/second): 200
    - Nominal Interblock Gap (inches): 0.6
    - Nominal IBG/IRG Time (milliseconds): 3.0
    - Rewind Time (minutes): 1.2
    - Rewind and Unload (minutes): 1.3
    - Read/Write Access Time (milliseconds): 2.5

- **Special Features:** Tape reels must be attached to a selector channel, or on a S/360 mdl 85, 195 and S/370 mdl 165, 195 to a shared sub-channel of a 2880. On a S/370 mdl 155, 158 or 3031, 3032 or 3033 Processor only a block multiplexer channel can be used. On a S/370 mdl 135, only a Selector Channel (special feature) may be used. On a S/370 mdl 135-3 or 136 only a block multiplexer channel may be used. 2420 mtl 7s must be attached to the block multiplexer channel on 4331 (special feature) or 4341 Processors.

- **Supplies:**
  - All standard 10-1/2" reel of magnetic tape enclosed in an Easyload Cartridge is supplied with the unit.
  - **Bibliography:**
  - **Specifications:**
    - Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 208 V.
  - **Color:**
    - #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
  - **Tape Reels:**
    - If any color other than gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.

- **FTP**
- **Prices:**
  - Model 5: S/360 $634, S/370 $583, S/370 $533, $27,080, $181
  - Model 7: 7, 1,140, 1,049, 958, 50,590, 198

- **Plan Offering:**
  - Plan A, Additional Use Charge Rate: 10%
  - Maintenance: C Per Call: 3
  - Warranty: B
  - Metering: I/O Unit (online)
  - Purchase Option: 40%
  - Termination Charge Months: 5 Termination Charge Percent: 25%
  - Model/Feature Additional Charge in lieu of AU Charge: 10%
  - Upper Limit Percent: 0%

**Note:** From initiation (mounted supply reel) to "tape drive ready".

**Prerequisite:** Tapes must be attached to a selector channel or Selector Subchannel (special feature) of 2880, or a channel with the same speed of the 2880. On a S/360 mdl 85, 91, 195 or S/370 mdl 165, 195 to a shared subchannel of a 2880. On a S/370 mdl 155, 158, or 3031, 3032 or 3033 Processor only, a block multiplexer channel may be used. On a S/370 mdl 135, only a Selector Channel (special feature) may be used. On a S/370 mdl 135-3 or 136 only a block multiplexer channel may be used. 2420 mtl 7s must be attached to the block multiplexer channel on 4331 (special feature) or 4341 Processors.

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IBM DP Machines

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**2501 CARD READER**

**Purpose:** Punched card input unit for a S/360 mld 22 thru 85 and 195, any S/370 Processor, or any 4300 Processor. For description and use of the 2501 mld A1 or A2 with the 1130, System/3 or S/360 mld 20, see the GSD Manual.

**Model** | **Rated 80-column Card Speed**
---|---
B1 | 600/minute
B2 | 1,000/minute

**Model Changes:** Can be made only between mlds A1 and A2, or between mlds B1 and B2.

**Highlights:** The system's processing unit performs all format and field editing. Cards are read serially by a light sensing mechanism which checks for proper functioning in every card cycle. The Extended BCD Interchange Code (256 codes) can be read...invalid codes, off-punching and mispositioned cards are detected. Models B1 and B2 include their own control unit.

**Binary Codes:** A model B1 or B2 must be equipped with Card Image (#1531) to read binary codes...see "Special Features."

All models have a 1,200-card capacity hopper and a 1,300-card capacity stacker.

**Maximum:**
- S/360 mld 22 thru 85, 195, any S/370 Processor, or any 4300 Processor -- an available control unit position on a system channel.
- S/360 mld 25 -- special features on 2025: Multiplexer Channel, or Selector Channel...see 2025.
- S/360 mld 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channel...special features, except 2022, one selector channel is standard...see 2022, 2030, 2040, 2050.
- S/360 mld 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channel, Add'l High Speed Multiplexer Subchannel...see 2044.
- S/360 mld 65, 67, 75 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870...see 2860, 2870.
- S/360 mld 85, 195 or S/370 mld 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, or shared subchannel of 2880...see 2860, 2870, 2880.
- S/370 mld 115, 125 -- Multiplexer Channel (special feature)...see 3115, 3125.
- S/370 mld 135 -- multiplexer channel (standard), Selector Channels (special features), or Block Multiplexer Channel (special feature)...see 3135.
- S/370 mld 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features)...see 3135-3.
- S/370 mld 138 -- byte multiplexer channel (standard), block multiplexer channels (standard)...see 3138.
- S/370 mld 145 -- multiplexer channel (standard), selector channels...see 3145.
- S/370 mld 145-3 -- byte multiplexer channel (standard), block multiplexer channels...see 3145-3.
- S/370 mld 148 -- byte multiplexer channel (standard), block multiplexer channels (standard)...see 3148.
- S/370 mld 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard)...see 3155, 3158.
- 3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard)...see 3031 or 3032.
- 3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard).
- 4311 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional)...see 4331.
- 4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard)...see 4341.

**Performance Limitations:**
1. The 2501 is an unbuffered time-dependent machine. If the CPU does not reissue a new card read command within 19.4 ms for the 2501 mld B1, or 3.5 ms for the 2501 mld B2, the card reader performance will be reduced to one half the rated speed; or less if the processing time exceeds 100 ms, or 60 ms, respectively.
2. For S/370 mld 115 operating under DOS/VS, special precautions must be taken in order to operate the 2501 mld B2 near rated speed. Some methods for achieving this are to use either the Power/VS option or to use programs employing chained card read commands.
3. For S/370 mld 125, 135, 135-3 or 138 operating under DOS/VS, special precautions must be taken in order to operate the 2501 mld B2 at or near rated speed. Some methods for achieving this are to use either the Power/VS option or to use programs employing chained card read commands.

**Card Limitations:** Generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved:

**Internal Scores (before separation):** M-4, M-5, OM-2, OM-3, S1 and ID-3 (2" x 3-1/16" or 93/16" x 3-3/16" sizes only). **Note:** When using OM-2 or OM-3, reading must be terminated prior to the column that is scored.

**External Scores (after separation):** M-3, M-4, M-5, M-6, M-7, M-11, OM-2, CF-4 and CF-11. OM-3 may be used if the score is on the column 1 end. **Note:** Upper left corner cut required when the M-11 or C-11 is used on column 1 end. All other scores may result in unsatisfactory performance.

**Special Features:**

**Bibliography:** S/360 — GC20-0360 S/370 — GC20-0001

**Specify:** [1] Voltage (AC; 1-phase, 3-wire, 60 Hz) — S8992 for 208 V, or #9904 for 230 V. Must be consistent with system voltage.

**Color:** #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

**Isolation, Control Unit:** May be required on units shipped prior to December 29, 1967...see "Special Features" below.

**PRICES:**
- **Mdl** | **MAC/** | **RMC** | **Purchase MMMC**
---|---|---|---
- **2501 B1** | $336 | $16,310 | $84.00
- **B2** | 413 | 16,570 | 91.00

**Plan Offering:** Plan A, Additional Use Charge Rate: 10% Maintenance: C Per Call: 3 Warranty: B

**SPECIAL FEATURES:**

**CARD IMAGE (#1531):** [Model B1 or B2 only] Permits reading of cards with multiple punches in a single card column. When reading in card image mode (Data Mode 2), the validity check is suspended because all characters are considered valid.

**ISOLATION, CONTROL UNIT (#4700):** [Model B1 or B2 only] for field installation on units shipped prior to December 29, 1967...standard on units shipped after that] To turn power on or off on the CPU does not reissue a new card read command within 19.4 ms for the 2501 mld B1, or 3.5 ms for the 2501 mld B2, the card reader performance will be reduced to one half the rated speed; or less if the processing time exceeds 100 ms, or 60 ms, respectively.

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2502 CARD READER

Purpose: Punched card input unit for a 2770 or 3770 Data Communication System, a System/7 (5024), or an 8100 Information System via 3289 Printer mdls 3.

Model Rated 80-column Card Speed
A1 150/minute (not with System/7)
A2 300/minute (not with 8100)
A3 400/minute (3776-3, 3776-4, 3777 only)

Model Changes: Can be made in the field.

Highlights: On the 2772, 3289-3, 3774, 3775, 3776 or 3777 used for automatic entry of punched card data to the transmission line or to offline operation units. The 2772 Multi-purpose Control Unit or 3774, 3775, 3776 or 3777 Communication Terminal or 3289-3 printer performs all format control and analysis.

Cards are read serially by a sensing mechanism which is checked for proper functioning in every card cycle. EBCDIC (256 characters) or ASCII (128 characters) code can be read, depending upon the transmission code specified for the 2772, 3774, 3775, or 3777. EBCDIC (256 characters) can be read and transmitted by the 3289-3. ASCII is not applicable to the 3777-2. Invalid codes, off-punching and mispositioned cards are checked.

On the System/7, used for automatic entry of punched card data to the system. The 5024 I/O Attachment Enclosure (mdls 2 or 3) performs all format control and analysis.

Hopper capacity is 700 cards ... stacker capacity is 600 cards.

Card Limitations: Generally, scored cards require careful handling and a favorable environment. Use of the following has been approved.


Internal Scores: M-4, M-5, S-1, S-2, ID-1, ID-2 and ID-3.

All other scores may result in unsatisfactory performance.

C-4 corner cut cards cannot be used.

Prerequisites:
For Model A1 -- 2502 Model A1 Attachment (#8020) on the 2772 ... 3289-3, 3774, 3775 or 3776 and a 3782 Card Attachment Unit mdl 2 ... 2502 Card Reader Attachment (#8002) on the 3777.

For Model A2 -- 2502 Md1 A2 Attachment (#8021) on the 2772 ... 3289-2/5020 Card Reader Attachment (#8149) on the 3774, 3775 or 3776 and a 3782 Card Attachment Unit mdl 2 ... 2502 Card Reader Attachment (#8002) on the 3777 ... 5024 mdl 2 or 3 with System/7.

For Model A3 -- 3782/2502 Card Reader Attachment (#8149) on the 3776 mdl 3 or 4 and a 3782 Card Attachment Unit mdl 2 ... 2502 Card Reader Attachment (#8002) on the 3777.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz). For use with 2772 -- #9902 for 208 V, or #9904 for 230 V. Must be consistent with system voltage. For use with 3289-3, 3774, 3775, 3776, or System/7 -- #9901 for 115 V.

[2] Color: #9045 for gray when used with 2772 ... #9046 for white when used with 3289-3, 3774, 3775, 3776, or System/7.

[3] Documentation: One must be specified -- #9100 for use with a 2772, #9101 for use with a 3289-3, 3774, 3775 or 3776, #9102 for use with a 3777, or #9103 for use with a System/7.


<table>
<thead>
<tr>
<th>Mdl</th>
<th>MAC/ MRC Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2502</td>
<td>A1 143 $6,160</td>
<td>$50.50</td>
</tr>
<tr>
<td></td>
<td>A2 179 $6,800</td>
<td>50.50</td>
</tr>
<tr>
<td></td>
<td>A3 213 $6,800</td>
<td>65.00</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B Warranty: B Maintenance: C
Purchase Option: 30% Useful Life Category: 2 Per Call: 2

SPECIAL FEATURES (not with System/7 -- 5024)

INTERCHANGEABLE FEED, 51/80 COLUMN (#4650). Permits reading of 51 or 80-column cards. Operator can readily set up machine to read 51-column cards and reconvert it to read 80-column cards. Limitation: Cannot be installed with Interchangeable Feed, 66/80 Column (#4651).

OPTICAL MARK READ (#5450). [not with 3289 mdl 3, 3776 mdl 3 or 4 or 3777] For reading of up to 40 columns of marked data. Either marked and/or punched hole data can be read from the same card. Cards on which a mark was unacceptable are offset stacked and the reader continues operation when in line mode. Prerequisite: Optical Mark Read (#5450) on the 2772, or Optical Mark Read (#5455) on a 3782 mdl 2 attached to a 3774, 3776 or 3776 mdl 1 or 2.

Special Feature Prices: MAC/ MRC Purchase MMMC FIC

<table>
<thead>
<tr>
<th>Feature Prices</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interchangeable Feed</td>
<td>#4650</td>
<td>$31</td>
<td>$1,330</td>
</tr>
<tr>
<td>51/80 Column</td>
<td>4651</td>
<td>31</td>
<td>1,330</td>
</tr>
<tr>
<td>Optical Mark Read</td>
<td>5450</td>
<td>141</td>
<td>5,830</td>
</tr>
</tbody>
</table>

INTERCHANGEABLE FEED, 66/80 Column (#4651). Permits reading of 60 or 80-column cards. Operator can readily set up machine to read 60-column cards and reconvert it to read 80-column cards. Limitation: Cannot be installed with Interchangeable Feed, 66/80 Column (#4651).

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Purpose: Combination punched card I/O unit for a S/360 mdl 22 thru 85 and 195, any S/370 Processor, or any 4300 Processor.

For description and use of the model A1 with S/360 mdl 20, see GSD manual.

Model | Rated 80-col Card Speed | For use with
--- | --- | ---
B1 | 500/minute | S/360 mdl 22 thru 85 & 195

Model Changes: Can be made between mdl A1 and the 2520 Card Punch mdl A2 or A3, or between mdl B1 and the 2520 Card Punch mdl B2 or B3.

Highlights: All reading and punching format control and analysis are performed by the system's processing unit. The unit has a 1,200 card capacity hopper and two 1,300 card capacity stackers. The Extended BCD Interchange Code (256 codes) can be read or punched.

Binary Codes: A model B1 must be equipped with Card Image (#1531) to read or punch binary codes. See "Special Features."

Input Section: Reads serially while the preceding card is passing the punching station. The light sensing mechanism is checked for proper functioning in every card cycle. Invalid codes and mispositioned cards are detected.

Output Section: Punches parallel, row by row, while the following card is passing the read station. Blank or prepunched cards can be punched. Cards go to stacker 1 unless directed to stacker 2 by the processing unit. Punching is checked. Cards in which punch errors are detected are automatically selected into stacker 1 on model B1.

Maximum:
S/360 mdl 22 thru 85, 195, any S/370 Processor or any 4300 Processor -- the number of 2520 mdl B1s that can be attached depends upon the number of system channel control unit positions available.

PREREQUISITES:
S/360 mdl 22 thru 85, 195, or any S/370 Processor -- the mdl B1 includes its own control and requires an available control unit position on a system channel.

S/360 mdl 25 -- special features on 2025: Multiplexer Channel or Selector Channel ... see 2025.
S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.
S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, AddI High Speed Multiplexer Subchannels ... see 2044.
S/360 mdl 65, 67, 75 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.
S/360 mdl 85, 195 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.
S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.
S/370 mdl 135 -- multiplexer channel (standard), Block Multiplexer Channels (special features), Block Multiplexer Channels (special features) ... see 3135.
S/370 mdl 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.
S/370 mdl 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.
S/370 mdl 145 -- multiplexer channel (standard), selector channels ... see 3145.
S/370 mdl 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.
S/370 mdl 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.
S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.
S/370 mdl 165, 168, 195 -- selector channel of 2860, basic multiplexer channel of 2870. Selector Subchannels (special features) on 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.
3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.
4331 Processor -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.
4341 Processor -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

Card Limitations: Generally, scored cards require careful handling and a favorable environment. Use of the following has been approved.

Internal Scores (before separation) -- M-4, either OM-2 or OM-3 without round corner cut on score, ID-1, ID-2, ID-3, S-1 ... OM-2 and OM-3 with round corner cut may be used if the score is in column 27 ... M-5 may be used if the operator limits the stacker to 1,000 cards ... cards folded at the crease (Card Fold Crease S-2) must be properly flattened. Note: When using OM-2 or OM-3, reading must be terminated prior to the column that is scored.

External Scores (after separation) -- M-3, M-4, M-5, M-6, M-7, M-11, CT-4 and CF-11 ... OM-2 may be used if the score is on the column 1 end.

All other scores may result in unsatisfactory performance. Aqua cards and C-4 corner cut cards cannot be used.


SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz) ... #9003 for 208 V, or #9005 for 230 V ... must be consistent with system voltage.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
[3] Isolation Feature: May be required on units shipped prior to December 29, 1967 ... see "Special Features."

PRICES: Mdl 250 B1 $1,180 $44,420 $286
Plan Offering: Plan A, Additional Use Charge Rate: 10%; Maintenance: C, Per Call: 3 Warranty: B
Metering: I/O Unit (Online) Purchase Option: 40%

SPECIAL FEATURES
CARD IMAGE (#1531). Permits reading and punching cards with multiple punches in a single column. When reading in card image mode (Data Mode 2), validity checking is suspended because all characters are considered valid.

ISOLATION, CONTROL UNIT (#4700). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2520 without generating spurious signals. Thus, a CPU program, if it can logically disconnect from the system before power is turned off, can continue operating. Prerequisite: in all cases there are compatible EC level requirements.

Special Feature Prices:  
Card Image #1531 $37 $1,740 $1.00 $118  
Isolation, Control Unit 4700 NC NC NC NC  

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For description and use of the model A2 or A3 with any between A2 or A3 and a Punches parallel, row by row. Blank or prepunched cards can be Model Changes: Can be made between mdl A2 and A3, or Prerequisites: unit positions available.ing errors are detected are automatically selected into stacker 1 change Code (256 codes) can be punched. Binary Codes: A model B2 or B3 can punch binary codes when be attached depends upon the number of system channel control Processor selectors channel is standard) ... see S/360 S/360 mdl Subchanpels (special features), Block Multiplexer Channel (special feature) ... see 135. Byte Multiplexer Channel (special feature), block multiplexer channels (standard), block multiplexer channels (five are standard) ... see 3135-3. Multiplexer Channels (special features), Block Multiplexer Channel (special feature) ... see 135. Multiplexer Channels (special features), selector channel of ... see 3145-3. Multiplexer Channels (special features), block multiplexer channel of ... see 3145-3. Multiplexer Channels (special features), Block Multiplexer Channel (special feature) ... see 3145-3. Multiplexer Channels (special features), Block Multiplexer Channel (special feature) ... see 3145-3. Multiplexer Channels (special features), Block Multiplexer Channel (special feature) ... see 3145-3.
IBM

2540 CARD READ PUNCH

Purpose: Combination punched card I/O unit for a S/360 mdl 22 thru 85, 195, any S/370 Processor, or any 4300 Processor.

Highlights: When used in conjunction with a 2821, fully buffered card reading and punching is provided. When attached to a 2821 via the Integrated 2540 Attachment (#4591), card reading and punching is buffered directly into core memory.

The system's processing unit performs all format control and analysis. The unit has five 1,350-card capacity stackers located between the read and punch feeds. The center stacker can be fed from either feed, but should be reserved to only one side during a machine run. The Extended BCD Interchange Code (256 codes) can be read or punched.

Input Section -- cards are fed from a 3,100-card capacity file feed at a rated speed of 1,000 cards/minute ... limited to 800 cards/minute when 51-column Interchangeable Read Feed (#4151) is installed. Actual speed depends upon the operation. Cards go to the normal (R1) stacker unless program-directed to stacker R2 or R3 (center stacker). Has two sets of reading brushes ... first for "hole-count" ... second for reading and "hole-count" proving. Invalid codes set an error indicator.

Output Section -- cards are fed from a 1,350-card capacity hopper at a rated speed of 300 cards/minute. Actual speed depends upon the operation. Cards go to normal (P1) stacker unless program-directed to stacker P2 or P3. Reading brushes check "hole-counts" and cannot read data into the system. Only blank cards can be fed through the punch feed. Pre punched cards cause incorrect "hole-counts" which set error indicator and direct error cards to stacker P1.

Prerequisites:

S/360 mdl 22, 30 thru 85, 195, any S/370 Processor or any 4399 Processor -- a 2821 Control Unit mdl 1, 4, 5 or 6. Note: 2540 Compatibility Attachment (#8065) is required on the 2821 if the 2540 is to be used in compatibility mode with a 2820 equipped with 1401/1440/1460 Basic Compatibility and 1402/1403 Attachment (#4463), with a 2030 equipped with 1620 Compatibility (#7190), or with a 2040 equipped with 1401/1460 Compatibility (#4457).

S/360 mdl 25 -- a 2540 can be attached via the Integrated 2540 Attachment (#4595) on the 2025, or via a 2821 Control Unit mdl 1, 4, 5 or 6 attached to a Multiplexer Channel (#5249) or Serial Channel (#6960) on the 2025. When attached via #4595 on the 2025, a S/360 Model 25 Adapter (#9725) is required on the 2540 ... see "Specify."

Card Limitations: Prepunched cards can be processed through the punch feed only if Punch Feed Read (#5890) is installed ... see "Special Features."

When attached to a 2821, binary cards and cards with multiple significant digit punching in a single column can be processed only if Column Binary (#1990) is installed on the 2821. Column binary is standard on the Integrated 2540 Attachment (#4595) on the 2025.

Because cards are stacked on end, internally scored cards (M-3, O4473) or cards that have been folded at the crease (S-2) are not recommended for use ... only the following have been approved for use: Before separation -- M-4, S-1; after separation -- M-3, M-4, M-5, M-7, M-11, CF-4, CF-11.


Specify: [1] Voltage (AC, 3-phase, 4-wire, 60Hz); #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.


SPECIAL FEATURES

51-COLUMN INTERCHANGEABLE READ FEED (#4151). [plant installation only] For 80 or 51-column cards ... read feed only. The 51 columns correspond to columns 15 through 65 of an 80-column card. A card weight, adapter tray, and removable side plates are provided for the standard feed file. Two card stackers, R1 and R2, are modified so that the operator can adjust for 80 or 51-column operation. When the stackers are set for 51-column mode, the system reads only the 51 columns of data in read positions 15 through 65 and the capacity of stackers R1 and R2 is reduced to 800 cards. Limitation: When this feature is installed, reading speed is permanently reduced from 1,000 cpm to 800 cpm.

PUNCH FEED READ (#5890). For punching output data into the same card from which input data was read. Adds a special set of 80 reading brushes one station ahead of the punch station. Limitations: Column binary cards cannot be read in the punch feed ... refer to SRL GA21-9033 for limitations on use of pre-punched cards. Prerequisite: When attached to a 2821, Punch Feed Control (#5895) on the 2821 ... when attached to a 2025 via Integrated 2540 Attachment (#4595), Punch Feed Read Control (#5895) on the 2025.

TWO CHANNEL SWITCH ADAPTER (#8102). Required if the 2540 is to be used with a 2821 equipped with a Two Channel Switch (#8100) ... permits the read and punch feeds of the 2540 to be reset independently. Prerequisite: Two Channel Switch (#8100) on 2821.

Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMC/M</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>51-col Inter Read Feed #4151</td>
<td>$80</td>
<td>$4,030</td>
<td>$35.50</td>
<td>PO</td>
</tr>
<tr>
<td>Punch Feed Read 5890</td>
<td>33</td>
<td>1,045</td>
<td>5.50</td>
<td>$241</td>
</tr>
<tr>
<td>Two Chnl Switch Adptr 8102</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
</tbody>
</table>

MAC/ MRC Purchase MMC/M FIC

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Maintenance: C Per Call: 3 Warranty: B

Purchase Option: 45% Metering: I/O Unit (Online)

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2560 MULTI-FUNCTION CARD MACHINE

Purpose: A multi-function card input/output unit for a S/360 mld 25, or a S/370 mld 115 or 125. For use with System/3 model 15 or S/360 mld 20, see GSD manual.

Model A1  For native attachment to a 2025, 3115 or 3125, or for a 5415.

Model A2  For a S/370 mld 115, or for a 5415.

Model Changes: Can be made in the field only from mdl A2 to A1 (without Card Print feature).

Highlights: Provides the combined functions of a card reader/punch, collator, and, with Card Print (#1575 - 1577) on a mdl A1, card interpreter/document printer in one unit. Permits collating, gangpunching, reproducing, summary punching, punch­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­­}&dquo; or a maximum of five passes for C-4. For reading only: On column 80 end -- M-4, M-5, M-11 and CF-11.

*Punching not recommended if card has O.K. verify notch. All other scores may result in unsatisfactory performance.

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Purpose: Paper tape input unit for a S/360 mdl 22, 25, 30, 40, 44, 50, 67 or S/370 mdl 115 thru 158, a 3031 or 3032 Processor, or any 4300 Processor.

with the addition of special features, also reads reels or rolls of tape. See "Special Features."

Tape can be .11/16" (5-track telegraphic code), 1" (8-track code), or 7/8" (6 and 7-track codes) ... any of the three tape widths can be selected by the operator by a switch setting. Tape is Chad type.

Reads at up to 1,000 characters/second. Addition of special features for reel or roll input and takeup provide for center roll or reel feeding and reel rewinding at a minimum of 500 characters/second. With these special features installed, strip reading can still be accomplished at up to 1,000 characters/second.

Buttons and switches are used to set particular end-of-record codes, tape codes and widths, parity, and delete recognition. Lights signal status conditions.

Supplies: The following tapes, or their equivalents, are used -- 190216 or 304469

Prerequisite: Each 2671 requires a 2822 Paper Tape Reader Control ... the 2671 is placed on top of the 2822 as a table-top reader.

Limitation: Unlike the 1011 Paper Tape Reader, the standard 2671 does not have the ability to read feed holes.


Specify: Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.

PRICES: Mdl MRC Purchase MMMC
2671 1 $156tti $5,785tti $35.50

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Maintenance: C Per Call: 3 Warranty: B

Purchase Option: 45%

Metering: I/O Unit (Online ... meters 2822)

SPECIAL FEATURES

CENTER ROLL FEEDING (#1842). For feeding 10-1/2" rolls from the center. Prerequisite: Supply Option (#7580).

SUPPLY OPTION (#7580). For feeding 10-1/2" rolls from the outside.

TAKE-UP OPTION (#7812). Provides 10-1/2" reels for rewinding tape. Prerequisite: Supply Option (#7580).

Special Feature Prices: MAC/ MRC Purchase MMMC FIC
Center Roll Feeding #1842 $28 $1,060 $5.50 $100*

Supply Option 7580 38 1,205 8.50 500

Take-up Option 7812 38 1,205 7.00 399

* if #1842 and #7580 are installed at the same time, the FIC for #7580 covers both.

††† Manufactured in France. Shipping charges from point of shipment in U. S.

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MULTIPLE SUPPLIER SYSTEMS POLICY

In these pages, the term "Data Terminal Equipment" and its abbreviation "DTE" will mean any business machine which has a telecommunications capability, be it a terminal, a multiplexer or a CPU with an integrated communications adapter.

Also, the term "Data Communications Equipment" and its abbreviation "DCE" will mean any equipment whose function it is to convert DTE signals into a form suitable for transmission over a communications facility, and to convert signals received from a communications facility into a form suitable for transfer to a DTE. This DCE may be a modem (Modulator/DeModulator), a telegraph line adapter or another type of signal converter equipment.

Finally, the term "Automatic Calling Equipment" and its abbreviation "ACE" will mean that equipment which will accept dial digits from the DTE and present them to the telephone central office for the purpose of effecting a switched network connection.

ORGANIZATION

These pages are organized into three communications capability charts, which are:
- #1, IBM Start/Stop DTE Intercommunication Capability Table
- #2, IBM Synchronous DTE Intercommunication Capability Table
- #3, IBM Parallel Tone DTE Intercommunication Table

and seven communication facility charts which are:
- #A, Common Carrier Private Line (non-switched) Telegraph Channels
- #B, Common Carrier Private Line (non-switched) Voice Grade Channels
- #C, Common Carrier Private Line (non-switched) Digital Data Channels
- #D, Customer Owned & Maintained Limited Distance Facilities
- #E, Common Carrier Parallel Transmission Channels
- #F, Common Carrier Private Line (non-switched) Digital Data Communications Services
- #G, Customer Proprietary Network Facilities

UTILIZATION

To utilize these pages:
- First, refer to the appropriate intercommunications chart, finding the desired DTEs, and determining if they are capable of intercommunications.
- At the intersection of the row and column associated with the desired DTEs, read the alphabetic designations for the facilities over which they may communicate.
- Refer to the charts for the facilities so designated to find the particular facility and the required feature codes for the DTEs which will allow their communication.
- Refer to the individual "Machines" sales manual pages for the DTEs to determine prerequisites, restrictions, etc.

For example, assume that communications between a 2740 mdl 2 and a 3705 is desired. Since this would obviously be in Start/Stop mode, the first reference would be to Chart 1.

- In Chart 1, at the intersection of the 2740 mdl 2 row and the 3705 column, the entry reads "ADG". This entry points to Facility Charts A, D and G.

- Reference to these Charts show that, since feature codes are entered for both the 2740 mdl 2 and the 3705, communications between them is possible over Facilities A4, D1, D1M, D2, D2M, G1 and G2.

- Further, the A, D and G Facility Charts show, for both the 2740 mdl 2 and the 3705, the feature codes required on each to allow this intercommunications.

- Finally, reference should be made to the M 2704 and M 3705 pages to assure that any restrictions or prerequisites to the installation of the indicated features are satisfied.

MULTIPLE SUPPLIER SYSTEMS POLICY

Non-IBM modems are attached to IBM DTEs under the provision of the IBM Multiple Supplier Systems Policy CPU. Such attachments are delineated in the "M" suffix facilities in these pages, and information on the DCEs so attached is available. See "Reference Material" following.

The customer must be advised in writing, that:
- He is responsible for making arrangements for price quotations, installation and cost (initial and recurring) of the common carrier supplied facilities/services.
- He is responsible for all toll charges incurred in the installation and maintenance of the IBM equipment.
- He must be prepared to relinquish the system for service in those cases in which service aids or available error message printouts do not permit localization of a malfunction to the communications facility or terminal location.
- He is responsible for the DTE/DCE and DTE/ACE interface compatibility when he, or the common carrier, provides the DCE or ACE.
- He is responsible to perform the set up procedures for customer set-up terminal products.
- He is responsible for using and following problem determination procedures and using recovery routines as furnished by IBM for the 3767 and 3770 terminals prior to calling IBM for service.

Due to the nature of the teleprocessing environment, it is possible that the throughput anticipated on the specified network configuration with recommended channel conditioning will not be achieved. The probability of this is slight, though it is more likely at the higher data signalling rates or when using an acoustic coupler. Some actions that can be taken if anticipated throughput is not achieved are:
- re-dialing the connection if operating on the Public Switched Telephone Network
- adjusting the block size, where possible, to optimize throughput based on the error characteristics of the communications facility being used
- requesting the Common Carrier, if appropriate, to provide alternate routing or facility improvements. This is normally provided at extra cost. The Common Carrier’s representative should be contacted for further details.

However, it is possible that, at a particular location, only lower speed operation will be possible.

In addition, the customer should be advised that his local IBM representative is available to assist him in analyzing and planning for his responsibilities in installing or operating teleprocessing configurations.

When using IBM Modems, IBM Integrated Modems or IBM Line Adapters, it is recommended that the customer investigate the economics of providing alternate voice service to facilitate installation and maintenance.

MULTIPOINT OPERATION

Duplex communications facilities are required for multipoint systems in which:
- the DCE at the control station is a 1200 bps Integrated Modem, or
- it is desired that a continuous carrier be maintained on the line from the control station thereby eliminating the control station "Ready for Sending" delays.

The use of duplex facilities and the operation in the continuous carrier mode is strongly recommended since operation in a non-continuous carrier mode (by the control station) will subject the system to inordinate delays, particularly in the polling and addressing sequences.

MULTIPLE SUPPLIER SYSTEMS POLICY

CPU. Such attachments are delineated in the "M" suffix facilities in these pages, and information on the DCEs so attached is available. See "Reference Material" following.

CUSTOMER RESPONSIBILITIES

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**CHART 2**

Synchronous Data Terminal Equipment Intercommunication Capability Chart

|   | 2701 | 2703 | 2715 | 3115 | 3125 | 3135 | 3271 | 3271 | 3274 | 3275 | 3276 | 3276 | 3276 | 3601 | 3602 | 3603 | 3604 | 3614 | 3631 | 3632 | 3651 | 3651 | 3651 | 3650 | 3661 |
|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 2701 | CDEX | CD | CD | DDEX | DDEX | CDX | DX | DX | CDX | DX |
| 2703 | CD | CD | CD | CD | CD | CD | D | CD |
| 2715 | CD | CD | CD | CD | CD | CD | CD |
| 3115 | CDEX | CD | CDEX | DDEX | CDX | DX | DX | CDX | DX |
| 3125 | CDEX | CD | CDEX | DDEX | CDX | DX | DX | CDX | DX |
| 3135 | CDEX | CD | CDEX | DDEX | CDX | DX | DX | CDX | DX |
| 3271 | 1,2 | 11,12 | 1C | 12 | 1-4 | 11-14 | 3602 | 3603 | 3604 | 3614 | 3632 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3274 | 3275 | 3276 | 3276 | 3601 | 3602 | 3603 | 3604 | 3614 | 3624 | 3632 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3275 | 3275 | 3276 | 3276 | 3601 | 3602 | 3603 | 3604 | 3614 | 3624 | 3632 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3276 | 3276 | 3276 | 3276 | 3601 | 3602 | 3603 | 3604 | 3614 | 3624 | 3632 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3601 | 3602 | 3603 | 3604 | 3614 | 3624 | 3632 | M25 | M50 | M75 | 3650 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3602 | 3603 | 3604 | 3614 | 3624 | 3632 | M25 | M50 | M75 | 3650 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3603 | 3604 | 3614 | 3624 | 3632 | M25 | M50 | M75 | 3650 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3604 | 3614 | 3624 | 3632 | M25 | M50 | M75 | 3650 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3614 | 3624 | 3632 | M25 | M50 | M75 | 3650 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3624 | 3632 | M25 | M50 | M75 | 3650 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3632 | M25 | M50 | M75 | 3650 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3651 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3651 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3651 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3651 | 3651 | 3651 | 3651 | 3650 | 3661 |
| 3651 | 3651 | 3651 | 3651 | 3650 | 3661 |

**Note:** Refer to the M 2700 pages in the GSD manual for the applicable facilities and their associated feature/specify #s.

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** ** Refer to the M 2700 pages in the GSD manual for the applicable facilities and their associated feature/specify #s.

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Notes for CHART 1, 2 and 3

[1] The TTY terminals referred to are Telephone Company ISDN or Western Union Plan 115A terminals.

[2] The 2715 mdl 2, 3271 mdl 1, 2, 3275 mdl 2, 3735, 3780, System/3, System/32, System/34, S/360 mdl 20 or BSC equipped 3771s, 3773s, 3774s, 3775s, 3776s or 3777 mdl 1s can be intermixed as tributary stations on a multipoint non-switched line. The control station must be one of the following:
   - a S/370 mdl 115, 125, 135 or 138 with an Integrated Communications Adapter and the appropriate BSC features.
   - a S/370 with an attached, appropriately configured, 2701, 2703, 3704 or 3705 ... see the M 2701, 2703, 3704 and 3705 pages for the CPU models to which these multiplexers may be attached.

See SRL GA27-3004 for information on which BSC terminals may communicate with each other over point-to-point non-switched lines.

See SRLs GC30-1005, GC30-2004 and GC30-5001 for the limitations and restrictions on these types of operations.

[3] Appropriately configured 2701s, 2703s, 2715 mdl 2s, 3684s, 3704s, 3705s, 3735s, 3741s, 3747s, 3771s, 3773s, 3774s, 3775s, 3776s, 3777s, 3780s, System/3s, System/32s, System/34s, and S/370 mdl 115s, 125s, 135s and 138s may communicate over the public telephone network to the same BSC line appearance on a S/370 mdl 115, 125 or 135 or a S/370 with an attached, appropriately configured 2701, 2703, 3704 or 3705.

See SRLs GC30-1005, GC30-2004 and GC30-5001 for the limitations and restrictions on this type of operation.

[4] The 3271 mdl 11 and 12, 3274, 3275 mdl 12, 3276, 3601, 3602, 3614, 3624, 3631, 3632, 3635, 3636, 3637, 3771, 3773, 3774, 3775, 3776, 3777 (except 3777-2), 3791, System/32 and System/34 may communicate over a non-switched voice grade line with a 3704 or 3705 using Synchronous Data Link Control. This communications uses the Synchronous Data Link Control, in which the control station may be receiving from one tributary station while it is transmitting to a second tributary station. For this mode of operation, a duplex communications facility and a duplex line set at the 3704/3705 is required. Normal half-duplex or duplex communications facilities is also supported.

The 3604 and 3614 can be featured with a loop integrated modem (#8001) for attachment to the 3600 System Controller via communication facilities. The 3604 and 3614 can provide a remote subloop for 3600 System terminals. The 3603 also provides a remote subloop and the interface to communication facilities.

[5] See the SCP Programming pages for information on which intercommunications capability is supported by the 3704/3705 Emulation and Network Control Programs.

[6] Appropriately configured 3271 mdl 11s and 12s, 3275 mdl 12s, 3601s, 3602s, 3631s, 3632s, 3635s, 3636s, 3637s, 3638s, 3639s, 3771s, 3773s, 3774s, 3775s, 3776s, 3777 mdls, 3780s, System/32s and System/34s may be intermixed as tributary stations on a multipoint non-switched line. All such intermixed stations and the control station must be operating with the same clocking source (either modem or business machine) and at the same transmission speed. The control station must be a S/370 with an attached 3704 or 3705.

[7] Appropriately configured 3601s, 3602s, 3631s, 3632s, 3651 mdls, 3684s, 3767s, 3771s, 3773s, 3774s, 3775s, 3776s, 3777s, 3791s, System/32s and System/34s may communicate over the public switched telephone network to the same SDLC line appearance on a 3704 or 3705 attached to a S/370. All DTEs so communicating must be operating with the same clocking source (either modem or business machine) and at the same transmission speed.

[8] Communications between a 3767 (Start/Stop Mode) and 3704 or 3705 utilizing 1200 bps Integrated Modems is supported in VS using the appropriate level of EP and/or NCP. The same 3767 Start/Stop configurations are also supported in non VS systems except 2741 on two-wire facilities.

[9] The 3276 mdl 12 may be attached as tributary stations on a multipoint or point-to-point non-switched line where the control station is a 3791 equipped with a Data Link Adapter (#3210 and/or #3211). All stations on such a line must operate at the same speed and use the same type clocking source, i.e., either modem or business machine clock.

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CHART A
COMMON CARRIER PRIVATE LINE (NON-SWITCHED) TELEGRAPH CHANNELS

FACILITY A1 - Point-to-point or Multipoint Start-stop Operation @ 45.5 bps on a Type 1002 Channel (or equivalent). (1)

IBM Machine Type 2701 2702 2703 3125 3705
Telegraph Line 7860 7911 7911 7881 4721
Adapter 9680 4873 9733 9601
7895 7876 (2)
7897 (3)

FACILITY A2 - Point-to-point or Multipoint Start-stop Operation @ 56.9 bps on a Type 1002 Channel (or equivalent). (1)

IBM Machine Type 2701 2702 2703 3125 3705
Telegraph Line 7861 7911 7911 7881 4721
Adapter 9681 4874 9734 9602
7895 7876 (2)
7897 (3)

FACILITY A3 - Point-to-point or Multipoint Start-stop Operation @ 74.2 bps on a Type 1002 Channel (or equivalent). (1)

IBM Machine Type 2701 2702 2703 3125 3705
Telegraph Line 7862 7911 7911 7881 4721
Adapter 9682 4875 9735 9603
7895 7876 (2)
7897 (3)

FACILITY A4 - Point-to-point or Multipoint Start-stop Operation @ 75 bps on a Type 1005 Channel (or equivalent).

IBM Machine Type 2702 2703 M2 3125 3705
Telegraph Line 4615 4696 7807 7881 4721
Adapter 9683 4876 9736 9604
7895 7876 (2)
7897 (3)

NOTES FOR CHART A

1. The terminals on the A1 through A3 Facilities are Telephone Company Type 83B2 or 83B3 or Western Union Plan 115A terminals.
2. The 3115 and 3125 feature codes are for the attachment of the first communications line. See the M 3115 and M 3125 pages for additional line attachment feature codes.
3. The 2703 Line Set feature code (#7897) is for the attachment of up to eight communications lines. See the M 2703 pages for additional line attachment feature codes. When two 2703s are operated in series on the same telegraph channel, RPQ (no charge) must be installed on one 2703 and RPQ (no charge) must be installed on the other 2703. These RPQs are not required to operate two telegraph line appearances on the same 2703 in series on the same telegraph channel.

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**FACILITY C1** - Start-stop Operation @ 300 bps on the Public Switched Telephone Network.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>IBM Machine Type 3704</th>
<th>IBM Machine Type 3705</th>
<th>IBM Machine Type 3767</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200 bps Integrated Modem</td>
<td>4782 7111</td>
<td>9612</td>
<td>7113, 9540, 5502</td>
</tr>
<tr>
<td>1200 bps Integrated Modem with Interrupt</td>
<td>4786 7113</td>
<td>9612</td>
<td>9540, 5506</td>
</tr>
</tbody>
</table>

**FACILITY C1M** - Start-stop Operation @ 134.5 bps or 300 bps on the Public Switched Telephone Network via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy.

| IBM Machine Type | IBM Machine Type 2701 | IBM Machine Type 2702 | IBM Machine Type 2703 | IBM Machine Type 2741 | IBM Machine Type 3125 | IBM Machine Type 3135 | IBM Machine Type 3138 | IBM Machine Type 3705 | IBM Machine Type 3767 | IBM Machine Type 3792 | IBM Machine Type 3798 | IBM Machine Type 3846 | IBM Machine Type 4331 | IBM Machine Type CMCST |
|------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Interface to Stand-alone DCE | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 |
| 1200 bps Integrated Modem | 4782 7111 | 9612 | 7113, 9540, 5502 |
| 1200 bps Integrated Modem with Interrupt | 4786 7113 | 9612 | 9540, 5506 |

**FACILITY C2** - Start-stop Operation @ 110 bps, 134.5 bps or 150 bps on the TWX Network.

| IBM Machine Type | IBM Machine Type 2701 | IBM Machine Type 2702 | IBM Machine Type 2703 | IBM Machine Type M1 | IBM Machine Type 2741 | IBM Machine Type 3125 | IBM Machine Type 3135 | IBM Machine Type 3138 | IBM Machine Type 3705 | IBM Machine Type 3767 | IBM Machine Type 3792 | IBM Machine Type 3798 | IBM Machine Type 3846 | IBM Machine Type 4331 | IBM Machine Type CMCST |
|------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Interface to Stand-alone DCE | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 | 5825 3255 |
| 1200 bps Integrated Modem | 4782 7111 | 9612 | 7113, 9540, 5502 |
| 1200 bps Integrated Modem with Interrupt | 4786 7113 | 9612 | 9540, 5506 |

**FACILITY C3** - Synchronous Operation @ 600 bps on the Public Switched Telephone Network.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>IBM Machine Type 3704</th>
<th>IBM Machine Type 3705</th>
<th>IBM Machine Type 3767</th>
<th>IBM Machine Type 4331</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200 bps Integrated Modem</td>
<td>4782 9531 4782</td>
<td>9607 5502</td>
<td>4783, 967X, 969X, 1601, 4696</td>
<td></td>
</tr>
</tbody>
</table>

**FACILITY C3M** - Synchronous Operation @ 600 bps on the Public Switched Telephone Network via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>IBM Machine Type 3115</th>
<th>IBM Machine Type 3125</th>
<th>IBM Machine Type 3135</th>
<th>IBM Machine Type 3138</th>
<th>IBM Machine Type M2</th>
<th>IBM Machine Type 3704</th>
<th>IBM Machine Type 3705</th>
<th>IBM Machine Type 3767</th>
<th>IBM Machine Type 3792</th>
<th>IBM Machine Type 3798</th>
<th>IBM Machine Type 3846</th>
<th>IBM Machine Type 4331</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface to Stand-alone DCE</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td>7414 4640 3440 4714 4714 3719</td>
<td></td>
</tr>
<tr>
<td>1200 bps Integrated Modem</td>
<td>4782 9531 4782</td>
<td>9607 5502</td>
<td>4783, 967X, 969X, 1601, 4696</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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## FACILITY C4 - Synchronous Operation @ 1200 bps on the Public Switched Telephone Network.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to Stand-alone DCE</th>
<th>(3)</th>
<th>(2)</th>
<th>9777</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3276 M11-</td>
<td>2701 2703 M2 3115 3125 3135</td>
<td>640</td>
<td>260</td>
<td>640</td>
<td></td>
</tr>
<tr>
<td>2400 bps Integrated Modem</td>
<td>1290</td>
<td>1295</td>
<td>1290</td>
<td>1290</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td>9615</td>
<td>9615</td>
<td>9615</td>
<td>9615</td>
<td></td>
</tr>
<tr>
<td>1200 bps Integrated Modem</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td></td>
</tr>
</tbody>
</table>

## FACILITY C4M - Synchronous Operation @ 1200 bps on the Public Switched Telephone Network via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to Stand-alone DCE</th>
<th>(3)</th>
<th>(2)</th>
<th>9777</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3276 M11-</td>
<td>2701 2703 M2 3115 3125 3135</td>
<td>640</td>
<td>260</td>
<td>640</td>
<td></td>
</tr>
<tr>
<td>2400 bps Integrated Modem</td>
<td>1290</td>
<td>1295</td>
<td>1290</td>
<td>1290</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td>9615</td>
<td>9615</td>
<td>9615</td>
<td>9615</td>
<td></td>
</tr>
<tr>
<td>1200 bps Integrated Modem</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td></td>
</tr>
</tbody>
</table>

## FACILITY C5 - Synchronous Operation @ 2400 bps on the Public Switched Telephone Network.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to IBM 3872 Modem or IBM 3863 Modem</th>
<th>(3)</th>
<th>(2)</th>
<th>9777</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3276 M11-</td>
<td>2701 2703 M2 3115 3125 3135 3138 3142 M1 14 M5 M7 M11 M2</td>
<td>1481</td>
<td>1481</td>
<td>1481</td>
<td>1481</td>
</tr>
<tr>
<td>2400 bps Integrated Modem</td>
<td>1290</td>
<td>1295</td>
<td>1290</td>
<td>1290</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td>9615</td>
<td>9615</td>
<td>9615</td>
<td>9615</td>
<td></td>
</tr>
<tr>
<td>1200 bps Integrated Modem</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td>1200</td>
<td></td>
</tr>
</tbody>
</table>

## Chart C (cont'd)

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---- - ---= =- ---

- ---- =':' =

M 2700.8
Jul 79
DP Machines

CHART C

(cont'd)

FACILITY C5M - Synchronous Operation @ 2000 or 2400 bps on the Public Switched Telephone Network via Stand-alone DCEs attached
under the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type

2701 2703

Interlace to
Stand-alone DCE

7698 7710
(3)
(8)

Interface to
Stand-alone ACE
(5)

IBM Machine Type
Interface to
Stand-alone DCE

2715
M2 3115 3125
(4)

3135 3138

3276
M11- 3601 3631
12 3602 3632

3704
(cont'd
3684 3705 3735 below)

7151 7131
(2) 9758
or
7151
(2)

4640 4640 9821 4502 4502 3701
(18)
9609 9609 or
or
or
9625 9649 9822. 6302. 6302.
9649 (2) 3701 3701 3701
(2)
6302
9490

4714
(9)

1314 1340
(3)

1295 1295
(2)
(2)

1290 1290
9777 9777
(2)
(2)

4715

3774,
3775,
3776
M1,2
3771 3777
3767 3773 M1,2

3776
M3,4
3777
M3
3780

3718 1481 1481
9533 3701 3701
9619

3701

9120
9402

(4)

8101
3791 3845
8130
M1,2 3846 4331 8140
3701 (16.
17)
6302
or
6303
(12)

1601 1602.
4695 3701
3701
967X
or
969X
(19)

Interface to
Stand-alone ACE (5)
FACILITY C6 - Synchronous Operation @ 4800 bps on the Public Switched Telephone Network.

IBM Machine Type

2715 3115
2701 2703 M2 3125 3135

3651
3276
M25,
M11- 3601 3631 M50,
3138 14 3602 3632 M75

3771,
3773
3704
3774,3776
3684 3705 3735 3775 M1,2

4800 bps Integrated
Modem

5710
(14)

Interface to IBM
3874 Modem or
IBM 3864 Modem

7698 7710
(8)
(3)

Interface to ACO
Feature (#1091)
on IBM 3874

1314 1340
(3)

IBM Machine Type

3776
M3,4
3777 3771 (cont'd
M3 M1,2 below)

(4)

7151
(2)

4640
9609
9625
9649
(2)

4640
9609
9649
(2)

1295 1290
(2) 9777
(2)

1290
9777
(2)

3701 4502 4502 91 26
6302 or
or
9490 6302. 6302.
9823 3701 3701

3701

4714
(9)

(4)

1481
3701

1481
3701

3701

1481
3701

4715

8101
3845
8130
3780 3791 3846 4331 8140

4800 bps Integrated
Modem
Interface to IBM
3874 Modem or
IBM 3864 Modem

9128 3701 (16,
9402 6303 17)
(12)

1601 1602.
4695 3701
3701
967X
or
969X
(19)

Interface to ACO
Feature (#1091)
on IBM 3874

FACILITY C6M - Synchronous Operation @ 4800 bps on the Public Switched Telephone Network via Stand-alone DCEs attached under
the provisions of the IBM Multiple Supplier Systems Policy

IBM Machine Type

2701 2703

Interface to
Stand-alone DCE

7698 7710
(8)
(3)

Interface to
Stand-alone ACE
(5)

1314 1340
(3)

2715 3115
M2 3125 3135
(4)

3276
M11- 3601 3631
3138 14 3602 3632 3684

7151 4640
(2) 9609
9625
9649
(2)

4640
9609
9649
(2)

1295 1290
(2) 9777
(2)

1290
9777
(2)

3701 4502 4502 3701
6302 or
or
9490 6302. 6302.
9823 3701 3701

3771,3776
3773, M1,2
3704
3774,3777
3705 3735 3715 M1,2
4714
(9)

(4)

1481
3701

1481
3701

4715

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3776
M3,4
3777
M3
3701

3780 3791
9128 3701
9402 6303
(12)

(cont'd
below)


NOTES FOR CHART C

2. The 3115, 3125, 3135 and 3138 feature codes listed are for the attachment of the first communications line. See the M 3115, M 3125 and M 3135 pages for additional line attachment feature codes.

3. The 2703 Line Set feature codes (#3205, #7710) and Autocall feature code (#1340) are for the attachment of up to eight start-stop communications lines, up to four synchronous communications lines or up to eight stand-alone ACEs. See the M 2703 pages for additional line attachment and additional ACE attachment feature codes.

4. No special feature is required to attach this DTE to this facility.

5. "ACE", Automatic Calling Equipment, refers to the unit which accepts dial digits from the DTE and presents them to the telephone central office.

6. CE-TWX (Customer Equipment - TWX) is a Service on which IBM DTEs may communicate with each other over the TWX network. CPT-TWX (Customer Provided Terminal - TWX) is a Service in which IBM multiplexers or CPU integrated communications adapters may communicate with common carrier provided TWX 33/35 or TWX 37 terminals over the TWX network.

7. "ACO", Automatic Call Originate, refers to the feature on the IBM 3872 and 3874 Modems and on the 1200 bps and 2400 bps Integrated Modems which permits automatic dialing (under program control) of a remote terminal. When this feature is installed, stand-alone ACEs are not required.

8. The 2701 feature code listed is for the attachment of a single synchronous communications line. See the description of the Dual Communication Interface feature in the M 2701 pages for the conditions under which a second synchronous communications line may be attached.

9. When a 3704 or 3705 is equipped with the Remote Program Loader feature (#6260), it may serve as a "Remote" and communicate with a "Local" 3704/3705. The primary communications link between them must be a non-switched facility. A secondary (alternate path) link may be employed, and may be either switched or non-switched. Therefore, communications between a 3704/3705 "Remote" and a 3704/3705 "Local" over this Facility is allowed only as a secondary (alternate path) link.

10. Feature code #4761 on the 3704 and 3705 provides one 2400 bps Integrated Modem for use on the Public Switched Telephone Network. Feature code #4771 on the 3704 and #4707 on the 3705 provide one 2400 bps Integrated Modem with an Automatic Call Originate feature for automatic dialing and communications over the Public Switched Telephone network.

11. The 2400 bps Integrated Modem is included as part of the basic 3669.

12. 3791 switched network operation is supported at the 3704/3705 by non-switched programming. Special procedures are required to establish and disconnect the links. Refer to the VTAM and 3790 operation instructions for the appropriate procedures.

13. Satisfactory data transmission cannot be achieved with all switched network voice services, specifically with those on which proper conditioning of the local loop is not available. For example, off-premise PBX extensions, tandem tie line networks, foreign exchange lines and WATS lines may present characteristics which are not suitable for data transmission. It is recommended that the installation of such a communications system be carefully planned with the common carrier.

14. The 4800 bps Integrated Modem (#5710) is line compatible and suitable for communications over this Facility with an IBM 3874 Modem equipped with feature code #7941, #7951 or #7952.

15. The 3767 terminal will communicate at 300 bps over this Facility with a 3115, 3125, 3704 or 3705. The speed specifies for this type operation are:
   - #9739 on the 3115 and 3125
   - #9612 on the 3704 and 3705
   - #9540 on the 3767.

16. No special feature is required to attach to this facility. Modems must satisfy EIA-RS-232C recommendations. The 3845 and 3846 will operate with DTEs operating at speeds of 110 bps or greater.

17. Feature #9110 required for BSC operation. Feature #9155 required for BSC with Business Machine Clock. The 3845 and 3846 will not operate with NRZI coded facilities.

18. The 3684 does not support 2000 bps operation.

19. Specify Codes #967X, #968X and #969X on the 4331 stipulate which protocol the 4331 is to communicate in, and which line position on the 4331 that protocol is to be applied to, with the "X" in each case being the line position.
### CHART D

**COMMON CARRIER PRIVATE LINE (NON-SWITCHED) SUB-VOICE OR VOICE GRADE CHANNELS**

#### FACILITY D1 - Point-to-point or Multipoint Start-stop Operation @ 134.5 bps or 300 bps on a Half-duplex Type 3002 (or equivalent) Channel.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>3115</th>
<th>3704</th>
<th>3845</th>
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<tbody>
<tr>
<td>2740</td>
<td>2741</td>
<td>3125</td>
<td>3705</td>
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<tr>
<td>Shared Line Adapter</td>
<td>4641</td>
<td>4641</td>
<td></td>
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<tr>
<td>TY 1A (Half-duplex) (1)</td>
<td>thru</td>
<td>thru</td>
<td></td>
</tr>
<tr>
<td>4644</td>
<td>4644</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared Line Adapter</td>
<td>4691</td>
<td>4691</td>
<td></td>
</tr>
<tr>
<td>TY 1B (Duplex) (1)</td>
<td>thru</td>
<td>thru</td>
<td></td>
</tr>
<tr>
<td>4694</td>
<td>4694</td>
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<tr>
<td>Leased Line Adapter</td>
<td>4639</td>
<td>4639</td>
<td></td>
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<tr>
<td>TY 1A (Half-duplex) (1)</td>
<td>4743</td>
<td>4742</td>
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<tr>
<td>(2)</td>
<td>9606</td>
<td>9652</td>
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<tr>
<td>Leased Line Adapter</td>
<td>4647</td>
<td>4647</td>
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<tr>
<td>TY 1B (Duplex) (1)</td>
<td>4743</td>
<td>4742</td>
<td>4742</td>
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<tr>
<td>(2)</td>
<td>9606</td>
<td>9651</td>
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<tr>
<td>Leased Line Adapter</td>
<td>4639</td>
<td>4781</td>
<td></td>
</tr>
<tr>
<td>Ty 1A (Half-duplex) (1)</td>
<td>4781</td>
<td>7111</td>
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<tr>
<td>(2)</td>
<td>9739</td>
<td>9540</td>
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<tr>
<td>1200 bps Integrated Modem (@ 300 bps) (1)</td>
<td>1231</td>
<td>9612</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td>9739</td>
<td>9540</td>
<td></td>
</tr>
<tr>
<td>1200 bps Integrated Modem w/ Interrupt (300 bps) (1)</td>
<td>4785</td>
<td>7113</td>
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<td>1200 bps Integrated Modem w/ Interrupt (300 bps) (1)</td>
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<td>9540</td>
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<td>1200 bps Integrated Modem w/ Interrupt (300 bps) (1)</td>
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#### FACILITY D1M - Point-to-point or Multipoint Start-stop Operation @ 134.5 bps or 300 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
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<td>2702</td>
<td>2703</td>
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<tr>
<td>Interface to Tele-</td>
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<td>4615</td>
<td>4696</td>
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<td>phone Co. Type 1006</td>
<td>9581</td>
<td>9684</td>
<td>4678</td>
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<tr>
<td>Sub-voice Grade</td>
<td>3233</td>
<td>3205</td>
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<td>Service (3)</td>
<td>(5)</td>
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<td></td>
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<tr>
<td>Interface to West-</td>
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<td>4640</td>
<td>4615</td>
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<td>ern Union Type 1006</td>
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<td>Sub-voice Grade</td>
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<td>3205</td>
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<tr>
<td>Service (3)</td>
<td>(5)</td>
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<tr>
<td>Interface to a</td>
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<td>4640</td>
<td>4615</td>
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<td>Stand-alone DCE on a Voice Grade</td>
<td>9581</td>
<td>9684</td>
<td>4678</td>
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<tr>
<td>Channel</td>
<td>3233</td>
<td>3205</td>
<td>9120</td>
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<td>(5)</td>
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<td>or</td>
<td>9606</td>
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<tr>
<td>1200 bps Integrated Modem, Start-stop (300 bps) (1)</td>
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<td>7112</td>
<td>1601</td>
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<tr>
<td>1200 bps Integrated Modem, Start-stop (300 bps) (1)</td>
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<td>9607</td>
<td>9541</td>
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<tr>
<td>1200 bps Integrated Modem, Start-stop (300 bps) (1)</td>
<td>9739</td>
<td>5500</td>
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#### FACILITY D2 - Point-to-point or Multipoint Start-stop or Synchronous Operation @ 600 bps on a Half-duplex or Duplex Type 3002 (or equivalent) Channel.

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<th>IBM Machine Type</th>
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<td>1034</td>
<td>3115</td>
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<td>2740</td>
<td>3846</td>
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<td>3125</td>
<td>4331</td>
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<td>3767</td>
<td>8140</td>
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<td>Leased Line Adapter</td>
<td>4639</td>
</tr>
<tr>
<td>TY 1A, Start-stop</td>
<td>(2)</td>
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<tr>
<td>(Half-duplex) (1)</td>
<td></td>
</tr>
<tr>
<td>Leased Line Adapter</td>
<td>4647</td>
</tr>
<tr>
<td>TY 1B, Start-stop</td>
<td>(2)</td>
</tr>
<tr>
<td>(Duplex) (1)</td>
<td></td>
</tr>
<tr>
<td>1200 bps Integrated Modem, Start-stop (1)</td>
<td>4781</td>
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<tr>
<td>1200 bps Integrated Modem, Synchronous (1)</td>
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<tr>
<td>1200 bps Integrated Modem, Synchronous (1)</td>
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<tr>
<td>1200 bps Integrated Modem, Synchronous (1)</td>
<td>9739</td>
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**FACILITY D2M** - Point-to-point or Multipoint Start-stop or Synchronous Operation @ 600 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

<table>
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<tr>
<th>IBM Machine Type</th>
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<th>3115</th>
<th>3150</th>
<th>3185</th>
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<tr>
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<td>4640</td>
<td>4616</td>
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<td>7106</td>
<td>9739</td>
<td>4640</td>
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<td>4711</td>
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<td>Stand-alone DCE</td>
<td>9852</td>
<td>9825</td>
<td>9121</td>
<td>9601</td>
<td>9721</td>
<td>9541</td>
<td>9646</td>
<td>9701</td>
<td>9701</td>
<td>9701</td>
</tr>
<tr>
<td>for Start-stop</td>
<td>4615</td>
<td>4697</td>
<td>9470</td>
<td>9721</td>
<td>9605</td>
<td>9607</td>
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<td>Operation (1)</td>
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<td>Synchronous</td>
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**FACILITY D3** - Point-to-point or Multipoint Start-stop or Synchronous Operation @ 1200 bps on a Half-duplex or Duplex Type 3002 (or equivalent) Channel.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>3601</th>
<th>3276</th>
<th>3602</th>
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<tbody>
<tr>
<td>Interface to</td>
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<td></td>
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<tr>
<td>Stand-alone DCE</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>for Synchronous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation (1)</td>
<td></td>
<td></td>
<td></td>
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**FACILITY D3M** - Point-to-point or Multipoint Synchronous Operation @ 1200 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

<table>
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<tr>
<th>IBM Machine Type</th>
<th>3715</th>
<th>3115</th>
<th>3271</th>
<th>3275</th>
<th>3275</th>
<th>3275</th>
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<tbody>
<tr>
<td>Interface to</td>
<td>7698</td>
<td>7705</td>
<td>7705</td>
<td>7141</td>
<td>4840</td>
<td>4840</td>
<td>7820</td>
<td>7820</td>
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<tr>
<td>Stand-alone DCE</td>
<td>7692</td>
<td>7710</td>
<td>7710</td>
<td>7710</td>
<td>9649</td>
<td>9649</td>
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<tr>
<td>for Synchronous</td>
<td>(2)</td>
<td>(7)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
<td>(2)</td>
</tr>
<tr>
<td>Operation (1)</td>
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</table>

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**FACILITY D3SB** — Point-to-point or Multipoint Synchronous Operation @ 1200 bps on a Type 3002 (or equivalent) Channel with Back-up on the Public Switched Telephone Network @ 1200 bps or 600 bps.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>3276</th>
<th>3278</th>
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</thead>
<tbody>
<tr>
<td>M1-4</td>
<td>M1-4</td>
<td>M1-4</td>
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</table>

1200 bps Integrated Modem (1)

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>11-14 4331</th>
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<tbody>
<tr>
<td>5507</td>
<td>1601</td>
</tr>
<tr>
<td>9651</td>
<td>4696</td>
</tr>
<tr>
<td>9652</td>
<td>4787</td>
</tr>
<tr>
<td>(16) 4788,</td>
<td>967X</td>
</tr>
<tr>
<td>or 969X</td>
<td>(31)</td>
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**FACILITY D4** - Point-to-point or Multipoint Synchronous Operation @ 2400 bps on a Half-duplex or Duplex Type 3002 (or equivalent) channel.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>2715</th>
<th>3271 M11</th>
<th>3274 M12</th>
<th>3275 M1-4</th>
<th>3278 M1-4</th>
<th>3276 M1-4</th>
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<td>2400 bps Integrated Modem, Pt-to-pt (11)</td>
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<td>3701</td>
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<tr>
<td>2400 bps Integrated Modem, Multipoint (11)</td>
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<tr>
<td>2400 bps Integrated Modem, Multipoint (16)</td>
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**FACILITY D8**

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<th>3651 M50</th>
<th>3651 M75</th>
<th>3659 3684</th>
<th>3704 3705</th>
<th>3735 3737</th>
<th>3767 3771 M1-2</th>
<th>3777 3771 M1-3</th>
<th>3791 3842 3846</th>
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<td>2400 bps Integrated Modem, Pt-to-pt (11)</td>
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<tr>
<td>2400 bps Integrated Modem, Multipoint (11)</td>
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<tr>
<td>2400 bps Integrated Modem, Multipoint (16)</td>
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**FACILITY D10**

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<th>3659 3684</th>
<th>3704 3705</th>
<th>3735 3737</th>
<th>3767 3771 M1-2</th>
<th>3777 3771 M1-3</th>
<th>3791 3842 3846</th>
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<tbody>
<tr>
<td>2400 bps Integrated Modem, Pt-to-pt (11)</td>
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<td>17</td>
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<td>2400 bps Integrated Modem, Multipoint (11)</td>
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<td>2400 bps Integrated Modem, Multipoint (16)</td>
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### FACILITY D4M - Point-to-point or Multipoint Synchronous Operation @ 2000 or 2400 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

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<th>IBM Machine Type</th>
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<th>2703</th>
<th>M2</th>
<th>3115</th>
<th>3125</th>
<th>3135</th>
<th>M1,2</th>
<th>12</th>
<th>M1C</th>
<th>M2</th>
<th>M12</th>
<th>11-14</th>
<th>3602</th>
<th>M2</th>
<th>3624</th>
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<tr>
<td>Interface to</td>
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<td>7710</td>
<td>(6)</td>
<td>7151</td>
<td>7131</td>
<td>4640</td>
<td>(6)</td>
<td>9821</td>
<td>(6)</td>
<td>9821</td>
<td>4502</td>
<td>6352</td>
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<td>Stand-alone DCE</td>
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<td>9609</td>
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<td>(16)</td>
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<td>(21)</td>
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<td>9491</td>
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<td>or</td>
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### FACILITY D4SB - Point-to-point or Multipoint Synchronous Operation @ 2400 bps on a Type 3002 Channel (or equivalent) with Back-up @ 2400 bps or 1200 bps on the Public Switched Telephone Network.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>2701</th>
<th>2703</th>
<th>3115</th>
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<th>M1,2</th>
<th>12</th>
<th>M1C</th>
<th>M2</th>
<th>M12</th>
<th>11-14</th>
<th>3632</th>
<th>3684</th>
<th>3875</th>
<th>3735</th>
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</thead>
<tbody>
<tr>
<td>Interface to</td>
<td>7698</td>
<td>7710</td>
<td>7151</td>
<td>7131</td>
<td>(6)</td>
<td>(6)</td>
<td>9821</td>
<td>(6)</td>
<td></td>
<td>4502</td>
<td>9121</td>
<td>3701</td>
<td>4714</td>
<td>5010</td>
</tr>
<tr>
<td>Stand-alone DCE</td>
<td>(7)</td>
<td>(5)</td>
<td>(2)</td>
<td>9758</td>
<td>16</td>
<td>6302</td>
<td>(16)</td>
<td>8302</td>
<td>or</td>
<td>3701</td>
<td>1602</td>
<td>3701</td>
<td>1604</td>
<td></td>
</tr>
<tr>
<td>for Synchronous</td>
<td>or</td>
<td>(33)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9822</td>
<td></td>
<td></td>
<td>9491</td>
<td>6302</td>
<td>9122</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td></td>
<td></td>
<td>7151</td>
<td>(16)</td>
<td></td>
<td></td>
<td>9822</td>
<td>3701</td>
<td>(16)</td>
<td></td>
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<td></td>
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<td>or</td>
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### FACILITY D5 - Point-to-point or Multipoint Synchronous Operation @ 4800 bps on a Duplex Type 3002 Channel (or equivalent) (C1 conditioning required for the IBM 3874 Modem).

<table>
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<th>IBM Machine Type</th>
<th>2701</th>
<th>2703</th>
<th>3115</th>
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<th>3135</th>
<th>3138</th>
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<th>12</th>
<th>M1C</th>
<th>M2</th>
<th>M12</th>
<th>11-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface to</td>
<td>7698</td>
<td>7710</td>
<td>7151</td>
<td>7131</td>
<td>4640</td>
<td>4640</td>
<td>7821</td>
<td>(6)</td>
<td>3701</td>
<td>7821</td>
<td>(6)</td>
<td>3701</td>
</tr>
<tr>
<td>3874 Modem (9)</td>
<td>(7)</td>
<td>(5)</td>
<td>(2)</td>
<td>9758</td>
<td>9609</td>
<td>9649</td>
<td>16</td>
<td>6302</td>
<td>16</td>
<td>6302</td>
<td>3701</td>
<td></td>
</tr>
<tr>
<td>or</td>
<td>9649</td>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBM 3864 Modem</td>
<td>7151</td>
<td>(2)</td>
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### FACILITY D5M - Point-to-point or Multipoint Synchronous Operation @ 4800 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

<table>
<thead>
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<th>IBM Machine Type</th>
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<th>2717</th>
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<td>2703</td>
<td>2704</td>
<td>2705</td>
<td>2706</td>
<td>2707</td>
<td>2708</td>
<td>2709</td>
<td>2710</td>
<td>2711</td>
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<td>Stand-alone DCE</td>
</tr>
<tr>
<td>Stand-alone DCE</td>
<td>7868</td>
<td>7710</td>
<td>7769</td>
<td>7810</td>
<td>7869</td>
<td>7870</td>
<td>7871</td>
<td>7872</td>
<td>7873</td>
<td>7874</td>
<td>7875</td>
<td>7876</td>
<td>(cont'd)</td>
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<tr>
<td>IBM Machine Type</td>
<td>3601</td>
<td>3602</td>
<td>3603</td>
<td>3604</td>
<td>3605</td>
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<td>3609</td>
<td>3610</td>
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<tr>
<td>Interface to</td>
<td>3601</td>
<td>3602</td>
<td>3603</td>
<td>3604</td>
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<td>3610</td>
<td>3611</td>
<td>3612</td>
<td>Stand-alone DCE</td>
</tr>
<tr>
<td>Stand-alone DCE</td>
<td>4502</td>
<td>4503</td>
<td>4504</td>
<td>4505</td>
<td>4506</td>
<td>4507</td>
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<td>4509</td>
<td>4510</td>
<td>4511</td>
<td>4512</td>
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</table>

### FACILITY D5SB - Point-to-point or Multipoint Synchronous Operation @ 4800 bps on a Duplex Type 3002 Channel (or equivalent) (C1 conditioning required for the IBM 3874 Modem) with Back-up @ 4800 bps or 2400 bps on the Public Switched Telephone Network.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>3271</th>
<th>3272</th>
<th>3273</th>
<th>3274</th>
<th>3275</th>
<th>3276</th>
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</thead>
<tbody>
<tr>
<td>Interface to</td>
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<td>2702</td>
<td>2703</td>
<td>2704</td>
<td>2705</td>
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<td>7710</td>
<td>7769</td>
<td>7810</td>
<td>7869</td>
<td>7870</td>
<td>(cont'd)</td>
</tr>
<tr>
<td>IBM Machine Type</td>
<td>3601</td>
<td>3602</td>
<td>3603</td>
<td>3604</td>
<td>3605</td>
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</tr>
<tr>
<td>Interface to</td>
<td>3601</td>
<td>3602</td>
<td>3603</td>
<td>3604</td>
<td>3605</td>
<td>3606</td>
<td>Stand-alone DCE</td>
</tr>
<tr>
<td>Stand-alone DCE</td>
<td>4502</td>
<td>4503</td>
<td>4504</td>
<td>4505</td>
<td>4506</td>
<td>4507</td>
<td></td>
</tr>
</tbody>
</table>

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### FACILITY D6 - Point-to-point or Multipoint Synchronous Operation @ 7200 bps on a Duplex Type 3002 with C2 Conditioning (or equivalent) Channel.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>2701</th>
<th>3115</th>
<th>3125</th>
<th>3135</th>
<th>3138</th>
<th>11-14</th>
<th>3601</th>
<th>3631</th>
<th>3704</th>
<th>3777</th>
<th>3777</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface to IBM</td>
<td>7698</td>
<td>7151</td>
<td>7131</td>
<td>4640</td>
<td>4640</td>
<td>7281</td>
<td>7821</td>
<td>7821</td>
<td>7821</td>
<td>7821</td>
<td>7821</td>
</tr>
<tr>
<td>Stand-alone DCE</td>
<td>(7)</td>
<td>(2)</td>
<td>9759</td>
<td>9609</td>
<td>9649</td>
<td>6302</td>
<td>9624</td>
<td>9624</td>
<td>9624</td>
<td>9624</td>
<td>9624</td>
</tr>
<tr>
<td>or</td>
<td>9649</td>
<td>(2)</td>
<td>7151</td>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>or</td>
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</tr>
</tbody>
</table>

### FACILITY D6M - Point-to-point or Multipoint Synchronous Operation @ 7200 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>2701</th>
<th>3115</th>
<th>3125</th>
<th>3135</th>
<th>3138</th>
<th>11-14</th>
<th>3601</th>
<th>3631</th>
<th>3704</th>
<th>3777</th>
<th>3777</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface to IBM</td>
<td>7698</td>
<td>7151</td>
<td>7131</td>
<td>4640</td>
<td>4640</td>
<td>7281</td>
<td>7821</td>
<td>7821</td>
<td>7821</td>
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<tr>
<td>Stand-alone DCE</td>
<td>(7)</td>
<td>(2)</td>
<td>9759</td>
<td>9609</td>
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<td>9624</td>
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<td>9624</td>
</tr>
<tr>
<td>or</td>
<td>9649</td>
<td>(2)</td>
<td>7151</td>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>or</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### FACILITY D6SB - Point-to-point or Multipoint Synchronous Operation @ 7200 bps on a Duplex Type 3002 with C2 Conditioning (or equivalent) Channel with Back-up @ 3600 bps on the Public Switched Telephone Network.

<table>
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<th>IBM Machine Type</th>
<th>2701</th>
<th>3115</th>
<th>3125</th>
<th>3135</th>
<th>3138</th>
<th>11-14</th>
<th>3601</th>
<th>3631</th>
<th>3704</th>
<th>3777</th>
<th>3777</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface to IBM</td>
<td>7698</td>
<td>7151</td>
<td>7131</td>
<td>7821</td>
<td>3071</td>
<td>3701</td>
<td>3701</td>
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<td>1461</td>
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<td>(7)</td>
<td>(2)</td>
<td>9759</td>
<td>6302</td>
<td>6302</td>
<td>6302</td>
<td>4502</td>
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<td>4941</td>
<td>9402</td>
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<tr>
<td>or</td>
<td></td>
<td></td>
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<td>9491</td>
<td>9491</td>
<td>9491</td>
<td>1481</td>
<td>9126</td>
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</tr>
<tr>
<td>or</td>
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<td></td>
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<td></td>
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</table>

### FACILITY D7 - Point-to-point or Multipoint Synchronous Operation @ 9600 bps on a duplex Type 3002 Channel (or equivalent).

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>2701</th>
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<th>3125</th>
<th>3135</th>
<th>3138</th>
<th>3071</th>
<th>3601</th>
<th>3631</th>
<th>3704</th>
<th>3777</th>
<th>3777</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface to IBM</td>
<td>6302</td>
<td>6302</td>
<td>6302</td>
<td>6302</td>
<td>6302</td>
<td>3701</td>
<td>3701</td>
<td>3701</td>
<td>3701</td>
<td>3701</td>
<td>3701</td>
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<tr>
<td>Stand-alone DCE</td>
<td>(6)</td>
<td>(10)</td>
<td>(12)</td>
<td>(16)</td>
<td>(16)</td>
<td>3701</td>
<td>3701</td>
<td>3701</td>
<td>3701</td>
<td>3701</td>
<td>3701</td>
</tr>
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<td>or</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>9825</td>
<td>9825</td>
<td>9825</td>
<td>9825</td>
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<td>or</td>
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<td>2711</td>
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FACILITY D7M - Point-to-point or Multipoint Synchronous Operation @ 9600 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy.

<table>
<thead>
<tr>
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<th>3274</th>
<th>3275</th>
<th>3276</th>
<th>3776</th>
<th>3777</th>
<th>3845</th>
<th>8101</th>
<th>8775</th>
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</thead>
<tbody>
<tr>
<td>M1,</td>
<td>M1,</td>
<td>M1,</td>
<td>M1,</td>
<td>M3.4</td>
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<tr>
<td>IBM Machine Type</td>
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<td>14</td>
<td>14</td>
<td>3602</td>
<td>3632</td>
<td>3705</td>
<td>M3.2</td>
</tr>
<tr>
<td>Interface to Stand-alone DCE</td>
<td>(6, 16)</td>
<td>(6, 16)</td>
<td>(16)</td>
<td>(16)</td>
<td>3602</td>
<td>3602</td>
<td>4502</td>
<td>or</td>
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<tr>
<td>Notes for Chart D</td>
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<td></td>
</tr>
</tbody>
</table>

1. IBM Line Adapters and Integrated modems perform the modulation/demodulation function on communications at speeds up to 4800 bps. When they are used, stand-alone DCEs are not required. SRL GA24-345S is your best source of information on the IBM Line Adapters and Integrated Modems.

2. The 3115, 3125 and 3135 feature codes listed are for the attachment of the first communication line. See the M 3115, M 3125, 3135 and pages for additional line attachment feature codes.

3. When used on a Voice Grade Channel, #9120 on the 2740 will operate in a point-to-point mode only. The 2741 terminal will operate in a point-to-point mode on any facility.

4. The 2703 line feature codes (#205, #7710) are for the attachment of up to eight start-stop or up to four synchronous communications lines. See the M 2703 pages for additional line attachment feature codes.

5. No special feature code is required to attach this DTE to this Facility.

6. The listed feature codes are for the attachment of a single synchronous communications line. See the description of the Dual Communication Interface feature in the M 2701 and M 2715 pages for the condition under which a second synchronous communications line may be attached.

7. Refer to the M 3672, 3874 and 3875 pages for the DTE attachment feature codes required for each attaching DTE.

8. The 2704/3705 "Remotes" may communicate with 3704/3705 "Locals", point-to-point only, over this facility as their primary communications link. Feature codes #4714, #4751 and #4781 will support data-half-duplex operation over half-duplex or duplex communications facilities. Feature codes #4718, #4754 and #4784 will support data-full-duplex operation (i.e., simultaneous data transmission in both directions) over duplex facilities only.

9. The 2400 bps Integrated Modem and the IBM 3659 Remote Communications Unit are line compatible and suitable for communications with the IBM 3872 modem, properly equipped. - #4714 or #5700 Integrated Modems require that the 3872 be equipped with #6101 or #6102. - #5702 Integrated Modems are compatible with the basic (control station) 3872. The 3659 mdl 1 requires that the 3872 be equipped with #6101 or #6102. The 3659 mdl 2 requires that the 3872 be a basic control station (no special features) or equipped with #6302.

10. The 3659, 3874 and 3875 Modems must be equipped with #7951 or #7952 to operate on a switched network back-up link, except that the control station may operate over this type of line via separate ports, each of which is equipped with a 3872, 3874 or 3875 Modem.

11. The 3604 (when equipped with #8001 or #8002), 3614 and 3624 (when equipped with #8001) and the 3603 will communicate with a 3601 or 3602 equipped with #8001 over a normal 3600 System "loop." When more than one 3603, 3604, 3614 or 3624 is on the loop, half-duplex, point-to-point, 2-wire terminated lines are required from the 3601 or 3602 to the first station on the loop, between successive stations on the loop and from the last station on the loop back to the 3601 or 3602. When only one station is on the loop, a duplex, point-to-point, 4-wire terminated line is required between it and the 3601 or 3602. The 3601, 3602, 3614 and 3624, when equipped with #5500, will communicate with a 3704 or 3705 over non-switched voice grade lines either point-to-point or multipoint. See Note 16 following.

12. The 3614 and 3624 mdl 1C, 3275 mdl 12, 3276, 3601, 3602, 3614, 3624, 3631, 3632, 3651 mdl 50, 3677, 3771, 3773, 3774, 3775, 3776, 3777, 3791, 5320, 5340, 3845 and Series/1 will communicate as tributary stations in a multipoint network with a control station 3704 or 3705 using Synchronous Data Link Control (SDL). SDLC allows the control station to receive from one tributary station while it is transmitting to another tributary station. Operation in this mode requires that the 3704/3705 be equipped with one of the following:
- #4784 for communications with a tributary station equipped with a 1200 bps Integrated Modem, or
- #5745 for communications with a tributary station equipped with a 2400 bps Integrated Modem or attaching an IBM 3872 modem, or
- #4718 for communications with a tributary station via stand-alone DCEs. Duplex communications facilities are required for this mode of operation. SDL also supports the normal data-half-duplex mode of operation over half-duplex or duplex communications facilities.

13. The 3651 Model 50 will communicate over this Facility with a 3704 or 3705 at the host System/370, or with a 3659 at a remote store site. Communications with the 3704/3705 requires #5121 or #5122. Communications with the 3659 requires #6111. The 3659 at the remote store site includes a 2400 bps Integrated Modem as part of the basic unit. Point-to-point remote communications loop requires the 3659 mdl 1. Multipoint remote communications loop requires the 3659 mdl 2.

14. Leased Line Adapters are available as features on the 3704 or 3705 as noted. However, additional Leased Line Adapters may be attached via the 2711 Line Adapter Unit. The 3704/3705 feature code for each pair of lines so attached is either #4711 or #4714.
19. The 4800 bps Integrated Modem, Point-to-point (#5700), is line compatible and suitable for communications with an IBM 3874 Modem equipped with the Point-to-point feature (#6101). The 4800 bps Integrated Modem, Multipoint (#5702), is line compatible and suitable for communications with an IBM 3874 Modem equipped with the Multipoint Control feature (#5100).

20. The 3767 terminal will communicate over this Facility at 300 bps with a 3115, 3125, 3135, 3138, 3704 or 3705. The speed specifies for this operation are:
   - #9739 on the 3115 and 3125
   - #9593 on the 3135
   - #9612 on the 3704 and 3705
   - #9540 on the 3767.
   - None on the 3138 where the speed is customer selectable.

21. The 3603 mdl 1 includes a 1200 bps Integrated Modem which is line compatible and suitable for communications with the 3601’s or 3602’s 1200 bps Loop Integrated Modem (#8001). The 3603 mdl 2 can provide an EIA/CCITT interface between a modem and a subloop of terminals or between a modem and a 3600 system controller. Special feature #6352 provides transmit signal element timing to a synchronous modem.

22. The 3777 mdl 2 operates in point-to-point mode only.

23. Features #4751 and #4754 on the 3705 require an RPQ.

24. Features #5600 and #5602 on the 3735 require an RPQ.

25. Features #5600 and #5602 on the 3780 require an RPQ.

26. Communication over this facility is between a 3276 operating as a multipoint or point-to-point tributary station and the 3791 (with #3210 and/or #3211 and/or #3703 and/or #4781) operating as a multipoint control station.

27. No special feature is required to attach to this facility. Modems must satisfy EIA-RS-232C recommendations. The 3845 and 3846 will operate with DTEs operating at speeds of 110 bps or greater.

28. Feature #9110 required for BSC operation. Feature #9115 required for BSC with Business Machine Clock. The 3845 and 3846 will not operate with NRZI coded facilities.

29. The 3276 may be attached as a tributary station on a multipoint non-switched line where the control station is a 3791 equipped with a Data Link Adapter (#3210 or #3211). All stations on such a line must operate at the same speed and use the same type clocking source, i.e., either modem or business machine clocking.

30. The 3684 does not support 2,000 bps operation.

31. Specify Codes #967X, #968X and #969X on the 4331 stipulate which protocol the 4331 is to communicate in, and which line position on the 4331 that protocol is to be applied to, with the "X" in each case being the line position.

32. The 3705 using #4718 can communicate in duplex data communication mode (i.e., data transmission in both directions simultaneously) with the 3776-3, 3777-3 over duplex communications facilities.

33. To operate on these switched network back-up facilities, the IBM 3863, 3864 and 3865 Modems must be equipped with feature #7953.

34. The IBM 3865 Modem will generally operate satisfactorily on a common carrier supplied unconditioned type 3002 non-switched voice band channel (or equivalent). However, in some cases the 3865 mdl 1 modem may require D1 conditioning on the channel and the 3865 mdl 2 modem may require either C1 or D2 conditioning on the channel. See M 3865 pages for details.
### CHART E

**COMMON CARRIER PRIVATE LINE (NON-SWITCHED) WIDEBAND CHANNELS**

#### FACILITY E1 - Point-to-point Synchronous Operation @ 19.2 Kbps on a Wideband Channel.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to Type</th>
<th>5703 Service</th>
<th>Interface to Type</th>
<th>8803 Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3776 M3,4</td>
<td>3777</td>
<td>1481</td>
<td>3777 M1.2</td>
<td></td>
</tr>
<tr>
<td>3115</td>
<td>7697,7121</td>
<td>4717</td>
<td>7697</td>
<td></td>
</tr>
<tr>
<td>3115</td>
<td>(2)</td>
<td>(3)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>2701</td>
<td>3125</td>
<td>4717</td>
<td>7121</td>
<td></td>
</tr>
<tr>
<td>3705</td>
<td>4717</td>
<td>4501</td>
<td>7697</td>
<td></td>
</tr>
<tr>
<td>3705</td>
<td>(4)</td>
<td>(5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### FACILITY E2 - Point-to-point Synchronous Operation @ 40.8 Kbps on a Wideband Channel.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to Type</th>
<th>5701 Service</th>
<th>Interface to Type</th>
<th>8801 Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3776</td>
<td>3777</td>
<td>1481</td>
<td>3777</td>
<td></td>
</tr>
<tr>
<td>3115</td>
<td>7697,3701,3704,3705</td>
<td>4717</td>
<td>7697</td>
<td></td>
</tr>
<tr>
<td>3115</td>
<td>(2)</td>
<td>(3)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>2701</td>
<td>3125</td>
<td>4717</td>
<td>7121</td>
<td></td>
</tr>
<tr>
<td>3705</td>
<td>4717</td>
<td>4501</td>
<td>7697</td>
<td></td>
</tr>
<tr>
<td>3705</td>
<td>(4)</td>
<td>(5)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### FACILITY E3 - Point-to-point Synchronous Operation @ 50 Kbps on a Wideband Channel.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to Type</th>
<th>5701 Service</th>
<th>Interface to Type</th>
<th>8801 Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3776</td>
<td>3777</td>
<td>1481</td>
<td>3777</td>
<td></td>
</tr>
<tr>
<td>3115</td>
<td>7697,3701,3704,3705</td>
<td>4717</td>
<td>7697</td>
<td></td>
</tr>
<tr>
<td>3115</td>
<td>(2)</td>
<td>(3)</td>
<td>(2)</td>
<td></td>
</tr>
<tr>
<td>2701</td>
<td>3125</td>
<td>4717</td>
<td>7121</td>
<td></td>
</tr>
<tr>
<td>3705</td>
<td>4717</td>
<td>4501</td>
<td>7697</td>
<td></td>
</tr>
<tr>
<td>3705</td>
<td>(4)</td>
<td>(5)</td>
<td></td>
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</tr>
</tbody>
</table>

#### FACILITY E4 - Point-to-point Synchronous Operation @ 230.4 Kbps on a Wideband Channel.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to Type</th>
<th>5761 Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3776</td>
<td>3777</td>
<td>1481</td>
</tr>
<tr>
<td>3115</td>
<td>7697,3701,3704,3705</td>
<td>4717</td>
</tr>
<tr>
<td>3115</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>2701</td>
<td>3125</td>
<td>4722</td>
</tr>
<tr>
<td>3705</td>
<td>4722</td>
<td>(4)</td>
</tr>
</tbody>
</table>

### NOTES FOR CHART E

2. This feature code is for the attachment of a single synchronous communications line. See the Dual Communications Interface feature description in the M 2701 pages for the conditions under which a second synchronous communications line may be attached.

3. A communications line attached to the ICA via this feature will present a 100% load factor to the ICA, and must not be operated simultaneously with any other line on the ICA.

4. 3704/3705 "Remotes" may communicate over this facility with 3704/3705 "Locals" point-to-point only as their primary communications link. #4717 or #4722 will support data half-duplex operation over half-duplex facilities, while #4725 or #4723 will support data full-duplex (i.e., simultaneous data transmission in both directions) over duplex facilities.

5. The 3705 using #4725 can communicate in duplex data communication mode (i.e., data transmission in both directions simultaneously) with the 3776-3,4, 3777-3 over duplex communications facilities.
DP Machines

CHART G
CUSTOMER OWNED AND MAINTAINED (COAM) LIMITED DISTANCE FACILITIES

FACILITY G1 - Point-to-point or Multipoint Start-stop Operation @ 134.5 bps on a Customer Owned and Maintained Line up to 4.75 wire miles in length.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>2702</th>
<th>2703</th>
<th>2740</th>
<th>2741</th>
<th>3705</th>
<th>3846</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited Distance</td>
<td>4634</td>
<td>4634</td>
<td>4634</td>
<td>4731</td>
<td>(7)</td>
<td></td>
</tr>
<tr>
<td>Line Adapter, Ty</td>
<td>9684</td>
<td>4878</td>
<td>(5)</td>
<td>9606</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1A, Half-duplex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited Distance</td>
<td>4635</td>
<td>4635</td>
<td>4635</td>
<td>4732</td>
<td>(7)</td>
<td></td>
</tr>
<tr>
<td>Line Adapter, Ty</td>
<td>9684</td>
<td>4878</td>
<td>(5)</td>
<td>9606</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1B, Duplex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FACILITY G2 - Point-to-point or Multipoint Start-stop Operation @ 134.5 bps or 600 bps on a Customer Owned and Maintained Line up to 8 wire miles in length.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>1031A</th>
<th>1071</th>
<th>2701</th>
<th>2702</th>
<th>2703</th>
<th>2740</th>
<th>2741</th>
<th>3705</th>
<th>3846</th>
</tr>
</thead>
<tbody>
<tr>
<td>Limited Distance</td>
<td>4792</td>
<td>4636</td>
<td>4612</td>
<td>4688</td>
<td>4790</td>
<td>4790</td>
<td>4741</td>
<td>(7)</td>
<td></td>
</tr>
<tr>
<td>Line Adapter, Ty</td>
<td>9112</td>
<td>9684</td>
<td>4878</td>
<td>(5)</td>
<td>9606</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ 134.5 bps</td>
<td>(3)</td>
<td>(1,3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited Distance</td>
<td>(4)</td>
<td>4792</td>
<td>4637</td>
<td>4613</td>
<td>4688</td>
<td>4790</td>
<td>4741</td>
<td>(7)</td>
<td></td>
</tr>
<tr>
<td>Line Adapter, Ty</td>
<td>9112</td>
<td>9685</td>
<td>4879</td>
<td>(6)</td>
<td>9607</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>@ 600 bps</td>
<td>(3)</td>
<td>(1,3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES FOR CHART G
1. The 2703 feature codes listed are for the attachment of up to eight communications lines. See the M 2703 pages for additional line attachment feature codes.

3. Type 2 Limited Distance Line Adapters are available as features on the 2702, 2703, 3704 and 3705. However, when the maximum number of line adapters is reached on these machines, additional line adapters may be attached via the 2711 Line Adapter Unit. The 2702 feature code required for each line so attached is #3233. The 2703 feature code required for each group of up to eight lines so attached is #3205 or #3206. The 3704 and 3705 feature code required for each pair of lines so attached is #4711 or #4714.

4. The Limited Distance Line Adapter, Type 2, is included as part of the basic 1031A, unless the IBM Line Adapter, #4647, is ordered.

5. This DTE will operate on this Facility in point-to-point mode only.

6. This entry applies to the 2740 Model 2 only.

7. No special feature is required to attach to this facility. Modems must satisfy EIA-RS-232C recommendations. The 3845 and 3846 will operate with DTEs operating at speeds of 110 bps or greater.

---

CHART H
PARALLEL TRANSMISSION

FACILITY H1 - Parallel Transmission @13 cps on the Public Switched Telephone Network or on a Non-switched Voice Grade Line via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>1001</th>
<th>7770</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interface to</td>
<td>(2)</td>
<td>(2)</td>
</tr>
<tr>
<td>Stand-alone DCE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES FOR CHART H
2. No special feature is required to attach this DTE to this Facility.
### COMMON CARRIER PRIVATE LINE (NON-SWITCHED) DIGITAL DATA COMMUNICATION SERVICES

**FACILITY X1** - Point-to-point or Multipoint Synchronous Operation @ 2400 bps.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to AT&amp;T</th>
<th>Data phone * or or or 4695 or or</th>
<th>Digital Data</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3276 3776 M1,4, M3,4</td>
<td>5650 3650 5650 1601 1602 5650</td>
<td>or or or 4695 or or</td>
<td>5651 5651 5651 5650 1604, 5651</td>
<td>6302 6302 9822 967x 5680 9822</td>
</tr>
<tr>
<td>3274 11- 3777 M11, M11,</td>
<td>or or or 4695 or or</td>
<td></td>
<td>9822 9822 (15) or</td>
<td>969X (13)</td>
</tr>
<tr>
<td>8101 8775 8130 8140 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IBM Machine Type</strong></td>
<td><strong>Interface to AT&amp;T</strong></td>
<td><strong>Data phone * or or or 4695 or or</strong></td>
<td><strong>Digital Data</strong></td>
<td><strong>Service</strong></td>
</tr>
<tr>
<td><strong>IBM Machine Type</strong></td>
<td><strong>Interface to AT&amp;T</strong></td>
<td><strong>Data phone * or or or 4695 or or</strong></td>
<td><strong>Digital Data</strong></td>
<td><strong>Service</strong></td>
</tr>
<tr>
<td><strong>IBM Machine Type</strong></td>
<td><strong>Interface to AT&amp;T</strong></td>
<td><strong>Data phone * or or or 4695 or or</strong></td>
<td><strong>Digital Data</strong></td>
<td><strong>Service</strong></td>
</tr>
</tbody>
</table>

**FACILITY X1M** - Point-to-point or Multipoint Synchronous Operation @ 2400 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to AT&amp;T</th>
<th>Data phone * or or or 4695 or or</th>
<th>Digital Data</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3271 3272 M11, M12</td>
<td>7698 7151 7131 4640 4640 (3) (3,5) 3701 (3) (3,5) 3701 4502 3701 4502</td>
<td>or or or 4695 or or</td>
<td>5630 or 6302 or</td>
<td>9491 6302, (5) 6302.</td>
</tr>
<tr>
<td>3275 3276 M12</td>
<td>7151 (4) (4)</td>
<td></td>
<td>9822 3701 (5)</td>
<td>9822 (5) (5)</td>
</tr>
<tr>
<td>3277 3776 M3,4</td>
<td>7777 3777</td>
<td></td>
<td>3791 3845</td>
<td>8101 8775 8130 M11, 12</td>
</tr>
<tr>
<td><strong>IBM Machine Type</strong></td>
<td><strong>Interface to AT&amp;T</strong></td>
<td><strong>Data phone * or or or 4695 or or</strong></td>
<td><strong>Digital Data</strong></td>
<td><strong>Service</strong></td>
</tr>
<tr>
<td><strong>IBM Machine Type</strong></td>
<td><strong>Interface to AT&amp;T</strong></td>
<td><strong>Data phone * or or or 4695 or or</strong></td>
<td><strong>Digital Data</strong></td>
<td><strong>Service</strong></td>
</tr>
</tbody>
</table>

**FACILITY X2** - Point-to-point or Multipoint Synchronous Operation @ 4800 bps.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to AT&amp;T</th>
<th>Data phone * or or or 4695 or or</th>
<th>Digital Data</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3274 3275 3276 M1,4, M3,4</td>
<td>5650 5650 5650 1601 1602 5650</td>
<td>or or or 4695 or or</td>
<td>5651 5630 5651 5650 1604, 5651</td>
<td>6302 9823 9823 967x 5660 9823</td>
</tr>
<tr>
<td>3277 3776</td>
<td></td>
<td></td>
<td>9823 (5) (15) or</td>
<td>969X</td>
</tr>
<tr>
<td>3278 3779</td>
<td></td>
<td></td>
<td>3211 (13) 3703 (9)</td>
<td></td>
</tr>
</tbody>
</table>

**FACILITY X2M** - Point-to-point or Multipoint Synchronous Operation @ 4800 bps via Stand-alone DCEs attached under the provision of the IBM Multiple Supplier Systems Policy

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>Interface to AT&amp;T</th>
<th>Data phone * or or or 4695 or or</th>
<th>Digital Data</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>3271 3272 3273 M1,2</td>
<td>7698 7151 7131 4640 4640 7821 (3,5) 3701 7821 (3,5) 3701 4502 3701 4502</td>
<td>or or or 4695 or or</td>
<td>6302 or 6302 or</td>
<td>9491 6302, (5) 6302.</td>
</tr>
<tr>
<td>3274 3275 3276 M12</td>
<td>7151 (4) (4)</td>
<td></td>
<td>9823 3701 (5)</td>
<td>9823 (5) (5)</td>
</tr>
<tr>
<td>3277 3776 3777 3778 3779 3845</td>
<td>3791 3845</td>
<td></td>
<td>8101 8775 8130 M11, 12</td>
<td>3864 3632</td>
</tr>
<tr>
<td><strong>IBM Machine Type</strong></td>
<td><strong>Interface to AT&amp;T</strong></td>
<td><strong>Data phone * or or or 4695 or or</strong></td>
<td><strong>Digital Data</strong></td>
<td><strong>Service</strong></td>
</tr>
<tr>
<td><strong>IBM Machine Type</strong></td>
<td><strong>Interface to AT&amp;T</strong></td>
<td><strong>Data phone * or or or 4695 or or</strong></td>
<td><strong>Digital Data</strong></td>
<td><strong>Service</strong></td>
</tr>
</tbody>
</table>

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FACILITY X3 - Point-to-point or Multipoint Synchronous Operation @ 9600 bps.

<table>
<thead>
<tr>
<th>IBM Machine Type</th>
<th>IBM Machine Type</th>
<th>IBM Machine Type</th>
<th>IBM Machine Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>3776</td>
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</tr>
<tr>
<td>3274 M11-</td>
<td>3274 M2,4</td>
<td>3274 M11-</td>
<td>3274 M2,4</td>
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<tr>
<td>3777</td>
<td>3777</td>
<td>3777</td>
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<td>8130 M11</td>
<td>8130 M1,14</td>
<td>8130 M1,1</td>
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</tbody>
</table>

FACILITY X3M - Point-to-point or Multipoint Synchronous Operation @ 9600 bps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy.

FACILITY X4 - Synchronous operation at 56,000 bps on public non-switched data network via integrated DCEs.

FACILITY X4M - Point-to-point Synchronous Operation @ 56 Kbps via Stand-alone DCEs attached under the provisions of the IBM Multiple Supplier Systems Policy.

NOTES FOR CHART X

2. The listed feature codes are for the attachment of a single synchronous communications line. See the description of the Dual Communication Interface feature in the M 2701 pages for the conditions under which a second synchronous communications line may be attached.

3. No special feature is required to attach this DTE to this Facility.

4. The 3115, 3125, 3135 and 3138 feature codes listed are for the attachment of the first communications line. See the M 3115, M 3125 and M 3135 pages for additional line attachment feature codes.

5. The 3271 mdis 11 and 12, 3274 mdi 1C, 3275 mdi 12, 3276, 3601, 3602, 3614, 3624, 3631, 3632, 3767, 3771, 3773, 3774, 3775, 3776, 3777, 3791, 5320, 5340 and Series/1 will communicate as tributary stations in a multipoint network with a control station 3704 or 3705 using Synchronous Data Link Control (SDLC). SDLC allows the control station to receive from one tributary station while it is transmitting to another tributary station. Operation in this mode requires that the 3704/3705 be equipped with feature #4718. SDLC also supports the normal data-half-duplex mode of operation.

6. 3704/3705 "Remotes" may communicate over this Facility with 3704/3705 "Locals" point-to-point only as their primary communications link. Feature code #4714 will support data-half-duplex operation over half-duplex or duplex facilities, while feature code #4718 will support data-full-duplex (i.e., simultaneous data transmission in both directions) over duplex facilities.

8. The 3777 mdi 2 operates in point-to-point mode only.

9. Communication over this facility is between a 3276 operating as a multipoint or point-to-point tributary station and a 3791 (with M11, 3704 or 3705) operating as a multipoint control station.

10. No special feature is required to attach to this facility. Modems must satisfy EIA-RS-232C recommendations. The 3845 and 3846 will operate with DTEs operating at speeds of 110 bps or greater.

11. Feature #9110 required for BSC operation. Feature #9115 required for BSC with Business Machine Clock. The 3845 and 3846 will not operate with NRZI coded facilities.

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12. The 3276 may be attached as a tributary station on a multipoint non-switched line where the control station is a 3791 equipped with a Data Link Adapter (#3211). All stations on such a line must operate at the same speed.

13. Specify Codes #967X, #968X and #969X on the 4331 stipulate which protocol the 4331 is to communicate in, and which line position that protocol is to be applied to, with the "X" in each case being the line position.

14. The 3705 using #4718 can communicate in duplex data communication mode (i.e., data transmission in both directions simultaneously) with the 3776-3,-4, 3777-3 over duplex communications facilities.

15. The 3776-3,-4, 3777-3 can communicate in duplex data communication mode (i.e., data transmission in both directions simultaneously) over duplex communications facilities.
Purpose: A communicating version of the OPD Mag Card "Selectric" to satisfy the need for incidental communications in the power typing environment. May be used to communicate with another like machine or as a terminal.

Highlights: The Mag Card "Selectric" uses a new I/O, a read/write unit and a Mag Card console housing the electronics. The mag card itself consists of 50 tracks of 100 characters each. The line expansion feature permits recording of 20-35 characters beyond the normal writing line of 65-70 characters. All functional controls and code keys for local and communications mode are provided on the keyboard of the "Selectric" I/O. The communications control includes a "Start" key for initiating transmission to a like machine, "Attention" key, a "CPU" key for initiating transmission to a computer, and a "Line Hold" key for maintaining communications when not transmitting or receiving.

Includes character format checking, dual velocity printing, send and receive indicator lights and a choice of a fabric or film ribbon. Print quality is exactly equivalent to that of a Mag Card "Selectric" Typewriter.

Magnetic cards prepared offline on any Mag Card "Selectric" may be transmitted at 135 baud. Sending and receiving may also take place directly from the keyboard.

The Standard Communicating Mag Card "Selectric" Typewriter is functionally equivalent online to a 2741. Communications Terminal equipped with the following features: Dial Up (#3255), Switched Network Attachment (#9114), Receive Interrupt (#4708), Typewriter Keys (#8341) and Transmit Interrupt (#7900).

Code and systems compatibility provide for transmission to or from a suitably equipped S/360 m22 thru 85 and 195, or a S/370 m125 thru 195. See Prerequisites below.

Communications Facilities: The unit operates in half-duplex data, full duplex control mode over Common Carrier Public Switched Facilities (C1) at 134.5 bps.

PREREQUISITES: Communicates with a S/360 m22 thru 85 and 195, or any S/370 Processor except 3115. The data processing system requires a 2701 Data Adapter Unit or a 2702 or 2703 Transmission Control.

Via 2701 The 2701 requires an IBM Terminal Adapter Type I (#4640) and Speed Selection (#9581). Limitation: The Receive and Transmit Interrupt features on this unit will not be recognized when communication is via a 2701.

Via 2702 The 2702 requires IBM Terminal Control Base (#9696), IBM Terminal Control-Type I (#4615), Selective Speed (#4684), and Data Set Line Adapter (#3233). Note: Type I Terminal Interrupt (#8200), when installed on the 2702, will allow the Transmit and Receive Interrupt features of this unit to be recognized. The 2741 Break (#8055) on the 2702 will allow only the Transmit Interrupt feature of this unit to be recognized.

Via 2703 The 2703 requires either Start-Stop Base Type I (#7505) or Type II (#7506), IBM Terminal Control Base (#4619), IBM Terminal Control Type I (#4696), Line Speed Option (#4878), and Data Line Set (#3205). Note: Type I Terminal Interrupt (#8200) will allow the Transmit and Receive Interrupt capability of this unit to be recognized. 2741 Break (#8055) will allow only the Transmit Interrupt feature of this unit to be recognized.

Customer Responsibilities: The customer must be advised that:
[1] He is responsible for making arrangements for price quotations, installation and cost (initial and recurring) of common carrier communications facilities/services ... [2] Toll charges, if required for installation and maintenance of the IBM equipment, are to be paid by the customer ... [3] The customer must be prepared to relinquish the data processing system for service in those cases in which servicing aids or available error message printouts do not permit localization of a malfunction of the communications facility or terminal location.


Specify: [1] Voltage ... 115 VAC, 60 Hz, 15 amps, 3-wire cord only.
[2] Typing Element ... available only in standard correspondence "Selectric" code. One OPD "Selectric" 72 element in correspondence keyboard configuration 101 is furnished with the unit. See #9811 on page 23 in "Type Catalog." Additional elements may be ordered.

Note: The byte structure of the standard "Selectric" character set differs from that for PTTC/BCD or PTTC/EBCD character sets.

[3] Character Spacing ... 10 characters/inch or 12 characters/inch may be specified.

[4] Line Feeding ... 6 lines/inch, unless otherwise specified. Pin feed platen is available on an SER (RPG) basis only.

SPECIAL FEATURES

ACOUSTICAL FILTER HOOD. [Plant or field installable] This feature significantly reduces the amount of noise produced when printing output.

PARAGRAPH INDENT. [Plant or field installable] Designed for a maximum level of efficiency when preparing and revising indented material in the local mode. This feature is inoperative when receiving from a computer.

AUTO TERMINAL ID. [Plant or field installable] The four character identification sequence is permanently assigned by IBM. The plant will assign a different combination of characters to each Mag Card "Selectric" Typewriter equipped with this feature. The first character will specify terminal type and the last three will be assigned to that unit. If field installation of a new number or change to an existing number is desired.

COMMUNICATE MODE KEYLOCK. [Plant or field installable] The Keylock which inhibits the communicate mode will be furnished by IBM. Two keys will be furnished with each lock and additional keys may be purchased.
2701 DATA ADAPTER UNIT

Purpose: Attaches to a S/360 midr 22 thru 85, 195 or any S/370 or 4300 Processor for communications with remote and local I/O devices operating via various customer or common carrier facilities.

Highlights: A modular unit which greatly expands the data communications and data acquisition I/O capabilities of S/360 and S/370. Provides for attachment of up to four half-duplex start/stop communications lines with speeds up to 600 bps ... or up to four (maximum of two operating simultaneously) half-duplex synchronous communications lines with line speeds up to 230,400 bps ... or up to four parallel data acquisition devices (word width -- 16 to 48 bits). Various combinations of the terminal devices are possible with any 2701.

Communications Facilities: The 2701 operates in half-duplex mode for information concerning applicable communications facilities, see M 27020 pages, this section. The alphanumeric communications facility references indicated below correspond to those shown on the charts on those pages.

Terminal Devices: The 2701 can communicate with the following terminal devices and in the modes and speeds indicated ... for further information about the adapters required on the 2701, see "Special Features" below.

START/STOP TERMINALS

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Speed (bps)</th>
<th>Facilities (1)</th>
<th>2701 Adapter Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1030 Systems</td>
<td>600 D2, G2</td>
<td>4640</td>
<td></td>
</tr>
<tr>
<td>1060 Systems</td>
<td>134.5 D1, G2</td>
<td>4640 w 9581</td>
<td></td>
</tr>
<tr>
<td>1070 Systems</td>
<td>134.5 D1, G2</td>
<td>4640 w 9581</td>
<td></td>
</tr>
<tr>
<td>2740 midl 1s, 2741s, or 2742s</td>
<td>134.5 D1, G1, G2</td>
<td>4640 w 9581</td>
<td></td>
</tr>
<tr>
<td>5010 midl As (5)</td>
<td>134.5 C1, C2</td>
<td>4640 w 9581</td>
<td></td>
</tr>
<tr>
<td>2740 midl 2s, or 2742s</td>
<td>134.5 D1, G2</td>
<td>4640 w 9581</td>
<td></td>
</tr>
<tr>
<td>5010 midl As</td>
<td>600 D2, G2</td>
<td>4640 w 9582</td>
<td></td>
</tr>
<tr>
<td>2845/2265s, 2848/2260s</td>
<td>1200 D3</td>
<td>4656</td>
<td></td>
</tr>
<tr>
<td>3767 (as a 2740-2)</td>
<td>600 D2</td>
<td>4640 w 9582</td>
<td></td>
</tr>
<tr>
<td>AT&amp;T 83B2/83Bs</td>
<td>45.1 A5</td>
<td>7860</td>
<td></td>
</tr>
<tr>
<td>WU 115As</td>
<td>56.9 A2</td>
<td>7861</td>
<td></td>
</tr>
<tr>
<td>74.2 A3</td>
<td>7862</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TXW - 33/35s</td>
<td>110.0 C2</td>
<td>7885</td>
<td></td>
</tr>
</tbody>
</table>

FIXED 4-OUT-OF-8 CODE TERMINALS

<table>
<thead>
<tr>
<th>Terminals</th>
<th>Speed (bps)</th>
<th>Facilities (16)</th>
<th>2701 Adptr</th>
<th>Required (15)</th>
<th>Interface</th>
</tr>
</thead>
<tbody>
<tr>
<td>1009,1013,7701,7702, 7710,7711,7740,7741,7760 S/360 midl 20 w 2703, 1130 w 7690</td>
<td>1200 Telephone Network work at 1200 or 2000 bps, Wideband Service</td>
<td>6966 3462</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1009,1013,7702,7710, 7711, 7740 S/360 midl 20 w 2703, 1130 w 7690</td>
<td>2000 band service 19.2 or 40.8 Kbps</td>
<td>6966 3462</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1009,1013,7702,7710, 7711, 7740 S/360 midl 20 w 2703, 1130 w 7690</td>
<td>2400</td>
<td>6966 3462</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PARALLEL DATA SERVICES

For each data path a Parallel Data Adapter (#5500) is required.

| (1) Or equivalent privately owned facility. |
| (2) On appropriate facilities, an IBM Line Adapter (#4636, 4637) may be used in lieu of a data set. |
| (5) Appropriate transmission code, (#9060) for EBCDIC, (#9061) for ASCII or (#9062) for 6-bit Transcode, must be specified. |
| (6) On facilities C4, C5 or C6, Autocall (#1314) can be used. |
| (7) 2000 bps with the 27020. |

† The number and speeds of attachable lines is also a function of the attached processor, the channels assigned, and the characteristics of other devices attached to those channels.

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Customer Responsibilities: See M 2701 pages. The customer is also responsible for furnishing signal levels and impedance matching in accordance with specifications outlined in OEM Manual GA22-6844 for the Parallel Data Adapter (5500) or any of the synchronous or start/stop adapters if he provides the data sets, telegraph terminations, or privately owned communications facilities.

PREREQUISITES: The 2701 requires a control unit position on a system channel.

S/360 mdl 22 — multiplexer channel (standard) ... see 2022.
S/360 mdl 25 — Multiplexer Channel (special feature) ... see 2025.
S/360 mdl 30, 40, 50 — multiplexer channel (standard), or Selector Channels (special features) ... see 2030, 2040, 2050.
S/360 mdl 44 — special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, or Add I High Speed Multiplexer Subchannels ... see 2044.
S/360 mdl 65, 75 — selector channel of 2860, basic multiplexer channel of 2870, or Selector Subchannels (special features) on 2870 ... see 2860, 2870.
S/360 mdl 67 — selector channel of 2860, or basic multiplexer channel of 2870 ... see 2860, 2870.
S/360 mdl 85, 195 — selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) on 2870, or shared subchannel of 2880 ... see 2860, 2870, 2880.
S/370 mdl 115, 125 — Multiplexer Channel (special feature) ... see 3115, 3125.
S/370 mdl 135 — multiplexer channel (standard), Selector Channels (special features) ... see 3135.
S/370 mdl 135-3 — byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.
S/370 mdl 138 — byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.
S/370 mdl 145 — multiplexer channel, selector channels (standard) ... see 3145.
S/370 mdl 145-3 — byte multiplexer channel (standard), block multiplexer channel ... see 3145-3.
S/370 mdl 148 — byte multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158. Limitations: Each SD-II attached to a block multiplexer channel operating in block multiplexing mode must be assigned to a unique shared subchannel and if the 2701 is to be field installed, it must be at EC level 309060 or above.
S/370 mdl 165, 168, 195 — selector channel of 2860, multiplexer channel of 2870, Selector Subchannels (special features) of 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.
3031 or 3032 Processor — byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032. See ’3031, 3032, 3033 Limitations’ below.
3033 Processor — byte multiplexer channels (2 are standard), block multiplexer channels (10 are standard) ... see 3033. See ’3031, 3032, 3033 Limitations’ below.
3031, 3032, 3033 Limitations: Each SD-II attached to a block multiplexer channel operating in block multiplexing mode must be assigned to a unique shared subchannel and, if the 2701 is to be field installed, it must be at EC level 309060 or above.

3431 Processor -- byte multiplexer channel (special feature), block multiplexer channel (special feature) ... see 3431.
3431 Processor -- byte multiplexer channel (standard), block multiplexer channel (two are standard) ... see 3431.


Specify: [1] Voltage (AC, 1-phase, 3-wire, 60Hz): #9902 for 208 V, or #9904 for 230 V.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
[3] Specification Sheet: A completed 2701 Specification Sheet, must be submitted at time of order ...
### AUTOCALL (#1302, 1303, 1314).
Provides automatic dialing capabilities on Public Switched Networks. One of these features is required for each line equipped to automatically originate calls on switched networks. For the appropriate Automatic Calling Units, see Chart 3B on M 2701.

- **#1302** — requires either an IBM Terminal Adapter Type I, Mod II (#4640) with speed selection #9581, or Telegraph Adapter Type II (#7695).
- **#1314** — requires Synchronous Adapter Type II (#7698).

**Maximum:** One per adapter ... two #1302s or one #1303 or #1314 per 2701 without Expanded Capability (#3815) ... four #1302s or two #1303s or #1314, or two #1302s and one #1303 or #1314 if #3815 is installed.

**Channel Interface, Second (#1860).**
Provides the ability to attach the adapter(s) housed in the Expanded Capability (#3815) gate to a channel interface other than the one provided with the basic 2701. Maximum: One. **Prerequisite:** Expanded Capability (#3815) and an Expansion Feature (#3855).

### Dual Code (#3455).
Permits a second code type, optional under program controlled selection, for the Synchronous Data Adapter Type II (#7697, 7698). Specify: #9070 for EBCDIC,
#9071 for ASCII, or #9072 for 6-bit Transcode. **Prerequisite:** A Synchronous Data Adapter Type II (#7697, 7698) with capability to interface with an additional facility ... determination of which interface is operational is under program control.

**For #7695 or #7696**

- #3461 — for operation on Common Carrier Type 5701, 5703, 8801 or 8803 Widesband Services.

**#3462 — for operation on the Public Switched Telephone Network or a Non-switched Voice Grade Line.**

**Limitation:** Autocall (#1303) is not operational on the Dual Communication Interface.

**For #7697 or #7698**

- #3463 — for operation with facility E1, E2 or E3.
- #3464 — for operation with facility C4, C5, C6, D3, D4, D5 or D6.

**Limitation:** Autocall (#1314) is not operable on the Dual Communication Interface.

### Restricted: The 2701 does not permit simultaneous operation of two lines attached to the same Synchronous Data Adapter. **Prerequisite:** An appropriate Synchronous Data Adapter Type I (#7695, 7696) or Type II (#7697, 7698) ... see Internal Clock (#4703) or Synchronous Clock (#7692, 7693) for applicability.

**Expanded Capability (#3815).**
Provides an additional gate that allows additional combinations of adapters ... allows for one additional adapter from Category II, or up to two adapters from Category I. **See “Maximum Configuration” below.**

### EXPANSION FEATURE (#3855).
Provides the 2701 with the capability of operating with an addl adapter. The number required per ... the number of adapters specified ... see “Maximum Configuration” below. **Maximum:** One per 2701 without Expanded Capability (#3815) ... three per 2701 with #3815.

### IBM LINE ADAPTER (#4636, 4637).
A modem for 2-wire limited-distance use up to 8 wire-miles ... see Limited Distance Line Adapter Type 2 in SRL G42-3435 for specifications and restrictions. **Prerequisite:** A Cable GA24-3435 for operation at 134.5 bps over facility G2, #4637 — for operation at 600 bps over facility G2.

**Prerequisites:** Each #4636 requires an IBM Terminal Adapter Type I, Mod II (#4640) with speed selection #9581 [or the replaced IBM Terminal Adapter Type I (#4645)] ... each #4637 requires a #4640 with speed selection #9582 [for the replaced #4646], or an IBM Terminal Adapter Type I (#4649).

### IBM TERMINAL ADAPTER TYPE MOD II (#4640).
Controls data transfers between S/360 or S/370 and 100/100/1070/2740/2741/5010 over facilities which conform to the specifications in the manual referenced above. **Prerequisite:** A Cable GA24-3435 for operation at 134.5 bps over facility G2, #4637 — for operation at 600 bps over facility G2.

**Prerequisites:** Each #4636 requires an IBM Terminal Adapter Type I, Mod II (#4640) with speed selection #9581 [or the replaced IBM Terminal Adapter Type I (#4645)] ... each #4637 requires a #4640 with speed selection #9582 [for the replaced #4646], or an IBM Terminal Adapter Type I (#4649).

### IBM TERMINAL ADAPTER TYPE E (#4652).
Provides control over S/360 to S/370 and 100/1070/2740/2741/5010 over facility C1, C2, D1, D2, or G2. Includes vertical and longitudinal redundancy checking for 100/1070/2740 terminals and 2740s equipped with Record Checking (#6114). **Prerequisite:** A Cable GA24-3435 for operation at 134.5 bps to 100/1070/2740/2741/5010 ... #9582, for operation at 600 bps to 1070/5010/2740 mdl 2s: #9581 can be changed in the field to #9582, or vice versa. **Note:** A 2740 may be attached with any combination of its Record Checking (#6114) and Station Control (Permit Feature #7479) features, or with neither.

If the facility is G2 conforming to the line requirements for Limited Distance Line Adapter Type 2 in SRL G42-3435; #4640 may be used with an IBM Line Adapter (#4636, 4637) in lieu of a data set. **Maximum:** One per 2701 without Expansion Feature (#3855) ... two with #3855 ... three with two #3855 and Expanded Capability (#3855) ... four with three #3855s and Expanded Capability (#3815) ... four with three #3855s and #3815. **Limitations:** See "Maximum Configuration" below. **Special Requirements:** See Autocall (#1302) for applicability.

**Note:** #4640 with #9581 or #9582 replaces the withdrawn IBM Terminal Adapter Type I (#4645, 4646).

### IBM TERMINAL ADAPTER TYPE II (#4648).
Controls data transfers between S/360 or S/370 and 1030 terminals operating at 600 bps over facility G2, if the facility conforms to the line requirements for Limited Distance Line Adapter Type 2 in SRL G42-3435; #4648 may be used with an IBM Line Adapter (#4636, 4637) in lieu of a data set. **Maximum:** One per 2701 without Expansion Feature (#3855) ... two with #3855 ... three with two #3855s and Expanded Capability (#3855) ... four with three #3855s and #3815. **Limitations:** See "Maximum Configuration" below. **Special Requirements:** See Autocall (#1302) for applicability.

**Note:** IBM #4648 replaces IBM #9582. **Prerequisite:** IBM CPU Base 2701.

### Internal Clock (#4703).
Provides clocking, under program selection, for 1200 bps or 2400 bps operation. **Maximum:** One per 2701 without Expanded Capability (#3815) ... two with #3815 and an Expansion Feature (#3855). **Limitations:** See "Maximum Configuration" below. **Prerequisite:** This feature requires a CPU with 16K bytes of core storage or larger.

### INTERNAL CLOCK (#4703). **Required for Synchronous Data Adapter Type I (#7697, 7698) or Dual Communication Interface (#4362) if at least one data set does not provide clock pulses. Provides clocking, under program selection, for 1200 bps, 2000 bps or 2400 bps operation. **Maximum:** One per 2701 without Expanded Capability (#3815) ... two with #3815 and an Expansion Feature (#3855). **Limitations:** See "Maximum Configuration" below. **Prerequisite:** If field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that) ... to turn power on or off on the 2701 without generating spurious signals; thus, a CPU that can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** In all cases there are compatible EC level requirements.

### IBM LINE ADAPTER BASE (#4708).**
Provides for mounting of up to two IBM 1200 bps Line Adapters and their associated Automatic Call Origination features. **Limitation:** Cannot be installed when...
IBM 1200 BPS LINE ADAPTER, LEASED (#4781). Provides one IBM 1200 Bps Line Adapter which is suitable for communications over facility C4 with a similar line adapter. Maximum: Two per 2701. Field Installation: Yes. Prerequisite: IBM Line Adapter Type II (#7698), with a Synchronous Clock (#7692).

IBM 1200 BPS LINE ADAPTER, SWITCHED (#4782). Provides one IBM 1200 Bps Line Adapter which is suitable for communications over facility C4 with a similar line adapter. Attatchment of this line adapter to the switched telephone network requires the use of a Type CBS Data Access Arrangement. This line adapter includes the automatic answering capability. Maximum: Two per 2701. Field Installation: Yes. Prerequisite: IBM Line Adapter Base (#4708).

AUTOMATIC CALL ORIGINATION (#4791). Provides the capability of automatically (under program control) dialing over the switched telephone network to a remote terminal. Limitations: This feature can be used on rotary dial systems only. Cannot be installed with any other features above (#7401). Maximum: One per IBM 1200 BPS Line Adapter, Switched (#4782) and Autocal (#8134).

PARALLEL DATA ADAPTER (#5500). Provides a 16-bit wide path to customer devices ... odd parity and redundancy checking ... can be expanded to 48 bits [see Parallel Data Expansion (#5505) for operation half-duplex at speeds limited only by channel and system configuration. A maximum of eight customer devices can be connected to the interface. However, there is but one data path shared by all devices. Maximum: One per 2701 without Expansion Feature (#3855) ... two per 2701 with one #3855 ... two or more with two or more adjacent #3855s and Expanded Capability (#3815) [either or both #5500s may have more than two #3855s and #3815 ... four per 2701 with three #3855s and #3815 [none of the #5500s may have more than two #3855s]. Limitations: See "Maximum Configuration" below. See Autocal #8134.

PARALLEL DATA TIMEOUT (#5501). Provides a 2-second timeout of the external device responses to data transfer requests from a Parallel Data Adapter (#5500). Maximum: One per #5500.


SECOND CHANNEL ENABLE/DISABLE SWITCH (#6301). Provides ability to disable 2701 functions to either CPU when the Second Channel Interface (#1860) is being used with two CPUs ... for field installation prior to December 29, 1967 ... standard on #1860s shipped after that. Prerequisites: Second Channel Interface (#1860) ... 2701 must be at EQ or LEO.

SELECTABLE SYNCHRONOUS CLOCK (#7401). Provides a synchronous clock which is capable of operation at 600 bps or at 1200 bps and provides a manual switch to allow the operator to select one of these two speeds. Maximum: One per Synchronous Data Adapter Type II (#7698). Limitations: Cannot be installed with any other synchronous clock or with Automatic Call Origination (#4791) when the Dual Communication Interface is installed, and this clock is to operate on both the basic and dual interface, both interfaces must operate at the same speed.

Prerequisites: Synchronous Data Adapter Type II (#7698).

††SYNCHRONOUS DATA ADAPTER TYPE I (#7695, 7696). [Plant Installation only] Provides control of data transfers between S/360 or S/370 and 4-out-of-8 code synchronous terminals ... Maximum: One per Synchronous Data Adapter, Type II (#7698). Limitations: Cannot be installed with any other synchronous clock or with Automatic Call Origination (#4791). See "Maximum Configuration" below. Special Requirements: See Autocal #8134 for applicability.

††SYNCHRONOUS DATA ADAPTER TYPE II (#7697, 7698). Provides control of data transfers between S/360 or S/370 and binary synchronous terminals ... see "Terminal Devices" above. #7697 - permits operation with high speed digital facilities. #7698 - voice grade facilities.

Specify: For each adapter one of the following is required ... #9060 for EBCDIC code, or #9062 for ASCII code. Limitations: Requires a Data Expansion Feature or #4781. ... with a System/3 with #2074, a S/360 mdl 20 with #2074, a S/360 mdl 25 with #4860, a 2701 with #7703 or #7706, an I/O System with #7550, a 2715 with #3855, a 3747, 3775 or 3779 with #2321 mdl 2 ... also see "Maximum Configuration" below. #9061 and/or #9062 cannot be used to communicate with a Terminal Control Unit or a 5231. Maximum: One per 2701 without Expanded Capability (#3815) ... two with #3815 and one Expansion Feature (#3855) for additional line capability per adapter, see Dual Communication Interface (#3463, 3464).

Special Requirements: See Autocal (#1314), Dual Code (#3455), Station Selection (#7477), Synchronous Clock (#7692, 7693) and Transparency (#8029) for applicability. Note: When ordering #7697 or #7698 for field installation in adapter position No. 1, all features in position No. 1 and No. 2 must be removed ... for field installation in position No. 3, all adapter features in position No. 3 and all features in position No. 4 must be removed.

SYNCHRONOUS CLOCK (#7692, 7693). #7692 - required for a Synchronous Data Adapter Type II (#7698) or Dual Communication Interface (#3464) if at least one data set attached requires external clocking at 1200 bps. #7693 - required for the same combinations above but one data set attached requires external clocking at 2400 bps. Maximum: One per #7697 or #7698. Limitation: If #7692 or #7693 is required for both lines use Dual Communication Interface (#3464), both lines must operate at the same speed.

STATION SELECTION (#7477). Required when a Synchronous Data Adapter Type II (#7697, 7698) and/or Dual Code (#3455) is required for expansion on a leased lines or a Non-switched Voice Grade Line. Maximum: One per #7697 or #7698.

TELEGRAPH ADAPTER TYPE I (#7860-7862). Controls data transfers between S/360 or S/370 and various teletypewriter terminals ... one control must be identical to AT&T Selective Calli ng Terminals Type 8382/8383 or WU Plan 115A Terminals ... a 62.6 millampere neutral DC Loop is required ... both types of terminals cannot be mixed on the same line. #7860 - for operation at 45.5 bps with facility A1. #7861 - for operation at 56.9 bps with facility A2. #7862 - for operation at 74.2 bps with facility A3. Maximum: One per #7697 or #7698 without Expansion Feature (#3855) ... two with one #3855 ... three with two #3855s and Expanded Capability (#3815) ... four with three #3855s and #3815. Limitations: See "Maximum Configuration" below. See Autocal #8134.

TELEGRAPH ADAPTER TYPE II (#7865). Controls data transfers between S/360 or S/370 and Mod 33 35 35 TTY Terminals (8 level code at 110 bps only) with facility C2. Maximum: One per 2701 without Expansion Feature (#3855) ... two with one #3855 ... three with two #3855s and Expanded Capability (#3815) ... four with three #3855s and #3815. Limitations: See "Maximum Configuration" below. Special Requirements: See Autocal #1302 for applicability.

TRANSPARENCY (#8029). Provides a Synchronous Data Adapter with Transparency (Type II (#7697, 7698) and/or Dual Code (#3455) with the ability to transmit and receive 8-bit binary data as well as EBCDIC or ASCII codes ... or 6-bit binary data as well as 6-bit Transcode. Transparency for ASCII modifies VRC/LRC checking to VRC/CRC checking. Limitation: ASCII code transparency is not available on the 2780 Data Transmission Terminal, 2770 Data Communication System, 3780 Data Communications Terminal, 3735 Programmed Buffer Terminal, or a System/3 or System/32. Therefore a 2780, 3735 or System/3 with ASCII code will not operate with a 2701 equipped with #8029 when the #8029 is assigned to the ASCII code. To communicate with a 2701 in transparent mode, the 2780 must be equipped with EBCDIC Transparency (#8030), the 2770 with EBCDIC Transparency (#3608), the 2780 with EBCDIC Transparency (#3601), or the System/3 with Text Transparency (#7850). The 3735 will operate in EBCDIC with a 2701 with or without #8029 assigned to EBCDIC. On System/3, EBCDIC and EBCDIC Transparency are standard and one is selected by programming. The 5231 mdl 2 does not support transparent mode. Specify: Either or both of the following - #9060 for use with #9061, #9061 or #9062 on Synchronous Data Adapter Type II (#7697, 7698) ... or #901 for use with #9070, 9071 or 9072 on Dual Code (#3455) and/or #7697 or #7698. Prerequisites: A Synchronous Data Adapter Type II

†††For further information, see M 2700 pages.

++Orders for #7695 or #7696 are on an "as available" basis ... customer initiated orders or orders for 2701s which include either feature will subject the 2710 orders to an "as available" basis.

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### 2701 Data Adapter Unit (cont’d)

(′7697, 7698) ... when this feature is ordered there are additional restrictions and limitations to the facility and operation. For details, see SRL GA27-3004.

**MAXIMUM CONFIGURATION**

As an aid in determining allowable and maximum adapter configurations, the adapters have been categorized as belonging to Category I or Category II.

If more than two adapters from Category I, more than one adapter from Category II, or at least one adapter from each of the two Categories are to be installed, Expanded Capability (′3815) is required.

**Category I**

- IBM Terminal Adapter Type I, Mod II (′4640)
- IBM Terminal Adapter Type II (′4648)
- Telegraph Adapter Type I (′7860, 7861, 7862)
- Telegraph Adapter Type II (′7865)
- Parallel Data Adapter (′5500), with two or less Parallel Data Extensions (′5505)

**Category II**

- Parallel Data Adapter (′5500), with more than two Parallel Data Extensions (′5505)
- Synchronous Data Adapter Type I (′7695, 7696)
- Synchronous Data Adapter Type II (′7697, 7698)
- IBM Terminal Adapter Type III (′4656, 4657)

**Maximum Basic 2701 (w/o Expanded Capability, ′3815)**

Two adapters from Category I ... or one from Category II.

**Maximum 2701 w ′3815**

Four adapters from Category I ... or two from Category II ... or two from Category I and one from Category II.

**Notes:** [1] An Expansion Feature (′3855) is required for each adapter after the first.


[3] Unless otherwise stated, an adapter as listed in the above Categories includes the adapter and all its associated features.

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**SPECIAL FEATURE PRICES:** Before ordering, consult individual feature descriptions and “Maximum Configuration” above.

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* The FIC for conversion from ′7697 to ′7698 or vice versa is $127.
† † † Orders for ′7695 or ′3816 are on an “as available” basis ... customer initiated deferrals or orders for 2701s which include either feature will subject the 2701 orders to an “as available” basis.

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IBM

2702 TRANSMISSION CONTROL
[no longer available]

Specify: Communication Cable Order. A Cable Order must be submitted for each order where the added feature requires external cable. See S/370 Installation Manual - Physical Planning, SRL GC22-7004, for cabling information.

SPECIAL FEATURES
The following special features are on an 'As Available' basis for field installation.

Limitations:
[1] Up to three of the available terminal controls #4615, #4616, #7911, #7912 can be installed.
[2] Up to four selective speeds can be specified.
   (a) With either #4615 or #7911, one selective speed must be specified.
   (b) With each Add'l Selective Speed (#1065), another selective speed other than that specified for #4615 or #7911 must be specified.
[3] The combined total of terminal controls [maximum, three], Add'l Selective Speeds (#1065) [maximum, two], 2741 Break (#8055) [maximum, one], and Type I Terminal Interrupt (#8020) [maximum, one] cannot exceed four.
[4] #4616 cannot be used when 2741 Break (#8055) is installed.

ADDITIONAL SELECTIVE SPEED (#1065). To add an additional different selective speed with IBM Terminal Control-Type I (#4615) or Telegraph Terminal Control-Type I (#7911), an IBM 20 Terminals adapter for attachment of terminals/facilities of more than one speed to the same terminal control. Maximum: Two ... with limitations above. Specify: With #4615 — #9683 for 75 bps, #9684 for 134.5 bps, or #9685 for 600 bps. with #7911 — #9680 for 45.5 bps, #9681 for 56.9 bps, or #9682 for 74.2 bps. Prerequisites: IBM Terminal Control-Type I (#4615) or Telegraph Terminal Control-Type I (#7911) Selective Speed (#9685) requires Speed Extension (#7387).

AUTOCALL ADAPTER (#1290). For attachment to an automatic calling unit. Maximum: Eight ... with AutoCall Option (#1311). Prerequisites: Add'l Selective Speed (#1065). Sixteen. Prerequisites: AutoCall Feature (#1310), and, for each line, a Data Set Adapter (#3233).

AUTOCALL FEATURE (#1310). Provides automatic dialing capabilities on facilities C1 and C2 for up to eight lines. Maximum: One.

AUTOCALL EXPANSION (#1311). Expands the automatic dialing capability to sixteen line attachments. Maximum: One. Prerequisite: AutoCall Feature (#1310).

AUTO POLL (#1319). Operates in conjunction with IBM Terminal Control-Type I (#4615) or IBM Terminal Control-Type II (#4616) to allow continuation of polling after negative responses on all of the lines served by those terminal controls without having program interruptions. Maximum: One. Prerequisite: IBM Terminal Control-Type I (#4615) or Type II (#4616).

DATA SET LINE ADAPTER (#3233). To attach an external data set for operation — at 110 bps over facility C2 — at 134.5 bps over facility C1, C2, or D1 — at 600 bps over facility D2. Or to attach a line to a 2711 Line Adapter Unit. Maximum: Fifteen ... with 31 Line Expansion (#7935), thirteenth-one.

EXPANSION BASE (#3853). Required if an IBM Line Adapter (#4634, 4635) is to be installed. Maximum: One.

IBM LINE ADAPTER (#4612, 4613). A modem for 2-wire, limited distance use up to 8 wire-miles. See 'Limited Distance Line Adapter, Type 2' in SRL GA24-3435-5 for specifications and restrictions. Maximum: #4612 — for use with 1060 or 1070 systems, or 2740/2741 terminals or 5010 operating at 134.5 bps over facility G2.
#4613 — for use with 1030, 1070 systems, or 2740 md1 2 terminals or 5010 operating at 600 bps over facility G2.
Maximum: #4612 and #4613 are assigned a weight of three (3) each, where the total weight of IBM Line Adapters (#4612, 4613, 4634 and 4635) may not exceed fifty (50). Limitations: #4612 and #4613 may not be installed if both 1032 Attachment (#7918) and IBM Line Adapters (#4634 or 4635) are to be installed. Only fifteen #4612/4613s may be installed if #7918 is installed. If maximum is exceeded, investigate possible use of a 2711 Line Adapter Unit. Prerequisites: For either — IBM Terminal Control-Type I or II (#4615, 4616). For #4613 — Speed Extension (#7387) ... for more than fifteen #4612s-31 Line Expansion (#7955).

IBM LINE ADAPTER (#4634, 4635). A modem for local use up to 4.75 wire-miles over facility G1. See 'Limited Distance Line Adapter, Type 12' in SRL manual GA24-3435-5 for specifications and restrictions. Maximum: #4634 and #4635 are assigned a weight of two (2) each, where the total weight of IBM Line Adapters (#4612, 4613, 4634, 4635) may not exceed fifty (50). Limitations: #4634 and #4635 may not be installed if both 1032 Attachment (#7918) and IBM Line Adapters (#4612, 4613) are to be installed. Only twenty-one #4634/4635s may be installed. Prerequisites: IBM Terminal Control-Type I (#4615) and Expansion Base (#3853) and, for more than fifteen, 31 Line Expansion (#7955).

IBM TERMINAL CONTROL-TYPE I (#4615). Controls for attachment of 1060/1070s/2740s/2741s/5010s. Includes vertical and horizontal redundancy checking for 1060s/1070s/5010s and the same checking is provided for 2740s if they are equipped with Record Checking (#1144). 40s can be attached with any combination of their Record Checking (#1144) and Station Control (#7479) features, or with neither. Maximum: One ... also see 'Limitations' above. Specify: Selective Speed — #9683 for 75 bps operation, #9684 for 134.5 bps, or #9685 for 600 bps ... for more than one speed, see Add'l Selective Speed (#1065). Prerequisites: Terminal Control Base (#9696) ... see 'Specify'. Selective Speed (#9685) also requires Speed Extension (#7387).

IBM TERMINAL CONTROL-TYPE II (#4616). Controls for attachment of 1031 Input Station md1 As ... includes vertical redundancy checking. Maximum: One ... also see 'Limitations' above. Limitation: Not available if 2741 Break (#8055) is installed. Prerequisite: Speed Extension (#7387) ... Terminal Control Base (#9696) [see 'Specify'].

ISOLATION, CONTROL UNIT (#7387). For field installation only on units shipped prior to December 29, 1967 ... standard on units shipped after that. To turn power on or off on the 2702 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. Prerequisite: in all cases there are compatible EC level requirements.

REMOTE SWITCH ATTACHMENT (#6148). Provides partitioning and the ability to attach the Two Processor Switch (#6110) to a S/360 md1 65 MP which has the Configuration Control Panel (#1505) installed or to a 2167 Configuration Unit ... for use in a multiprocessor S/360 md1 65 or a S/360 md1 67 only when no Type I or II IBM Terminal Control is installed on this control unit. Maximum: One ... see 'Specify'.

TELEGRAPH TERMINAL CONTROL-TYPE I (#7911). Controls for attachment of AT&T 8382/8383 or WU Plan 15A terminals. Maximum: One ... also see 'Limitations' above. Specify: Selective Speed — #9680 for 45.5 bps operation, #9681 for 56.9 bps, or #9682 for 74.2 bps ... for more than one speed, see Add'l Selective Speed (#1065). Prerequisite: Character — #9100. When specified, it governs for all lines using #7911 used with this type terminal control only. Prerequisite: Terminal Control Base (#9696) ... see 'Specify'.

TELEGRAPH TERMINAL CONTROL-TYPE II (#7912). Controls for attachment of TWX stations using 8 level code at 110 bps. Maximum: One ... also see 'Limitations' above. Prerequisite: Terminal Control Base (#9697) ... see 'Specify'.

1032 ATTACHMENT (#7918). To attach a 1032 Digital Time Unit via a 20' cable supplied with the 1032. Limitations: Must go on Line Address No. 1 ... unavailable if more than fifteen IBM Line Adapters (#4634, 4635) are installed, or if both IBM Terminal Control Adapters (#4612, 4613) and an IBM Line Adapter (#4634, 4635) are installed. Maximum: One. [Note: Other 1032 terminals may operate remote Print-On-Line 1032. Prerequisites: IBM Terminal Control-Type I (#4616) and Speed Extension (#7387) ... if not to be attached to a line previously specified for Line Address No. 1, a Data Line Adapter (#5335) or IBM Line Adapter (#4613) specified for Line Address No. 1 is also required. Digital Time Read-out Control, 2702 (#3273) is required on the 1032.

TERMINAL CONTROL EXPANSION (#7935). Required if both IBM terminal control equipment and terminals are to be attached to the same 2702. Maximum: One. Prerequisites: Terminal Control Base (#9696) and (#9697) ... see 'Specify'.

31 LINE EXPANSION (#7955). Increase line capability to thirty-one half-duplex communicating at speed up to 200 bps. Limitation: Cannot be installed with Speed Extension (#7387). Maximum: One.

2741 BREAK (#8055). Allows the IBM Terminal Control-I (#4615) to operate with a 2741 with Receive Interrupt (#7400). #4615 may be used independently of this feature even though

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2702 Communication Control (cont'd)

#8055 is installed. Limitation: Not available if Terminal Control-Type II (#4616) or Type I Terminal Interrupt (#8200) is installed. Maximum: One. Prerequisites: IBM Terminal Control-Type I (#4615) with Selective Speed (#9684). If IBM Line Adapters are used they must be 4-wire version. If the #4615 is to communicate with 2741s with Transmit Interrupt and any other 134.5 bps terminals, two #9684s are required, one associated solely with the interrupt terminals, the other solely with the non-interrupt terminals.

**TWO PROCESSOR SWITCH (#8110).** For switching the 2702 between two S/360 or S/370 multiplexer channels. Maximum: One. Prerequisite: In a S/360 model 67-2, Remote Switch Attachment (#6148) is required. If the Two Processor Switch is routed through the Configuration Control Panel (#1505) of a multiprocessing S/360 multi 65 system, Remote Switch Attachment (#6148) is required.

### TYPE I TERMINAL INTERRUPT (#8200).

Allows the IBM Terminal Control-Type I (#4615) to operate in a bi-directional interrupt mode capability with a 2741 with Transmit Interrupt (#7900) and Receive Interrupt (#4708 on 2741). #4615 may be used with non-interrupted equipped terminals even though #8200 is installed. Limitation: Not available if Terminal Control-Type II (#4616) or Type I Terminal Interrupt (#8200) is installed. Maximum: One. Prerequisite: IBM Terminal Control-Type I (#4615) with Selective Speed (#9684). If the #4615 is to communicate with 2741s with Transmit Interrupt and any other 134.5 bps terminal, two #9684s are required, one associated solely with the 2741s, and the other solely with the other terminals.

Verify compatibility when #8200 is to be added to a 2702 with an installed RPQ.

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### 2703 TRANSMISSION CONTROL

**No longer available**

Specify: A Cable Order must be submitted for each order where the added feature requires external cables. See S/370 Installation Manual - Physical Planning, SRL GC22-7004 for cabling information.

### SPECIAL FEATURES

The following special features are on an "As Available" basis for field installation.

#### LINE BASE FEATURES

**START-STOP BASE TYPE I (#7505).** To attach up to 88 half-duplex line appearances (12 Line Set Features) operating up to 165 bps. May be intermixed with Start-Stop Base Type II (#7506) and/or Synchronous Bases Type 1A (#7703), Type 1B (#7704), and Type 2A (#7706). Maximum: Three. [Note: A #7505 may be used to attach features normally attached via #7505, although the limitations for #7506 remain unchanged.] Prerequisite: The second #7505 installed requires Base Expansion (#1440).

**START-STOP BASE TYPE II (#7506).** To attach up to 24 half-duplex line appearances (3 Line Set Features) operating up to 600 bps. May be intermixed with Start-Stop Base Type I (#7505) and/or Synchronous Bases Type 1A (#7703), Type 1B (#7704), and Type 2A (#7706). Maximum: Six. [Note: A #7506 may be used to attach features normally attached via #7506, although the limitations for #7505 remain unchanged.] Prerequisite: The second #7506 installed requires Base Expansion (#1440).

**Synchronous Attachment (#7702).** To attach any synchronous lines to a 2703. Maximum: One. Prerequisite: Base Expansion (#1440).

**Synchronous BASE TYPE 1A (#7703), Type 1B (#7704), Type 2A (#7706).**

#### MAC/ MRC

- **Add'l Selective Speed**
  - 1065 $16 $76 $1.00 $39
- **Auto Dial Adapter**
  - 1290 $16 $76 1.00 91
- **Auto Dial Feature**
  - 1310 67 2,960 3.00 321
- **Auto Dial Call Option**
  - 1311 16 $76 1.00 166
- **Auto Poll**
  - 1319 56 2,535 4.00 166
- **Data Set Line Adapter**
  - 3233 21 1,085 3.00 91
- **Expansion Base**
  - 3853 NC NC NC
- **IBM Line Adapter**
  - 4612 33 1,505 1.00 116
- **600 bps**
  - 4613 33 1,505 1.00 116
- **IBM Terminal Control Type I**
  - 4615 38 1,715 1.00 142
- **Type II**
  - 4616 38 1,715 1.00 142
- **IBM Line Adapter - 2-wire**
  - 4634 24 1,175 1.00 116
- **4-wire**
  - 4635 24 1,175 1.00 116
- **Isolation, Control Unit**
  - 4700 NC NC NC
- **Remote Switch Attach**
  - 6148 NC NC NC
- **Speed Extension**
  - 7387 84 3,795 4.00 270
- **Telegraph Line Adapter**
  - 7985 21 1,010 4.00 193
- **Telegraph Terminal Control - Type I**
  - 7911 38 1,715 1.00 142
- **Type II**
  - 7912 38 1,715 1.00 142
- **1032 Attachment**
  - 7918 43 1,710 1.00 91
- **Terminal Control Expans**
  - 7935 21 1,065 1.25 91
- **Line Extension**
  - 7955 442 4,965 4.00 321
- **2741 Break**
  - 8055 10 506 1.00 91
- **Two Processor Switch**
  - 8110 84 3,795 3.50 423
- **Type I Terminal Interrupt**
  - 8200 33 1,345 NC 236

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IBM DP Machines

2703 Transmission Control (cont'd)

IBM TERMINAL CONTROL TYPE II (#4697).* To communicate with 1030 systems. Maximum: One. Prerequisite: IBM Terminal Control Base (#4619).

TELEGRAPH TERMINAL CONTROL BASE (#7905).* To attach a Telegraph Terminal Control, Type I (#7911) and/or Type II (#7912). Maximum: One.

TELEGRAPH TERMINAL CONTROL TYPE I (#7911).* To communicate with AT&T 83B2/83B3 or WU 115A terminals. Maximum: One. Prerequisite: Telegraph Terminal Control Base (#7905).

TELEGRAPH TERMINAL CONTROL TYPE II (#7912).* To communicate with TWX Model 33/35 terminals. Maximum: One. Prerequisite: Telegraph Terminal Control Base (#7905).

TELEGRAPH ATTACHMENT (#7876).* To attach Telegraph Line Sets (#7897) ... required when one or more 83B2/83B3, 115A, 2740 mdl 2 lines are attached via Telegraph Line Sets (#7897) ... NOT required when 83B2/83B3 and 115A lines are attached via 2740. Remote Multiplexer mdl 2s. Maximum: One.

SYNCHRONOUS TERMINAL CONTROL (#7715, 7716, 7717).* To communicate with synchronous terminals. 

#7715 — for terminals communicating in EBCDIC code.

#7716 — for terminals communicating in 6-bit Transcode.

#7716/9100 — for terminals communicating in transparent ASCII code.

Note: Transparency code modifies the VRC/LRC check to a CRC check, making the #7716/9100 a fourth synchronous terminal control type. Transparency capability is included in the #7715 and #7717 Synchronous Terminal Controls. When transparency is used with any of these codes, there are additional restrictions and limitations which are covered in SRL GA27-3004. Maximum: One of each ... three if no IBM Terminal Control Type I (#4696) or Type II (#4697) or IBM Line Set Model 2B (#7897). For #7715 - Synchronous Base Type 1B (#7704) or Type 2A (#7706). For #7717 — Synchronous Base Type 1B (#7704). Station Selection (#7473) may also be required ... see below.

STATION SELECTION (#7473).* Required when one or more lines are assigned to a Synchronous Terminal Control (#7715, 7716, 7717) which is functioning on a leased communications line as a terminal station. Maximum: One per #7715, 7716, 7717. Prerequisite: Synchronous Terminal Control (#7715, 7716, 7717).

★ LINE SET FEATURES — All lines in a given line set or line set expander must operate at the same speed (unless clocking is supplied by the data set) over the same type communications facilities with terminals employing the same type of line control; with either business machine or data set clocking, but not a combination.

★ DATA LINE SET (#3205).* For attachment of up to eight line appearances of asynchronous facilities (9304S, 9308S, 1070, 2740, 2741, 5010 and TWX Model 33/35 type) over facilities C1, C2, D1 or D2 ... or attachment of up to eight line appearances to a 27 Line Adapter Unit. Maximum: Twelve. Prerequisite: Start-Stop Type I Base (#7505) or Type II (#7506). Line Speed Option (#4577, 4587 or 4629) as appropriate ... either IBM Terminal Control Base (#4619), or for TWX, Telegraph Terminal Control Base (#7905) ... one of the following: IBM Terminal Control Type I (#4696) or Type II (#4697), or for TWX, Telegraph Terminal Control Type II (#7912).

★ DATA LINE SET EXPANDER (#3206).* Permits attachment of up to eight add'l lines to a Data Line Set (#3205). Maximum: One per #3205 ... ten per 2703. Prerequisite: One #3205 per #3206.

IBM LINE SET 1A (#4686).* Eight limited distance IBM line adapters for 2-wire local use up to 4.75 wire-miles each over facility G1. See Limited Distance Line Adapter Type I in SRL GA24-3435 for specifications and restrictions. To attach up to eight half-duplex line appearances accommodating 2740/2741 terminals. Limitation: Cannot be installed if any IBM Line Set 2s (#4688) are installed. Maximum: Total number of #4686s and IBM Line Set 1Bs (#4687) cannot exceed twelve. Prerequisites: Start-Stop Base Type I (#7505) or Type II (#7506) Speed Option (#4578, 4629 or 4657) for 134.5 bps IBM Terminal Control Base (#4619) ... IBM Terminal Control Type I (#4696) for more than nine #4686s, an addl #7505 or #7506 and its prerequisites — IBM LINE SET 1B (#4687).* Eight limited distance line adapters for 4-wire local use (up to 4.75 wire-miles) over facility G1. See Limited Distance Line Adapter Type I in SRL GA24-3435 for specifications and restrictions. To attach up to eight line appearances accommodating 2740/2741 terminals. Limitation: Cannot be installed if any IBM Line Set 2s (#4688) are installed. Maximum: Total number of #4687s and IBM Line Set 1As (#4686) installed cannot exceed twelve. Prerequisite: Same as for #4686.

† IBM LINE SET 2 (#4688).* Eight limited distance line adapters for 2-wire local use (up to 8 wire-miles each) over facility G2. See Limited Distance Line Adapter Type 2 in SRL GA24-3435 for specifications and restrictions. To attach up to eight half-duplex line appearances accommodating 1030/1060/1070/2740/2741/5010 systems and terminals. Limitation: Cannot be installed if any IBM Line Set 1As (#4686) or IBM Line Set 1Bs (#4687) are installed. Maximum: Four. Prerequisites: Start-Stop Base Type I (#7505) or Type II (#7506) ... Speed Option (#4587 for 134.5 bps, or #4679 for 600 bps) ... IBM terminal Control Type I (#4619) ... IBM Terminal Control Type I (#4696) or Type II (#4697).

† TELEGRAPH LINE SET (#7897).* For attachment of up to eight line appearances via facilities A1, A2 or A3 interfaces AT&T 83B2/83B3 and WU Plan 115A terminals, or 75 bps, 1050 or 2740 mdl 2 terminals. Maximum: Twelve. Caution: When operating ... series on the same telegraph current loop. RPO - must be applied to one 2703 and RPO - must be applied to the other 2703. These RPOs are NOT required for a single 2703 operating two telegraph line appearances on the same telegraph current loop. Prerequisites: Start-Stop Base Type I (#7505) or Type II (#7506) ... Speed Option (#4573, 4574, 4575 or 4586) as appropriate ... Telegraph Terminal Control Base (#7905). ... Telegraph Terminal Control Type I (#7911) ... Telegraph Attachment (#7876).

† TELEGRAPH LINE SET EXPANDER (#7898).* For attachment of up to eight add'l lines to a Telegraph Line Set (#7897). Maximum: One #7888 per #7897 ... ten per 2703. Prerequisite: A Telegraph Line Set (#7897).

† SYNCHRONOUS LINE SET (#7710).* For attachment of up to four synchronous line appearances via facilities C4, C5, C6, D3, D4, D5B, D5 or DSSB ... accommodates 2701s and 2703s with S2100S, S2100Ds, System/3s with #2074, S3/360 and 2050s with #2074, S/360 mod 25s with #4580 and #7551 or #7552, 1130s with #7690, 2715 mod 2s, 2770s, 1800s with #7550, 2760 and 3760s. Maximum: Six per Synchronous Base Type 1A (#7703) ... four per Type 1B (#7704) ... three per Type 2A (#7706) ... twelve per 2703. Limitation: See Synchronous Clock (27705). Prerequisites: Base Expansion (#1440) ... Synchronous Attachment (27702). Synchronous Base Type 1A (#7703), Type 1B (#7704) or Type 2A (#7706) ... Synchronous Terminal Control Base (#7715, 7716 or 7717). Synchronous Clock (#7705) may be required.

SYNCHRONOUS CLOCK (#7705).* Required for attachment of facilities C4, D3, ... each #7705 permits attachment of up to four such facilities. Limitation: The maximum number of Synchronous Line Sets (#7710) is reduced when any #7705s are installed ... see "General Limitation" below. Maximum: One per each #7710 ... six per Synchronous Base Type 1A (#7703), Type 1B (#7704) or Type 2A (#7706) ... six per 2703. Prerequisites: Synchronous Line Set (#7710) ... Synchronous Line Speed Option (#7711).

★ SPEED OPTIONS

ASYNCHRONOUS DEVICES

LINE SPEED OPTION (#4873-4879).* Defines the line speed available for asynchronous features on the 2703. Maximum: Seven, one of each of the following: #4573 - 45.5 bps for common carrier half-duplex

#4874 - 56.9 bps for telegraph service

#4875 - 74.2 bps

#4876 - 75 bps for 2740 mod 2s connected via telegraph channels

#4877 - 110 bps for TWX

#4878 - 134.5 bps for 1060 systems, 2740/2741 terminals, 1070 systems or 5010 not requiring 600 bps

#4879 - 600 bps for 1030 systems, and 2740 mod 2s, 1070 systems or 5010 requiring 600 bps.

SYNCHRONOUS DEVICES

SYNCHRONOUS SPEED OPTION (#7711).* Defines the 1200 bps synchronous line speed for Synchronous Clock(8) (#7706). Note: This option may not be used with any Synchronous Line Set on which a data set clocked line appears. Maximum: One per 2703

★ AUTOCALL FEATURES

AUTOCALL (#1340 for first, #1341 for second). Each provides

† For further information, see M 2700 pages.

†† SRL GA24-3435-2, or subsequent revisions.

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When using #1340 or #1341 with a Synchronous Line Set, a first or second autocall feature may be associated with two Synchronous Line Sets (eight binary synchronous communications lines) if both #7711s are on the same Synchronous Base, have consecutive addresses, and the first begins on a base address boundary which is a multiple of eight. Maximum: One of each. Prerequisites: One Data Line Set (#3205) or Data Line Set Expander (#3206) for each #1340 or #1341 ... or one or two Synchronous Line Sets (#7710) for each #1340 or #1341 ... #1341 requires #1340.

**TWO PROCESSOR ATTACHMENT FEATURE**

**TWO PROCESSOR SWITCH (#8110).** For switching the 2703 channel interface between two S/360 or S/370 multiplexer channels. Maximum: One. Prerequisite: Emergency Power-Off Control on attached processing units.

**ISOLATION FEATURE**

**ISOLATION, CONTROL UNIT (#4700).** [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2703 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. Prerequisite: in all cases there are compatible EC level requirements.

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**GENERAL LIMITATION**

Combinations of the following features may not exceed a total assigned weight of nine (9) per Start-Stop Base Type I (#7505) or Type II (#7506) and six (6) per Synchronous Base Type 1A (#7703), Type 1B (#7704) or Type 2A (#7706). Due to this limitation, it may be necessary to order three Start-Stop Base Type Is (#7505) with some unusual configurations.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Assigned Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Line Set (#3205)</td>
<td>1</td>
</tr>
<tr>
<td>Data Line Set Expander (#3206)</td>
<td>0</td>
</tr>
<tr>
<td>Telegraph Line Set (#7897)</td>
<td>1</td>
</tr>
<tr>
<td>Telegraph Line Set Expander (#7898)</td>
<td>0</td>
</tr>
<tr>
<td>IBM Line Set 1A (#4686)</td>
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</tr>
<tr>
<td>IBM Line Set 1B (#4687)</td>
<td>1</td>
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<tr>
<td>IBM Line Set 2 (#4688)</td>
<td>2</td>
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<tr>
<td>Synchronous Line Set (#7710)</td>
<td>1</td>
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<tr>
<td>Synchronous Clock (#7705)</td>
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</tr>
</tbody>
</table>

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**SPECIAL FEATURE PRICES:** Before ordering, consult individual feature description and "General Limitation" above. A completed, revised 2703 Specification Sheet, and/or a copy of the latest preceding specification sheet must be submitted with each order for special features.

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**LINE BASE FEATURES**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Assigned Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Term Control Base</td>
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<tr>
<td>IBM Term Control Type I</td>
<td>37</td>
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<tr>
<td>2741 Break</td>
<td>10</td>
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<tr>
<td>Type I Terminal Interrupt</td>
<td>200</td>
</tr>
<tr>
<td>IBM Term Cntrl Type II</td>
<td>37</td>
</tr>
<tr>
<td>Tele Term Cntrl Base</td>
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<tr>
<td>Tele Term Cntrl Type I</td>
<td>37</td>
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<tr>
<td>Tele Term Cntrl Type II</td>
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<tr>
<td>Telegraph Attachment</td>
<td>48</td>
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<tr>
<td>Synchronous Terminal Control</td>
<td>476</td>
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**LIMITATION**

**TERMINAL CONTROL FEATURES**

<table>
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<th>Feature</th>
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<td>Data Line Set</td>
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<tr>
<td>Data Line Set Expander</td>
<td>59</td>
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<tr>
<td>IBM Line Set 1A</td>
<td>101</td>
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<tr>
<td>IBM Line Set 1B</td>
<td>101</td>
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<tr>
<td>IBM Line Set 2</td>
<td>156</td>
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<tr>
<td>Telegraph Line Set</td>
<td>90</td>
</tr>
<tr>
<td>Tele Line Set</td>
<td>70</td>
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<tr>
<td>Synchronous Line Set</td>
<td>421</td>
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<tr>
<td>Synchronous Clock</td>
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**SPEED OPTIONS**

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<td>Line Speed Option (asynchronous)</td>
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<tr>
<td>45.5 bps</td>
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<tr>
<td>56.9 bps</td>
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<td>74.2 bps</td>
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<tr>
<td>75 bps</td>
<td>1,00</td>
</tr>
<tr>
<td>110 bps</td>
<td>1,00</td>
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<tr>
<td>134.5 bps</td>
<td>1,00</td>
</tr>
<tr>
<td>600 bps</td>
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<tr>
<td>Synch Line Speed Option</td>
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**AUTOCALL FEATURES**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Assigned Weight</th>
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</thead>
<tbody>
<tr>
<td>Autocall -- first</td>
<td>129</td>
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<tr>
<td>Autocall -- second</td>
<td>129</td>
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**TWO PROCESSOR ATTACHMENT FEATURE**

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<th>Feature</th>
<th>Assigned Weight</th>
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</thead>
<tbody>
<tr>
<td>Two Processor Switch</td>
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</tbody>
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**ISOLATION FEATURE**

<table>
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<tr>
<th>Feature</th>
<th>Assigned Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolation, Control Unit</td>
<td>4700</td>
</tr>
</tbody>
</table>

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**Add $189 when Full Transparency (#9100) is specified.**

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**2711 LINE ADAPTER UNIT**

**Purpose:** Unit for attachment to 2025 Processing Unit(s) equipped with an Integrated Communications Attachment (3135, 3135-3, 3138 Processing Unit(s) equipped with an Integrated Communications Adapter and/or 2702/2703 Transmission Control(s), and/or 370/3705 Communications Controller). It provides for the attachment of IBM Line Adapters for a 2025 or 3135, 3135-3, 3138 using an ICA feature and attachment of additional IBM Line Adapters for 2702s/2703s/3704s/3705s. The IBM Line Adapters serve as modems for use on appropriate communications facilities, permitting communications with similarly equipped IBM terminals.

**Highlights:** A modular unit... used, common carrier data sets are not required.

Three types of IBM Line Adapters can be installed to provide: limited distance (8 wire-miles) communications... high speed channel may be operated point-to-point or multipoint.

The basic 2711 accommodates up to four IBM Line Adapters, in any combination... more than four, Line Adapter Modules (#4794) are required. Each #4794 permits attachment of up to four additional IBM Line Adapters, in any combination. A maximum of seven #4794s can be installed, for a total of thirty-two IBM Line Adapters per 2711. Not to be reproduced without written permission.

**Communications Facilities:** The 2711, when equipped with appropriate IBM Line Adapter(s), can attach to common carrier leased private line telephone channels or privately owned communications facilities conforming to the specifications described in SRL GA24-3435* under: Limited Distance Line Adapter, Type 2... Shared Line Adapter.

**Attachment to Communications Lines:** Attachment to communications facilities conforming to the specifications above is via the appropriate IBM Line Adapter(s) for the type(s) of communications service being used... see "Special Features" below.

**Customer Responsibilities:** See M 2700 pages.

**PREREQUISITES:**

**Attachment to 2025** -- attachment is made via the Integrated Communications Attachment (#4580) on a per line basis to EIA Start/Stop Data Adapter(s) -- see 2025. NOTE: In a S/360 mld 25, attachment can also be made via a 2702 or 2703... see below.

**Attachment to 3135, 3135-3, 3138** -- attachment is made via the Integrated Communications Adapter (#4640) on a per line basis, to a Terminal Adapter Type I Model I (#9721-9728) ... see 3135, 3135-3, 3138. LIMITATION: Only IBM Line Adapter (#4794) is supported... see "Special Features" below.

**Bibliography:** S/360 -- GC20-0360, S/370 -- GC20-0001

**Specify:** [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 or #9504 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Line Assignments: Must be specified on 2711 Line Assignment Form (120-1458).


**Prices:**

<table>
<thead>
<tr>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2711</td>
<td>1</td>
<td>$145</td>
</tr>
</tbody>
</table>

**Plan Offering:** Plan B: Purchase Option: 50% Maintenance: B: Warranty B: Per Call: 3

**Limitations:** Up to thirty-two of the IBM Line Adapters below, in any combination, can be installed... operation with 1030 or 2741... with Interrupt (#4708) is limited to the 4-wire versions of the leased line adapter (#4647) or shared line adapters (#4691, 4692, 4693 or 4694).

**SPECIAL FEATURES**

**IBM LINE ADAPTER (#4790).** A modem for 2-wire limited distance use (up to 8 wire-miles). Line turnaround time is approximately 12 ms... see Limited Distance Line Adapter, Type 2 in SRL GA24-3435* for specifications and restrictions. For operation with similarly equipped 1030/1050/1060/1070 systems and 2740/2741 terminals at speeds up to 600 bps. Limitations: See below. Prerequisite: An available position in the basic unit or in a Line Adapter Module (#4794).

**IBM LINE ADAPTER (#4639 for 2-wire, #4647 for 4-wire).** A modem for leased common carrier or privately owned voice grade facilities. Line turnaround time is approximately 200 ms... see Leased Line Adapter in SRL GA24-3435* for specifications and restrictions. For operation with similarly equipped 1030/1050 systems and 2740/2741 terminals at speeds up to 135.4 bps. When used, a single leased telephone line can provide up to four independent 135.4 bps "subchannels"... see Leased Line Adapter installation practices in SRL GA24-3435*.

**IBM LINE ADAPTER (#4641-4644 for 2-wire, #4691-4694 for 4-wire).** A modem for shared use of a leased common carrier or privately owned voice grade facility. Line turnaround time is approximately 200 ms... see Leased Line Adapter installation practices in SRL GA24-3435*.

**IBM Linear Adapter Module (#4794).** For attachment of up to four additional IBM Line Adapters... any of those above, in any combination. Maximum: Seven.

**IBM LINE ADAPTER 4/1 TERMINATOR (#6350).** A pluggable device for physically attaching up to four different 2-wire IBM shared line adapters (#4641-4644) or up to four different 4-wire IBM shared line adapters (#4691-4694) to a single 408 Tele- phone Co. line terminating jack... see Leased Line Adapter installation practices in SRL GA24-3435*.

**MAC/ MRC/ Purchase/ MMMC/ FIC**

**IBM Line Adapter**

**Limited Distance** #4790 $10 $506 $50 39

**Leased Line, 2-wire** #4639 10 448 1.00 39

**Leased Line, 4-wire** #4647 10 448 1.00 49

**Shared Line, 2-wire subchannel 1** #4641 21 899 1.50 39

**subchannel 2** #4642 21 899 1.50 39

**subchannel 3** #4643 21 899 1.50 39

**subchannel 4** #4644 21 899 1.50 39

**Shared Line, 4-wire subchannel 1** #4691 21 899 1.50 39

**subchannel 2** #4692 21 899 1.50 39

**subchannel 3** #4693 21 899 1.50 39

**subchannel 4** #4694 21 899 1.50 39

**Line Adapter Module** #4794 5 538 2.00 28

**Shared Line Adapter 4/1 Terminator** #6350 5 168 50 19

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* SRL GA24-3435-2 or subsequent revisions.

† For further information on IBM Line Adapters, see M 2700 pages.
2715 TRANSMISSION CONTROL UNIT
[no longer available]

The following specifications can be changed in the field.

**Specify:**
1. Voltage (AC, 3-phase, 4-wire, 60 Hz, locking plug): 
   - #9874 for 208 V, or #9096 for 230 V.
2. Color: 
   - #9041 for red, #9042 for yellow, #9043 for blue, 
   - #9045 for gray, or #9046 for white.
3. Cabling: 
   - #9080 for below floor, or #9081 on floor.
4. When Extended Distance Repeater, Receive or Send (#3874, 3875) is ordered, 
   - #9486 must be specified for 2715s having serial no. 10071 or below.
5. If any Extended Distance Repeater, Receive or Send (#3874, 3875) features are used in the 2790 system, 
   - #9548 (oscillator change) must be specified on each 2791 mdl 1 or 2 or 2793 in the system. See feature description under 2791 or 2793 for prerequisites.

**PRICES:**

- **MAC/ MRC:**
  - 2715: 1, $1,740; 2, 1,740
  - 2715: 2, $67,240; 221

- **Plan Offering:**
  - Plan A. Additional Use Charge Rate: 10%
  - Plan B. Per Call: 2

- **Metering:**
  - I/O Unit (Online/Offline)

- **Warranty:**
  - B

**SPECIAL FEATURES**

The following special features are on an "as available" basis for field installation.

**DUAL COMMUNICATION INTERFACE** (#3460).

- **Model 2 only**
  - Provides a switched interface which allows the BSC adapter to be manually switched between two types of communications lines for back-up purposes.
  - Maximum: One. Limitation: This feature does not provide the capability to operate two lines simultaneously.

**EXPANDED CAPABILITY** (#3801).

- Provides the system with an additional 16K of control storage for a system total of 32K.
- Required for a maximum device configuration on a 2715, for control of the External Alarm Contacts (#3690) feature on attached 2791/2793 Area Stations, 2798 Guidance Display Units, or 2792 Remote Communications Controllers, and for message routing independent of host CPU Intervention. Maximum: One.

**EXTENDED DISTANCE REPEATER, RECEIVE** (#3874).

- Provides for operation with a 2791 or 2793 Area Station equipped with Extended Distance Repeater, Send (#3875) located up to 6,000 wire-feet away. See Physical Planning Manual, GA27-3017, for cable specifications. Maximum: Four. Limitations: See "Limitations" for Extended Distance Repeater, Send (#3875) below. Prerequisites: Extended Distance Repeater, Send (#3875) on the "up-line" 2791/2793. Also see "Specify" [4] and [5].

**EXTENDED DISTANCE REPEATER, SEND** (#3875).

- Provides for operation with a 2791/2793 Area Station equipped with Extended Distance Repeater, Receive (#3874) located up to 6,000 wire-feet away. See Physical Planning Manual, GA27-3017, for cable specifications. Maximum: Four. Limitations: [1] The use of two pairs of Extended Distance Repeaters, Receive/Send (#3874, 3875) in tandem is not recommended. If the Area Station having both Receive and Send Repeater features should fail, the entire segment would be inactive. [2] Maximum of eight pairs per transmission line attached to the 2715. Maximum of two pairs may be used on a secondary loop attached to a 2792. [3] In the 2715, each of the four segments may include (a) EDR, Send (#3875) only, or, (b) EDR, Send (#3875) and EDR, Receive (#3874); EDR, Receive (#3874) only is not available. Prerequisites: Extended Distance Repeater, Receive (#3874) on the "down-line" 2791/2793. Also see "Specify" [4] and [5].

**LINE TRANSFER SWITCH** (#4750).

- To manually switch the 2790 transmission lines between two adjacent 2715s acting as back-up for each other. All terminals must be defined identically in the user tables of both 2715s affected. Limitation: When switching from one system to another, the total number of terminals allowed cannot exceed the maximum number allowable on one 2715. Maximum: One. Note: This feature is required on only one of the two 2715s.

**LINE TRANSFER SWITCH - THIRD UNIT** (#4751).

- To use a third 2715 as back-up for either of two other 2715s. All terminals must be defined identically in the user tables of both 2715s affected. Limitation: When switching from one system to another, the total number of terminals allowed cannot exceed the maximum number allowable on one 2715. Maximum: One. Prerequisites: The two primary 2715s must each be equipped with Line Transfer Switch (#4750) ... the third (back-up) 2715 requires only #4751.

**LOCAL 2740 ADAPTER** (#4850).

- This 2715 is not to be reproduced without written permission.
**Purpose:** A Selectric® typewriter terminal (printer/keyboard) for transmission of data or text to or from another terminal or data processing system.

**NOTE:** For possible use with Series/1, see GSD manual.

**Model 1**

Keyboard/printer terminal for transmission to or from another 2740 mdl, or to or from a S/360 mdl 22 thru 85, 195, or any S/370 or 4300 Processor ... see “Communications Facilities” and “Prerequisites” below. Also attaches directly to a 2715 Transmission Control for keyboard input or printed output ... see “Prerequisites” below.

**Model 2**

Buffer keyboard/printer terminal for transmission to or from a S/360 mdl 22 thru 85, 195, or any S/370 or 4300 Processor ... see “Communications Facilities” and “Prerequisites” below.

**Model Changes:** Cannot be made in the field.

**Highlights:** The unit’s Selectric typewriter provides the optimum in operator/machine relationship. Special features available permit tailoring of terminals to the requirements of a specific work station. System control keys and indicator lights, located conveniently alongside the keyboard, make it a compact console-like unit. When not used for data transmission, the typewriter may be used for office typing. **NOTE:** There are basic design differences in the 2740 which will result in a different printing output than the Selectric typewriter. Customers with applications requiring critical printing must be directed to evaluate 2740 output capability in light of their own needs.

**Model 1**

1. code and system capability permit transmission to or from other 2740 mdl, or to a suitably equipped S/360, S/370 or 4300 Processor ... see System Application under “Specify” below.

**Model 2**

2. code and system application permit transmission to or from a suitably equipped S/360, S/370 or 4300 Processor. The basic unit has a 120-position magnetic core buffer. Data entered from the keyboard can be stored and visually verified before transmission. Data from the S/360, S/370 or 4300 Processor is received directly by the printer, except when the unit is equipped with Buffer Receive (#1499) ... see “Special Features.” This model also includes the functions provided by Station Control (#7479) on the model 1.

**Communication Facilities:** Either model operates in half duplex mode over the following facilities at the speeds indicated. For information concerning the facilities, see the M 2700 pages.

**Model 1**

1. At 134.5 bps via facility C1, C2, D1, G1 or G2.
2. At 75 bps via facility A4.
3. At 134.5 bps via facility D1, G1 or G2.
4. At 600 bps via facility D2 or G2.

Note: For attachment to facility A4, the channels must be capable of 75 bps operation, use non-code sensitive regenerators and a 9-bit character code, and be terminated in a 62.5 ma neutral DC loop of the terminal. Also see Data Set Attachment under “Specify” for required facility specification code. On appropriate lines, IBM Line Adapters may be used in lieu of data sets ... see “Special Features.” IBM Line Adapters and line sets cannot be mixed on the same circuit.

**PREREQUISITES:**

Attachment to a 2715 Transmission Control Unit (mdl 1 only) -- requires a 2715 mdl 2 or a 2715 mdl 1 equipped with a Local 2740 Adapter (#4850) ... 2715 Attachment (#9715) is also required on the 2740 mdl 1 itself. See “Specify” below.

Communication with another 2740 (mdl 1 only) -- System Application (#9701) is required on each 2740 ... in addition, the same Data Attachment is required on each 2740. See “Specify” below.

Communication with a S/360 mdl 25 -- via the Integrated Communications Attachment (#4580) with appropriate features on the 2025 ... see “Special Features” under 2025. **NOTE:** Communication with a S/360 mdl 25 may also be via a 2701, 2702 or 2703.

Communication with a S/370 mdl 115, 125, 135, 135-3, 138 -- via the allocated Communications Adapter (#4640) to the 3125, 3135, 3135-3, 3138. Also, a 2701, 2702, 2703, 3704 or 3705 can be used ... see below.

Communication with a S/360 mdl 22 thru 85, 195 or any S/370 Processor -- via a 2701 Data Adapter Unit or 2702/2703 Transmission Control equipped with appropriate features ... see 2701, 2702, 2703.

**Communication with a S/360 mdl 30 thru 195 (except models 46, 47, 555 Mode, 85 or 91), or any S/370 Processor -- via a 3704 or 3705 Communications Controller. **NOTE:** See 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

**Communication with a 4300 Processor -- via a 2701, 3704 or 3705 to all 4300 Processors and via the Communications Adapter feature on the 4300. See 2701, 3704, 3705, 4331 and 4341 pages for details and prerequisites.

**Customer Responsibilities:** See M 2700 pages.

**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.

**Specify:** [1] Voltage (A1, 1-phase, 3-wire, 60 Hz): Locking plug -- #9680 for 115 V, #9684 for 208 V, or #9686 for 230 V. Non-lock plug -- #9861 for 115 V, #9865 for 208 V, or #9867 for 230 V. If a 2740 is to be installed on a raised floor, specify Moisture Proof Plug -- #9902 for 208 V, or #9904 for 230 V.

**NOTE:** Considerations must be made independently of CPU voltage and should be specified only after checking available voltage at terminal location.

[2] Printing Element: One element is supplied ... see ‘Type Catalog’ page TC 21, etc., for available PTTC/BCD, OPD Selectric elements available, feature #s, and prices of additional elements. The element specified determines the keyboard arrangement. [NOTE: The byte structure of the standard OPD Selectric character set differs from that for PTTC/BCD or PTTC/EBCD character sets. The 2740 mdl 1 or 2 is not type I programming supported on S/360 with any standard OPD Selectric elements. Standard OPD Selectric elements are not available for the 2740 mdl 2.]

**Character Spacing:** #9104 for 10 characters/inch, or #9105 for 12 characters/inch. [NOTE: #9105 is not recommended unless a 12-pitch element is specified ... intermixing of character spacing on terminals in any one system should be avoided ... character spacing cannot be changed in the field.]

**Line Feeding:** #9435 for 6 lines/inch, or #9436 for 8 lines/inch. If a Pin Feed Platen is desired in lieu of the standard friction feed platen, see “Special Features” below. #9435 or #9436 must be specified even though a Pin Feed Platen is ordered.

**Data Set Attachment:** Unless an IBM Line Adapter, Telegraph Line Attachment (#7807), or 2715 Attachment (#9715) is specified, one of the following must be specified, depending upon the facility to be used:

1. #9114 -- [mdl 1 only] for facility C1 or C2. PREREQUISITE: Dial Up (#3255) ... see “Special Features.”

2. #9115, #9116 or #9120 for facility D1. See this facility in the M 2700 pages for applicability of these codes.

3. #9121 -- for facility D2. PREREQUISITE: Speed Base - 600 BPS (#7105) ... see “Special Features.”

See M 2700 pages for information on these communication facilities.

**System Application (mdl 1 only):** #9700 for terminal-to-multiplexer system (except 2715), or #9701 for terminal-to-terminal.

7. 2715 Attachment (mdl 1 only): #9715 ... required for attachment to a 2715. PREREQUISITE: Dial Up (#3255) and Print Element (#9592). Cable for the 2740 must be ordered on the 2715 Cable Order Form. LIMITATION: When attached to a 2715, Dial Up (#3255) is the only special feature that can be installed on the 2740.

**PRICES:**

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Plan Offering: Plan B

Purchasing Option: 40%: Maintenance: B

Warranty: B: Per Call: 1

**SPECIAL FEATURES**

* For Either Model

† IBM LINE ADAPTER (#4634 for 2-wire, #4635 for 4-wire). A modem for local use up to 4.75 wire-miles over facility G1. See Limited Distance Line Adapter, Type 1 in SRL G42-3435** for specifications and restrictions. **NOTE:** Operation with a 2712 Remote Multiplexer requires #4635.

† IBM LINE ADAPTER (#4639 for 2-wire, #4647 for 4-wire). A modem for leased or privately owned voice grade use (facility D1 or B). See Leased Line Adapter in SRL G42-3435** for specifications or equivalent.

**SRL G42-3435-2 or subsequent revisions.

† For further information, see M 2700 pages.
2740 Communications Terminal (cont'd)

Conclusions and restrictions. Limitation: For point-to-point terminal-to-multiplexer operation, #4647 cannot be used on the 2740 mdl 1 when the multiplexer is operated in continuous carrier mode.

1. IBM LINE ADAPTER (#4641-4644 for 2-wire, #4691-4694 for 4-wire). A modem for shared use of a type 3002 Private Line Service* or privately owned voice grade facility (facility D1). See Shared Line Adapter in SRL GA24-3435** for specifications, use and restrictions. When used, a single voice grade line can accommodate up to four independent "subchannels" -- the equivalent of up to four independent low-speed lines from a single voice grade line. Each "subchannel" operates on a separate frequency and simultaneously data flow is possible on all four "subchannels", either on a point-to-point or multipoint basis.

2. For subchannel 1: #4641 for subchannel 1 #4642 -- for subchannel 2 #4643 -- for subchannel 3 #4644 -- for subchannel 4

3. For subchannel 4: #4691 -- for subchannel 1 #4692 -- for subchannel 2 #4693 -- for subchannel 3 #4694 -- for subchannel 4

Maximum: One per 2740. Prerequisite: All units excepted to communicate directly with each other must be on the same "subchannel" i.e., must be equipped with the same shared line adapter. Exception: It is recommended that all "subchannels" be paired with the same "subchannel" i.e., must be equipped with the same shared line adapter. Exception: It is recommended that all "subchannels" be paired with the same voice grade line.

** SRL GA24-3435-2 or subsequent revisions.

IBM LINE ADAPTER (#4790). A modem for 2-wire limited distance use up to 600 bps at speeds of 600 bps limited distance use. G2. See Limited Distance Line Adapter, Type 2B, in SRL GA24-3435** for specifications and restrictions.

Pin Feed Platen (#9509). [Purchase only] For Plant Installation -- specify #9509 for maximum one, in lieu of standard friction feed platen. "Pin Feed Platen" on M 10000 pages. One, #9509 and #9692 be used. Limitation: Cannot be used on the 2740 mdl 1 when the multiplexer is operated in continuous carrier mode.

1. IBM LINE ADAPTER (#4790). A modem for 2-wire limited distance use up to 500 bps at speeds of 600 bps limited distance use. G2. See Limited Distance Line Adapter, Type 2B, in SRL GA24-3435** for specifications and restrictions.

Pin Feed Platen (#9509). [Purchase only] For Plant Installation -- specify #9509 for maximum one, in lieu of standard friction feed platen. "Pin Feed Platen" on M 10000 pages. Limitation: Cannot be used on the 2740 mdl 1 when the multiplexer is operated in continuous carrier mode.

2. IBM LINE ADAPTER (#4790). A modem for 2-wire limited distance use up to 600 bps at speeds of 600 bps limited distance use. G2. See Limited Distance Line Adapter, Type 2B, in SRL GA24-3435** for specifications and restrictions.

Pin Feed Platen (#9509). [Purchase only] For Plant Installation -- specify #9509 for maximum one, in lieu of standard friction feed platen. "Pin Feed Platen" on M 10000 pages. Limitation: Cannot be used on the 2740 mdl 1 when the multiplexer is operated in continuous carrier mode.

2. IBM LINE ADAPTER (#4790). A modem for 2-wire limited distance use up to 600 bps at speeds of 600 bps limited distance use. G2. See Limited Distance Line Adapter, Type 2B, in SRL GA24-3435** for specifications and restrictions.

Pin Feed Platen (#9509). [Purchase only] For Plant Installation -- specify #9509 for maximum one, in lieu of standard friction feed platen. "Pin Feed Platen" on M 10000 pages. Limitation: Cannot be used on the 2740 mdl 1 when the multiplexer is operated in continuous carrier mode.

Automatic EOB (#1313). Provides an automatic EOB (End Of Block) code following the carriage return code upon depression of the carriage return key. Prerequisite: Record Checking (#6114).

Dial Up (#3255). Required when a dial data set is used, i.e., when Data Set Attachment. (#9114) is specified. Limitation: Cannot be used with Station Control (#7479).

Station Control (#7479). Gives the terminals the ability to react to a poll or address from a multiplexer. The polling scheme employs a "leader + space" pattern of "leader + address" character. The addressing sequence is identified by the "start of address" (comma) character. Prerequisite: Cannot be used with Dial Up (#3255) or 2760 Attachment (#3830). Limitation: Cannot be used with 2760 Attachment (#3830).

Transmit Control (#8028). Gives the terminal the ability to respond to a 2-character control code sequence from a multiplexer and to switch from a standby condition to a transmit condition. Prerequisite: Dial Up (#3255).

2760 Attachment (#3830). To attach a 2760 Optical Image Unit. A PTC/BCD or PTTC/EBDC Data Unit 1 or Data 2 type font printing element must be specified with this feature. See "Type Catalog", page 23, for feature #s. Limitations: Can be field installed only on units serial No. 15000 or above ... cannot be installed with Station Control (#7479) or Transmit Control (#8028). Prerequisite: Record Checking (#6114).

For Model 2 Only

Buffer Expansion (#1495, 1496). To increase the capacity of the basic 120-position magnetic core buffer. #1495 -- for positions 121 to 248 ... #1496 -- for positions 249 to 440. Prerequisite: #1495 requires #1495.

Buffer Receive (#1499). Permits data to enter the buffer from the communication line in lieu of going directly to the printer. Incoming data is stored until an EOT is received ... terminal then automatically goes to a receive buffer print state and prints out the contents of the buffer.

Document Insertion (#3401, 3402). [Plant installation only] For insertion of single part ledger cards in front of the typewriter platen without manual feeding. See SRL GA24-3434 for details on portions of ledger cards which cannot be used for printing. Manual positioning is required for each new print line. Includes controls for a Split Friction Feed Platen (#9509). Maximum: One, #3401 or #3402. Limitation: Pin Feed Platen (#9509) cannot be used if this feature is installed.

* For further information, see M 2700 pages.
2740 COMMUNICATIONS TERMINAL

Purpose: A Selectric typewriter terminal to satisfy special system applications that require one-terminal-per-line operation.

Highlights: Looks like and includes the optimum operator/machine relationship of the standard Selectric typewriter. The only terminal controls located in the keyboard area are the “On/Off” switch and “Attention” key. Mounted on a stand similar to that of the 2740. The typewriter may be used for office typing when not used for data transmission. [NOTE: There are basic design differences in the 2741 which will result in different printing output than the Selectric typewriter. Customers with applications requiring critical printing must be directed to evaluate 2741 output capability in light of their own needs.

Code and systems compatibility provide for transmission to and from a suitably equipped S/360 mod 22 thru 85, 195, any S/370 Processor except the 3115, or any 4390 Processor. The 2741 can attach to a 3790 system via a 3792 Auxiliary Control Unit. The 2741 can attach to an 8100 Information System via the communications capacity of the 8101, 8130 or 8140. See “PREREQUISITES” below.

Communications Facilities: The 2741 operates in half-duplex mode over the following facilities. For information concerning these facilities, see M 2700 pages.

At 134.5 bps via facilities C1, C2, D1, G1 or G2.
Also see Data Set Attachment under “Specify” for required facility specification code. On appropriate lines, IBM Line Adapters may be used in lieu of data sets ... see “Special Features.” IBM Line Adapters and data sets cannot be mixed on the same circuit.

PREREQUISITES:

Communication with a S/360 mod 25 -- via the Integrated Communications Attachment (#4560) with appropriate features on the 2025. Communication with the S/360 mod 25 may also be via a 2701, 2702 or 2703.

Communication with a S/370 mod 115, 125, 135, 135-3, 138 -- via the Integrated Communications Adapter (#4640) on the 3115, 3125, 3135, 3135-3 or 3138. Also a 2701, 2702, 2703, 3704 or 3705 can be used ... see below.

Communication with a S/360 mod 22 thru 85, 195, or any S/370 Processor -- via a 2701 Data Adapter Unit, or 2702/2703 Transmission Control equipped with appropriate features ... see 2701, 2702, 2703.

Communication with a S/360 mod 30 thru 195 (except mod 44, 47 in TSS Mode, 85 or 91), or any S/370 Processor -- via a 3704 or 3705 Communications Controller. NOTE: See the 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

Communication with a 4330 Processor -- via a 2701, 3704 or 3705 to all 4300 Processors and via the Communications Adapter on the 3331. See 2701, 3704, 3705, 3431 and 4341 pages for details and prerequisites.

Communication with a 3792 Auxiliary Control Unit -- via an IBM Leased Line Adapter (#5400) or EIA Interface (#3701) on the 3792.

Communication with an 8100 Information System -- via Communications Adapter with Clock - BSC/SS (#1603) and EIA Interface (#3701) in the 8101, 8130 or 8140.

Customer Responsibilities: See M 2700 pages.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage: (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V. If a 2741 is to be installed on a raised floor, specify Moisture Proof Plug -- #9902 for 208 V, or #9904 for 230 V. [NOTE: Consideration of voltage must be made independently of CPU voltage and should be specified only after checking available voltage at terminal location.]

[2] Printing Element: One element is supplied ... see “Type Catalog” page TC 21 etc for available PTTC/BCD, PTTC/BCD and standard OPD in Selectric elements available, feature #s, and prices of additional elements. The element specified determines the keyboard arrangement. [NOTE: The

* or equivalent
** SRL GA24-3435-2 or subsequent revisions.
† For further information, see M 2700 pages.
‡ Only these specify codes and special features are supported by the 3790 system.

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2741 Communications Terminal (cont'd)

byte structure of the standard OPD Selectric character set differs from that for PTTC/BCD or PTTC/EBCD character sets.

[3] Character Spacing: #9104 for 10 characters/inch, or #9105 for 12 characters/inch. [NOTE: #9106 is not recommended unless a 12-pitch element is specified ... intermixing of character spacing on terminals in any one system should be avoided ... character spacing cannot be changed in the field.]

[4] Line Feeding: #9435 for 6 lines/inch, or #9436 for 8 lines/inch. If a Pin Feed Platen is desired in lieu of the standard friction feed platen, see "Special Features" below. #9435 or #436 must be specified even though a Pin Feed Platen is ordered.

[5] Data Set Attachment: Unless an IBM Line Adapter is specified, one of the following #s must be specified, depending upon the facility to be used:

- #9114 -- for facility C1 or C2. PREREQUISITE: Dial Up (#3255). See "Special Features."
- #9115, #9116 or #9120 -- for facility D1M. See the D1M facility in the M 2700 pages for the applicability of these codes.

See M 2700 pages for information on these communication facilities.

**Special Features**

DIAL UP (#3255). Required when a dial data set is used, i.e., when Data Set Attachment (#9114) is specified.

INTERRUPT, RECEIVE (#4708), TRANSMIT (#7900). Either can be used with any of the communication facilities listed above. Receive Interrupt (#4708) -- used to interrupt transmission from the processor at the operator's convenience.

Transmit Interrupt (#7900) -- allows the processor to interrupt transmission from the 2741.

**IBM LINE ADAPTER** for 2-wire, #4634 for 4-wire. A modem for local use up to 4.75 wire-miles over facility G1. See Limited Distance Adapter, Type 1 in SRL GA24-3435** for specifications and restrictions. Note: Operation with a 2712 Remote Multiplexer requires #4635.

**IBM LINE ADAPTER** for 2-wire, #4647 for 4-wire. A modem for leased or privately owned voice grade use (facility D1). See Leased Line Adapter in SRL GA24-3435** for specifications and restrictions.

**IBM LINE ADAPTER** for 2-wire, #4691 for 4-wire. A modem for shared use of a type 3002 Private Line Service** or privately owned voice grade facility (facility D1). See Shared Line Adapter in SRL GA24-3435** for specifications, use and restrictions. When used, a single voice grade line can provide up to four independent "subchannels" ... the equivalent of up to four independent low-speed lines from a single voice grade line. Each "subchannel" operates on a separate frequency and simultaneous data flow is possible on all four "subchannels."

2-wire #4641 -- for subchannel 1 #4643 -- for subchannel 2 #4645 -- for subchannel 3 #4647 -- for subchannel 4
4-wire #4691 -- for subchannel 1 #4693 -- for subchannel 2 #4695 -- for subchannel 3 #4697 -- for subchannel 4

Maximum: One per 2741. Prerequisites: The multiplexer with which the 2741 is to communicate must be equipped with the same "subchannel" feature ... it is recommended that if no more than two "subchannels" are required on a line facility, that #4641 and #4642, or #4691 and #4692, be used.

**IBM LINE ADAPTER** (#4790). A modem for 2-wire limited distance use up to 6 wire-miles over facility G2. See Limited Distance Line Adapter, Type 2 in SRL GA24-3435** for specifications and restrictions.

---

**PIN FEED PLATEN** (#9509). [Purchase only] For Plant Installation -- specify #9509 ... maximum, one, in lieu of standard friction feed platen. See "Pin Feed Platen(s)" on M 10000 pages for available options, feature #s to be specified and prices. For Field Installation -- to order add 1 platens or to order one for field installation.

**PRINT INHIBIT** (#5501). Allows the processing unit to inhibit the 2741 from printing transmitted or received data.

**TYPOMATIC KEYS** (#3841). Allows repeat action when key level is depressed to a lower level ... operations included are Hyphen/Underscore/Space and Backspace.

**Special Feature Prices**

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* or equivalent.
** SRL GA24-3435-2 or subsequent revisions.
† For further information, see M 2700 pages.
‡ Only these specify codes and special features are supported by the 3790 system.

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Purpose: An input/output station and local device data controller for a 2790 Data Communication System.

Model 1 For card, identification badge and 12-key manual entry ... available adapters provide for attachment of up to three 1035 Badge Readers, up to thirty-two 2795/2796/2797 Data Entry Units with a 2715, or System/7, up to twelve 2798 Guidance Display Units (2715 and System/7 only), and an OEM digital de­vice. See “Special Features” and ‘’2791/2793 Limitations” under 2793.

Model 2 For card, identification badge, and 12-key manual entry only.

Model Changes: Model 2 can be changed in the field to model 1, but not vice versa.

Prerequisites: The 2790 system controller can be a 2715 Trans­mission Control Unit, or a properly equipped System/7.

With 2715 See 2715 for details.

With System/7 See 2790 Control (#8195) under 5012 or 5013.

Highlights: A solid state, industrially packaged unit. It features data entry via pre-punched cards, identification badges, and 12­key manual entry ... display of data in response to an inquiry ... time-of­day display ... designed for attachment to a unique transmission line capable of handling large volumes of short messages from many stations.

Card Reader -- standard or Port-A-Punch® prepunched 80-column cards can be individually inserted and removed manually. An upper left corner cut card, C1, is required. M-3, M-4 and M-5 scores can be used. Numbers, letters and certain special char­acter card codes are read ... see SRL GA27-3015. Blank card columns are not recognized and are automatically skipped.

Badge Reader -- reads identification badges (22-column card size) and badges which are punched on a 13 Badge Punch, are individually inserted and removed manually. Badges with or without a pocket on the back can be used. They can be purchased from vendors or pro­duced by commercially available equipment. See SRL GA21-9028 for badge specifications. Note: A badge gauge is shipped at no charge with each badge punch ... see 13.

Manual Entry -- ten numeric and two special keys provide for entry of variable numeric source data. As each key is depressed, the number or special character is displayed to the operator for verification. Up to six positions are displayed for any one data field. After verification, an enter key is depressed to transmit the data to the system controller. The number of fields that may be entered is specified by the system controller program.

Digital Display -- when not being used for display of manual entry, time-of-day is displayed. Digital display may also be used for display of six digits of data in response to an inquiry.

Operator Guidance -- step-by-step instructions are provided to the operator for each transaction. The thirty-one guidance indicators are designed to permit the user’s own terminology. The indicators are activated under program control of the system controller.

Transaction Selection -- nine transaction and one release keys are provided. The transactions may be expanded by subsequent card, badge, or manual entry to provide a greater number of transactions.

Monitor Key -- used where a supervisor’s approval is required before a record can be transmitted ... one key is supplied.

Indicators -- advise the operator that: [1] The station is online and ready for use ... [2] The station is in process of transmitting a record ... [3] The record is not valid and the “Repeat Clear” button should be depressed ... [4] A card is in the card reader.

Control Keys -- the “Enter” key is used to transmit the manually keyed data ... the “Clear” key is used to reset the station to normal ready status ... the “Next Guidance” key is used to ad­vance the operator guidance when required for unusual transac­tions.

Attachment Features -- on the mdl 1, available features permit attachment of up to three 1035 Badge Readers, up to thirty-two 2795/2796/2797 Data Entry Units (any combination), or up to twelve 2798 Guidance Display Units (2715 and System/7 only), and one OEM digital device such as a scale, meter, or counter. See “Special Features.”

Customer Responsibilities: See 2790 in “Systems.”

Environment: See 2790 in “Systems.”

Limitations: See ’2791/2793 Limitations” following 2793.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz). #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Cable to Junction Box: #9030, if required. If initial machine order includes #3330, #7980, #8030 or #8295, or any combi­nation of these features, the shipper must be subse­quent to add any of these features must also specify #9030. Note: Do not specify #9030 on mechanical replacement orders. See Physical Planning Manual GA27-3017 for require­ment. Note: If #9030 is specified, provide complete person’s name and address for shipment ... cables will be shipped auto­matically, prior to scheduled delivery.

[4] For initial 2791 machine order having Extended Distance Re­peater, Receive or Send (#3874, 3875), specify #9547 and #9548 ... also specify #9548 (oscillator) for each 2791 ordered under 2793.

[5] If a 2792 Remote Communications Controller is used in the 2790 system, specify #9790 for each 2791 mdl 1 or 2 attached to the 2792 mdl 2 on the second “loop.”

PRICES: Mdl MAC/MRC Purchase MMMC

$205 $7,140 $56.50

$151 $5,890

Plan Offering: Plan B Purchase Option: 40% Warranty: B Useful Life Category: 2 Per Call: 1

SPECIAL FEATURES

DIGITAL DEVICE READ-IN (#3330). [Mdl 1 only] For attachment of an OEM digital device such as a scale, meter, or counter via a customer-supplied junction box and cable ... reads up to ten decimal digits. Electrical resistance of OEM device and cable is limited to 10 ohms ... OEM device must comply with the 2791 interface ... see “Specify” [3] above. Maximum: One.

EXTERNAL ALARM CONTACTS (#3690). [Mdl 1 only] Provides a pair of dry contacts which can be momentarily (35 milliseconds nominal) closed to allow operation of a customer’s attached external alarm device (bell, whistle, light, etc.). Momentary closure of the contacts is activated by receipt of an EBCDC “Bell” char­acter. The contacts are capable of switching 115 V AC or DC at no more than 0.5 amperes. Maximum: One. Note: Includes a 4-foot, 2-wire cable for attachment of a customer-provided alarm or junc­tion box. Limitation: Not available when System/7 is the system controller. Prerequisites: 1053 Attachment (#6050) on the 2791 and Expanded Capability (#3801) on the 2715 controller.

EXTENDED DISTANCE REPEATER, RECEIVE (#3874). Provides for operation with another 2791 or 2793 Area Station or 2715 Transmission Control Unit equipped with Extended Distance Re­peater. Send (#3875) located up to 10,000 feet away. See Physical Planning Manual GA27-3017 for cable specifications. Maximum: One. Limitations: See Limitations for Extended Dis­tance Repeater, Send below. Field installable on units shipped prior to October 2, 1971 which also include B/M 5992893 and all units shipped after October 1, 1971. B/M 5992965 is plant in­stallable only. Note: #3874 is added anywhere in the 2790 system an MES, #9548 (oscillator change) must be ordered for each 2791 or 2793 ordered for the system. Prerequisite: Extended Distance Repeater, Send (#3875) on the “up-line” 2791, 2793 or 2715.

EXTENDED DISTANCE REPEATER, SEND (#3875). Provides for operation with another 2791 or 2793 Area Station or 2715 Trans­mission Control Unit equipped with Extended Distance Repea­ter. Receive (#3874) located up to 6,000 wire-feet away. See Physi­cal Planning Manual GA27-3017 for cable specifications. Maximum: One. Limitations: [1] The use of two pairs of Extended Distance Repeaters, Receive/Send (#3874, 3875) in tandem is not recommended. If the Area Station having both Receive and Send repeaters should fail, the entire segment would be inactive ... [2] When an System/7 is the 2790 System controller, these repe­aters cannot be used between the system controller and the first Area Station or between the last Area Station and the system controller. However, they can be used between all other Area Stations attached to the system within the maximum limit ... [3] Maximum of eight pairs per 2715, or System/7. Maximum of two pairs of EDRs may be used on a secondary loop attached to a 2792. Field installable on units shipped prior to October 2, 1971 which include B/M 5992893 and all units shipped after Octo­ber 1, 1971. B/M 5992893 is plant installable only when #3875 is added anywhere in the 2790 system, an MES, #9548 (oscillator change) must be ordered for each 2791 or 2793 or­dered for the system. Prerequisite: Extended Distance Repea­ter, Receive (#3874) on the “down-line” 2791, 2793 or 2715.

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### 2792 REMOTE COMMUNICATIONS CONTROLLER

**Purpose:** For 2790 Data Communication System ... controls exchange of data between the 2790 System Controller and remote 2790 terminals via common carrier leased communication facilities.  
**Model 1** Attaches to the 2790 System Controller (via the "loop") and directly to the local termination of the common carrier facilities.  
**Model 2** Attaches directly to the remote termination of the common carrier facilities and up to fifteen 2791/2793 Area Stations (via a secondary "loop").  
Both a Model 1 and Model 2, operating point-to-point with one another on the common carrier facilities are required to attach each group of up to fifteen Area Stations.  
**Model Changes:** Available at time of manufacture only.  
**Highlights:** For 2790 Systems in which 2790 terminals are inaccessible to the System Controller via in-house wiring, viz., across a thoroughfare, across the city, or in another city; the 2792s enable exchange of data via common carrier leased communication facilities.  
**Terminal Devices:** Each pair of 2792s establishes a secondary communications loop at the remote location to which can be attached up to fifteen 2791/2793 Area Stations with their associated 2795/2796/2797 Data Entry Units, 2798 Guidance Display Units, Production Monitoring Pulse Count (#5550), and other related features ... see 2715 "Maximum Configurations."

**Communication Facilities:** Between the 2792 md1 and 2792 md2, the communications facilities must be a leased four-wire duplex channel, Type 3002 with C1 conditioning (or better), or privately owned equivalent. No data sets (modems) are required.  
If the communication facilities round-trip delays exceed 80 milliseconds, the 2792 cannot be used. If the communications route between the 2792s, md1 and md2, approximates 1,000 miles or more, or if the communication facilities round-trip delay is expected to approach 80 milliseconds, the customer should be advised to consult the common carrier to determine the expected communication facilities delay.

The 2792 md1 attaches to the 2715 or System/7 via the 2-wire high speed communications line, in the "loop," similar to the 2791/2793 Area Stations.  

2792/2793 Area Stations attach to the 2792 md2 2 via a 2-wire customer-provided high-speed communication line.  
Distances between Area Stations and the 2792 depend upon the characteristics of the line used (e.g., up to 1,000 wire-feet for 
#22 AWG). The Extended Distance Repeater feature cannot be installed on the 2792s. However, they can be installed in the attached Area Stations. See Physical Planning Manual, GA27-369.  
**Prerequisites:** [1] A 2715 Transmission Control Unit with Expanded Capability (#3801) or a System/7 with a 2790 Control (#8195 on 5012 or 5015) for the 2790 System Controller ... [2] Specify #9790 on each 2791 Area Station md1 or md2 on the secondary "loop". See "Specify" under 2791.  
**IBM FE Service:** To facilitate servicing of the 2790 terminals on the secondary "loop" by the IBM CE, a minimum of one 1053 Printer is required proximate to each 2792 md2. When System/7 is the 2790 System controller, IBM service requires the resident On-Line Diagnostics program ... see System/7 Programming.  
**Maximum Configuration:** Each 2792 md1 is set in the field to respond to its own address plus the address(es) of 1, 3, 7 or 15 of the Area Stations remotely attached or reserved for future attachment. The maximum number of Area Stations that can be locally attached to the 2790 System controller is reduced by the set number of addresses. The number of 2791/2792 md1/2793s is limited by the number of addresses available to the system controller; i.e., maximum of 100 addresses per 2715.  
See 2790 Configurator, SRL GA27-3021. Maximum eight pairs of 2792 md1 1s and 2s per 2715. Maximum of two pairs of Extended Distance Repeater (EDR) features may be used on a secondary "loop." When System/7 is the controller, the maximum number of 2792 md1 1s is two per "loop" or four per system.  
**Limitations:** [1] The system configuration and the delays encountered in the common carrier facilities can affect the waiting time at the remote 2790 terminals served by the 2792s.  
Graphs and formulas to assist the user in determining throughput will be found in SRL GA27-3015. Common carrier communication facilities round-trip delay cannot exceed 80 milliseconds.  
**Customer Responsibilities:** See 2790 in "Systems" and M 2700 pages.  
**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.  
**Specify:** Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

**PRICES:**  
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<td>$82.50</td>
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<tr>
<td>2</td>
<td>308</td>
<td>10,710</td>
<td>82.50</td>
</tr>
<tr>
<td>Plan Offering: Plan B</td>
<td>Purchase Option: 45% Maintenance: D</td>
<td>Per Call: 1</td>
<td></td>
</tr>
</tbody>
</table>
**2793 AREA STATION**

**Purpose:** A local device data controller for a 2790 Data Communication System.

**Prerequisites:** The 2790 system controller can be a 2716 Transmission Control Unit or a properly equipped System/7.

**With 2715** See 2715 for details.

**With System/7** For details see 2790 Control (#1915) under 7912.

**Highlights:** A solid state, industrially packaged unit. It controls data transfer between locally attached I/O units and the system controller. It is designed for attachment to a unique transmission line capable of handling large volumes of short messages from many stations.

The basic unit provides for attachment of up to eight 2795/2796/2797 Data Entry Units (any combination) ... available for a 2791 or 2793 ordered for the system.

**Prerequisite:** Extended Distance Repeater, Receive (#3574) on the "down-line" 2791, 2793 or 2715.

**PULSE COUNTERS, BASIC (#5550).** Provide necessary control circuits, an FE diagnostic counter for servicing all counters on the Area Station, and the first 7 pulse counters for customer attachment to his production pulsing points. Each counter may be used as an ACCUMULATOR or as a PRE-SET accumulator. Decimal counts to 99,999 may be handled at Area Station level before requiring overflow service from the system controller. Each counter has a unique address. Each counter has Overflow Interrupt and Counter Advance Test indicators.

**Maximum:** One. Additional counters are provided.

**Prerequisite:** #5551 and #5552 for a maximum of 63 counters per Area Station. Note: In the event of a power failure, all pulse counters so affected will reset to zero with a resultant loss of count. There are commercially available backup systems via which customers can elect to ensure power continuity, if they so choose. Customers should be advised of the exposure and assurance measures available to meet it. Also see Visual Read-out (#8710) below.

**Specify:** #9030 for shipment of a four-foot-cable and junction box for attachment of the counters. See "Specify" [3] above. Limitations: Counters can be 2798 Attachment, Basic (#7990) is used. See "Specify" [8] above. PULSE Counters, Additional (#5551) above.

PULSE COUNTERS, ADDITIONAL (#5551). Provides a group of 8 counters. See #5550 above for description of counter functions. Maximum: 6 groups. #5551 is used for the first three additional groups (total 31 counters); #5552 for additional groups 4, 5 and 6.

**PULSE COUNTER EXPANSION (#5552).** Provides a group of 8 counters (nos 32-39) and their necessary circuits and controls. See #5550 for description of counter functions. #5552 also provides controls for adding #5551 groups 4, 5 and 6. **Maximum:** One. **Specify:** #9030 for shipment of a group of 8 pulse counters so affected will reset to zero with a resultant loss of count. There are commercially available backup systems via which customers can elect to ensure power continuity, if they so choose. Customers should be advised of the exposure and assurance measures available to meet it. Also see Visual Read-out (#8710) below. PULSE COUNTERS, ADDITIONAL (#5551) above.

**2798 ATTACHMENT, BASIC (#7990).** For attachment of up to four 2798 Guidance Display Units. Maximum: One. **Limitations:** See "2791/2793 Limitations" below. Cannot be used if Pulse Counters, Field Installable Basic (#5550) is used. **Maximum:** Limited to a total of 31 counters. **Specify:** #5501 on the 2715.

**2798 ATTACHMENT, ADDITIONAL (#7991).** Each provides for attachment of up to four 2798 Guidance Display Units. **Maximum:** Three. **Limitations:** See "2791/2793 Limitations" below. **Specify:** #7990 Attachment, Basic (#7990). 2795/2796/2797 ATTACHMENT, ADDITIONAL (#8296). Each provides for attachment of up to eight add1 2795/2796/2797 Data Entry Units (any combination) ... cable provided by specified #8290 accommodations. Maximum: Limited to the system within the maximum limit. **Visual Read-out (#8710).** Provides a backup means for manual readout (inside the Area Station cover via coded display lights) of pulse counters if for some reason the Area Station is bypassed, or the system controller is unable to provide readout. This feature is dependent upon continuous power being supplied to the counters. Should power be lost, the counters reset to zero. See the "Note" under Pulse Counters, Basic (#5550) above. **Maximum:** One.

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2791/2793 LIMITATIONS

[1] When using a 2715 -- the maximum number of 2791/2793 Area Stations (any combination) is 100 ... the maximum number of 2795/2796/2797 Data Entry Units (any combination) is 64 ... the maximum number of 2796 Guidance Display Units is 256 ... the maximum number of Pulse Counters is 1,008.

When using 2792 Remote Communications Controllers with the 2715, the number of Area Stations that can be attached is reduced. Each 2792 mdl 1 is set in the field to respond to its own address plus the address(es) of 1, 3, 7, or 15 of the Area Stations remotely attached or reserved for future attachment. The maximum number of Area Stations that can be locally attached to the 2715 is reduced by the set number of addresses. The number of 2791s/2792s combined is 64 when using a 2715 -- the maximum number of 2795/2796/2797 Data Entry Units (any combination) is 256 per 2795/2796/2797 control feature or 256 per System/7. See 2795/2796/2797 Attachments and Positioning for System/7.-- External Alarm is not provided.

[2] One 2791 mdl 1 will accommodate: (a) Up to thirty-two 2795/2796/2797s (any combination) and up to twelve 2796s. In addition to the above combinations, up to three 1035s, and one OEM digital device can be attached.

[3] One 2793 will accommodate: Up to thirty-two 2795/2796/2797s (any combination) and up to sixteen 2796s, or (b) Up to thirty-two 2795/2796/2797s (any combination) and up to 63 Pulse Counters.

In addition to the above combinations, one 1053 mdl 1 can be attached.

[4] The permissible distance between Area Stations or between the Area Stations and the system controller depends upon the transmission line characteristics. For example: Without Extended Distance Repeater (#3874, 3875), using #22 AWG outside-type telephone cable, these units may be separated up to 1,000 wire-feet apart ... using #19 AWG cable, separation may be up to 1,750 wire-feet. With Extended Distance Repeaters, available on the 2791, 2793 and 2715, units may be separated up to 6,000 wire-feet apart. For cable specifications and other distances, see Physical Planning Manual, GA27-3017. See "Limitations" under Extended Distance Repeat, Send (#3875).

[5] Loop Delay -- System/7 -- 2790 performance is affected by delay on the local loop and must be considered when developing a configuration. Maximum loop configurations are determined by a formula for "loop delay" that will assist you in quickly determining the viability of the configuration you are considering. The following calculation should be used for each 5012/5013 module equipped with 2790 Control (#8195). The resultant figure (total usec) must not exceed 316 usec per 5012/5013.

**Extended Distance Repeater**

<table>
<thead>
<tr>
<th>Area Stations</th>
<th>2791</th>
</tr>
</thead>
<tbody>
<tr>
<td>2792 mdl 1</td>
<td>2793</td>
</tr>
<tr>
<td>Pulse Counters</td>
<td>1 x 17.6 usec =</td>
</tr>
<tr>
<td>Pairs (send/receive)</td>
<td>1000' increments of cable</td>
</tr>
<tr>
<td></td>
<td>2 x 0.3 usec =</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Total usec =</th>
</tr>
</thead>
</table>

For further information on loop delay, see Physical Planning Manual, GA27-3017.

2796 DATA ENTRY UNIT

Purpose: A data entry unit for a 2790 Data Communication System.

Prerequisite: A 2791 Area Station mdl 1 or 2793 Area Station equipped with an appropriate attachment feature ... see 2791 and 2793, or a 5013 equipped with RPQ #D 08249.

Highlights: A compact, industrially packaged reporting unit for use by one or two production workers at their stations. It features a unique reader that accepts either end of a punched card or an identification badge ... four ten-position code selection dials ... 4-position manual entry for quantitative data ... a monitor key ... a telephone jack. It attaches to a 2791 mdl 1 or 2793 or 5013 via a twisted pair cable. Transmission speed is 40 characters/second.

Card-Badge Reader -- reads up to ten numeric digits from either end of a punched card (columns 1-10, or 71-80) or from an identification badge. Data is read interchangeably, from a card or badge, into a given record. Cards and badges are inserted manually. For badge specifications, see SRL GA21-9026. Badges with attached pocket clips cannot be accommodated.

Code Selection -- four 10-position (0-9) rotary dials are used to identify various codes such as production status, services required, labor codes or operation, during execution of a production order.

Manual Entry -- a group of four rocker thumbwheel switches for entry of quantitative data.

Monitor Key -- a three position, key-operated switch permits supervisory control of specific transactions ... one key is supplied.

Telephone Jack -- for supervisor's use in communicating by voice with support groups ... requires a separate voice communication network ... will accommodate a sound powered telephone handset.

Customer Responsibilities -- The DP Marketing Representative must advise the customer that maintenance is provided as defined in ... 2797. The customer is responsible for: [1] Providing a central maintenance facility ... [2] Installation and removal of the unit from its operational location.

Limitations: See "2795/2796/2797 Limitations" following 2797.

Environment: See 2790 in "Systems."

Maintenance: See "2795/2796/2797 Maintenance" following 2797.

Bibliography: See KWIC Index, G320-1621, or specific system bibliography.

**PRICES:**

<table>
<thead>
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<tbody>
<tr>
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<td>$986</td>
<td>$7.50</td>
</tr>
</tbody>
</table>

*Rental Plan: B* Purchase Option: 45% Per Call: 1

Warranty: B Useful Life Category: 2

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Purpose: A data entry unit for a 2790 Data Communication System.

Prerequisite: A 2791 Area Station mdl 1 or 2793 Area Station equipped with an appropriate attachment feature ... see 2791 and 2793, or a 5013 equipped with RPQ

Highlights: A compact, industrially packaged reporting unit for use by production workers or other employees at their work stations. It features a unique reader that accepts either end of a punched card or an identification badge ... two 10-position code selection dials ... 10 keys for manual entry ... 6-position visual display of manual entry data for verification before transmission ... a monitor key digit "Enter" key to cause data transmission ... a telephone jack. It attaches to the 2791 mdl 1, 2793 or 5013 via a twisted pair cable. Transmission speed is 40 characters/second.

Card-Badge Reader -- reads up to ten numeric digits from either end of a punched card (columns 1-10, or 71-80) or from a punched identification badge. Data is read interchangeably, from a card or a badge, into a given record. Cards and badges are inserted manually. For badge specifications, see SRL GA21-9029. Badges with attached pocket clips cannot be accommodated.

Code Selection -- two 10-position (0-9) rotary dials are used to input codes for things such as status, names or service required during execution of a production order.

Manual Entry -- 10-key keyboard provides for entry of variable numeric data. As each key is pressed, the number is displayed to the operator for verification. Up to six positions are displayed per data field.

Visual Display -- a 6-position visual display in which digits shift from right to left as keyed. Each position can display any of ten characters, 0-9, and blank.

Monitor Key -- a 3-position, key-operated switch permits supervisory control over the validity of specific records ... one key is supplied.

Control Buttons -- the "Enter" button activates an electric powered unit to transmit to the system controller data read by the card-badge reader, codes selected by the rotary dials, data keyed and visually displayed, and the monitor key digit "Enter". The button is used to reset the visual display when an error is seen during operator verification.

Telephone Jack -- for supervisor's use in communicating by voice with a group card or from a network ... will accommodate a sound powered telephone handset.

Customer Responsibilities: The DP Marketing Representative must advise the customer that maintenance is provided as defined in "2795/2796/2797 Limitations" below. The customer is responsible for: [1] Providing a central maintenance facility ... [2] Installation and removal of the unit from its operational location.

Limitations: See "2795/2796/2797 Limitations" below.


Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

PRICES: Mdl \[MAC\] MRC Purchase MMMC
2797 1 $52 $1,990 $9.00

Plan Offering: Plan B Per Call: 1 Warranty: B
Purchase Option: 45% Useful Life Category: 2

2795/2796/2797 LIMITATIONS

[1] The 2795/2796/2797 Data Entry Units and 2798 Guidance Display Units may be attached up to 1,000 feet from the 2791 mdl 1 or 2793 Area Station or the 5013 Digital Input/Output Module. For cable specifications and other distances, see Physical Planning Manual, GA27-3017.

[2] See "2791/2793 Limitations" under 2793 or to DAPT for information on maximum combinations of Data Entry Units and other devices.

2795/2796/2797 MAINTENANCE

Installation of 2795s, 2796s and 2797s in the immediate work area precludes the acceptability of online repair due to loss of the terminal's use and interruption of the workers' production.

Maintenance of the Data Entry Units will be by hardware replacement as opposed to repair at the operational location. The customer will determine the failing unit and deliver the unit to the central maintenance facility located at his central site. At this facility, the customer engineer will repair and online test the Data Entry Unit. Installation of the units at the operational location is the customer's responsibility. To facilitate CE maintenance and checkout, the customer must provide a dedicated line termination in the central maintenance facility. This line would be wired to address CO of an Area Station. A printer (5026, 1053, 2741, etc.) must be located in the proximity of the maintenance facility.

Although the Data Entry Units of any one type are interchangeable, the customer may wish to replace the failing unit with spare for availability.

2798 GUIDANCE DISPLAY UNIT

Purpose: For the 2790 Data Communication System -- an alphanumeric keyboard, 16-position variable data display and 48 instruction operator guidance panel for interactive transaction via a 2715 Transmission Control Unit with a 5/360 or 5/370 Data Base, or with a System/7 as the 2790 system controller.

Prerequisite: A 2791 mdl 1 or 2793 Area Station equipped with an appropriate attachment feature ... see 2791 and 2793.

Highlights: A small, desk/bench mounted, self-contained, buffered, data entry and output unit for multi-step interactive transactions via a 2715 Transmission Control Unit or with a System/7 as the 2790 system controller ... packaged for industrial environment ... featuring a typewriter-style 56-character alphanumeric keyboard ... 8 control keys visually displayed ... a unique 48 character instruction operator guidance panel which can be customized by the user to suit his specific applications ... 6 operational indicators ... a monitor key ... and an ON/OFF switch. Each unit is attached to a 2791 mdl 1 or 2793 Area Station via a 4-wire user-provided cable (up to 1,000 feet-long).

Keyboard -- the 56 data keys include the 26 alphabetic, 10 numeric, 4 printer functions represented by symbols for tab, new line, line feed and space, 8 special characters and 8 functional keys (assignable by the user) ... the 8 control keys for functions such as Enter, Clear, Cancel, Backspace, Transaction-Lock and Unlock, Advance and Display-Inhibit.

Display -- for visual verification, prior to transmission, of any 16-character combination of the 56 characters entered from the keyboard ... response data or messages ... guidance expansion messages ... time-of-day, when not used for data, from the system controller.

Guidance Panel -- up to 16 customer defined instructions can be actuated at a time on the guidance panel by the system controller to display the operator step-by-step through transactions or for status information ... instructions are written on two removable overlays provided by the customer to suit his specific applications ... overlays are similar to those used on the 2781 Area Station ... three manual settings on each of the two panels provide for a total of 48 instructions or lines of information.

Operational Indicators -- advise the customer that: [1] The unit is 'online' and ready for use ... [2] A transaction is 'in-process' ... [3] The record is not valid, the 'Clear' button should be depressed and data re-entered ... [4] The 'transaction-selection' code must be entered ... [5] The 'transaction-lock' mode is in effect ... [6] The 'first step' of a multi-step transaction should be initiated.

Monitor Key -- a 2-position common key operated switch permits supervisory controls for specific applications.

ON/OFF Switch -- a power on-off switch.

Customer Responsibilities -- see 2790 in "Systems."

Environment -- See 2790 in "Systems."

Limitations: [1] Using #2 AWG inside-type telephone cable, 2798s may be attached up to 1,000 feet from the 2791 mdl 1 or 2793. See Physical Planning Manual, GA27-3017 for cable specifications and other distances ... [2] See "2791/2793 Limitations" under 2793 for maximum combinations of 2798s and other devices ... [3] 2798 attachment is not available when an 1800 System is the system controller.
2798 Guidance Display Unit (cont'd)

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

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Plan Offering: Plan B
Maintenance: B
Per Call: 1
Warranty: B
Purchase Option: 45%
Useful Life Category: 2

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Purpose: Control unit for 2401 (and/or 2402) Magnetic Tape Unit in a 5/360, S/370 or 4300 Processor. With an appropriate special feature, a 2803 mdl 2 can also control 2420 Magnetic Tape Units ... see Special Features.

Models

2803 Tape Control -- a single channel, read or write control unit to which up to eight tape drives can be attached.

Model 1 -- controls up to eight 800 bpi drives (2401/2402 mdls 1, 2 and 3).

Model 2 -- the basic unit controls up to eight 1600 bpi drives (2401/2402 mdls 4, 5, 6). With an appropriate special feature, it can also handle 800 bpi drives (2401/2402 mdls 1, 2 and 3) ... see Special Features. Another special feature permits attachment of 2420 mdl 5s and 7s (1600 bpi). See #7900 under "Special Features."

Model 3 -- controls up to eight 2410 mdl 8s only. The data conversion function is standard.

2804 Tape Control -- a two channel, simultaneous read-write control unit to which up to eight tape drives can be attached.

Model 1 -- controls up to eight 800 bpi drives (2401/2402 mdls 1, 2 and 3).

Model 2 -- the basic unit controls up to eight 1600 bpi drives (2401/2402 mdls 4, 5 and 6). With an appropriate special feature, it can also handle 800 bpi drives (2401/2402 mdls 1, 2 and 3) ... see Special Features.

Model 3 -- controls up to eight 2410 mdl 8s only.

Model Changes: Cannot be made in the field.

Highlights:

2803 -- can be used with a 2816 Switching Unit(s) for tape drive switching ... see 2816 and 16 Drive Addressing (#7185) under "Special Features" below.

2804 -- considering "Write," "Write Tape Mark" and "Erase" as write operations, the 2804 can perform a read and a write operation simultaneously.

2803/2804 -- each unit contains error detection and single track error correction facilities.

Tape compatibility special features permit reading/writing of tapes of varying formats and bit densities by attached drives equipped with appropriate read/write heads .. see compatibility features under "Special Features."

Prerequisites: For 2803 -- a control unit position on a system channel ... For 2804 -- a control unit position on each of two channels of the same system. For channel limitations, see "S/360, S/370, 4300 Processors." below.

Simultaneous Read-write-Write (#7160, 7161) is required on each 2401/2402 attached to a 2804. Mode Compatibility (#5121, 5122) is required on each 2401/2402 mdl 1, 2 or 3 attached to a 2803/2804 mdl 2 ... see Special Features" under appropriate unit.

S/360, S/370, 4300 Processors:

2803 -- can be attached to S/360 mdls 22 thru 91 and 195, any S/370 Processor (except 3115 or 3125), or any 4300 Processor.

2804 -- can be attached to S/360 mdls 22, 30 thru 91 and 195, all S/370 Processors (except 3115 and 3125), and the 4311 Processor. Limitations: For individual tape drive limitations, see S/360 and S/370 models or 4300 Processors, see 2401 (or 2402), or 2420.

[1] In a S/360 mdl 25, only 2803 mdl 1s, 2s or 3s can be attached, and they must be attached to the selector channel. In addition, only 2401s which do not exceed a 60K data rate can be attached ... see 2401.

[2] In a S/360 mdl 22, 30 thru 50, or S/370 mdl 135, 135-3, 138, 145, 145-3 or 148, if attached to a multiplexer channel, a 2803 or 2804 must be attached via a shared-path channel Mdl 135, 135-3, 138 -- not supported on byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or selector channel.

[3] A 2803 mdl 2 can be attached to a S/360 mdl 67 only if the mdl 67 is operated in 65 mode.

[4] In a S/360 mdl 67-2, both channels required by a 2804 must be attached to the same 2846.


Bibliography:

S/360 -- GC20-0360, S/370 -- GC20-0001
Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. For 2803 only #9046 for white.

[3] 2420 Prospect (2803 mdl 2 only): #9701 ... must be specified on AAS if the 2803 mdl 2 is to be used for ferrite attachment of 2420 mdl 5s/7s. See 2420 Model 5/7 Attachment (#7900) under "Special Features."

[4] Control Unit Isolation: Field installation may be required on certain units ... see #4701-4705 under "Special Features."

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2803/2804 Tape Control (cont'd)
both Nine Track (800 NRZI) Compatibility (#5320, 5321) and
Seven Track Compatibility (#7127, 7128). Permits reading and
writing by attached mdl 1, 2 or 3 tape drives equipped with either
7-track or 9-track Read/Write Heads (#9557, 9558) or attached
mdl 4, 5 or 6 drives with Dual Density 800-1600 BPI (#3471, 3472).
Specify: The number of drives equipped with 7-track
Read/Write Heads that are to be associated with this feature.
#7135 -- for 2803 mdl 2 ... #7136 -- for 2804 mdl 2.
Limitation: Cannot be installed with Nine Track (800 BPI NRZI)
Compatibility (#5320, 5321) or Seven Track Compatibility
(#7127, 7128).

16 DRIVE ADDRESSING (#7185). [2803 mdl 1 or 2 only] Re-
quired when the pool of drives attached through 2816 Switching
Unit md1 1a exceeds eight. Permits the 2803 to address up to
sixteen drives. Prerequisite: Two 2816 md1 1s with appropriate
features ... see 2816.

2420 MODEL 5/7 ATTACHMENT (#7900). [2803 mdl 2 only] To
attach up to eight 2420 mdl 5s and 7s in any combination. With
this feature, the tape drive combination can include 2401/2402
mdl 4s, 5s and 6s. If #5320, #7127 or #7135 is also installed
on the 2803 mdl 2, the eight tape drive combination can also
include 2401/2402 mdl 1s, 2s and 3s. Prerequisite: The 2803
must be serial no. above 14000 and below 30000 ... if this feature
is not specified and 2420s will be attached to the 2803 at
a future date, see item [3] under ‘Specify.”

Notes:
[1] A 2803 mdl 2 (serial no. 14001 through 15999) with
#7900 requires a 2420 Model 5 Modification (#9690) if 2420
mdl 5s are to be attached. Submit specifying #9690).

TWO CHANNEL SWITCH (#8100). [2803 mdl 1 only] [Plant
installation only] To attach the 2803 mdl 1 to a second channel.
Switching is under program control. Includes partitioning. For use
in a S/360 mdl 67, a S/360 mdl 65 MP, or a S/370 mdl 156 MP
or 168 MP only. Limitation: Only 2803 mdl 1s above serial no.
30000 can be modified at the plant with this feature. New produc-
tion on 2803 mdl 1s above serial no. 30000 ceased in April,
1968. Prerequisites: If #8100 is routed through the Configura-
tion Control Panel (#1505) of a S/360 mdl 65 MP, Remote
Switch Attachment (#6148) is required. #8148 is also required in
a S/360 mdl 67-2, or a S/370 mdl 156 MP or 168 MP.

---FTP---
MAC/MLC MLC
Special Feature Prices: MRC 1 Yr* 2 YrPurchase MMC FIC
On 2803/2804 (any model)
Data Conversion
on 2803 #3228 $49 $45 $41 $1,935 $1.50 $88
on 2804 3236 77 71 66 3,070 2.00 179
Isolation, Control Unit
on basic 2803 mdl 1 4701 NC NC NC NC NC NC
on 2803 mdl 1 w #8100 4702 NC NC NC NC NC NC
on 2803 mdl 2 4703 NC NC NC NC NC NC
on 2804 mdl 1 4704 NC NC NC NC NC NC
on 2804 mdl 2 4705 NC NC NC NC NC NC
7 Track Compatibility
on 2803 mdl 1 7125 54 50 45 2,145 2.00 131
on 2804 mdl 1 7126 83 78 70 3,270 3.00 179
on 2803 mdl 2 7127 195 179 164 7,545 29.50 869
on 2804 mdl 2 7128 223 205 187 8,625 34.00 1,070
On 2803/2804 model 2
9 Track Compatibility
on 2803 mdl 2 5320 256 236 215 9,925 45.00 946
on 2804 mdl 2 5321 311 286 261 12,000 35.00 1,140
7 & 9 Track Compatibility
on 2803 mdl 2 7135 420 386 353 16,090 77.00 1,245
on 2804 mdl 2 7136 503 463 423 19,400 70.00 1,530
On 2803 mdl 1 or 2
16 Drive Addressing 7185 26 24 22 1,100 1.50 66
On 2803 mdl 1
Remote Switch Attachment 6148 NC NC NC NC NC NC
Two Channel Switch 8100 110 101 92 3,765 5.50 PO
On 2803 mdl 2 ... serial no. above 14000 and below 30000 only
2420 Mdl 5/7 Attachment 7900 381 351 320 15,210 14.50 251

* FTP is 12-23 months.


2816 Switching Unit

Purpose: To switch drives between tape control units and a common group of magnetic tape drives in a S/360 model 22, 30 thru 85 or 195, any S/370 Processor (except 3115 or 3125), or any 3300 Processor.

Highlights: For switching between 2803 Tape Controls and 2403 Magnetic Tape Unit and Controls and drives of all models of 2401s, 2402s, 2403s, except for switching between 2803 model 3 and 2401 model 8, which cannot be attached via the 2826. Also provides switching capability for 2420 Magnetic Tape Unit model 5a and 7s and all models of 2401s and 2402s used with 2803 model 2s. Note: Phase Encoded tape control units 2401 model 6866 for complete details.

The basic 2816 provides for switching between two tape controls and tape unit with an increased number of access paths. It reduces the number of tape drives necessary for any given application by providing each tape unit with an increased number of access paths.

The basic 2816 provides for switching between two tape controls and up to four tape drives. This switching ability can be expanded in increments of one tape control and/or four tape drives to a maximum of sixteen drives. See "Special Features" for feature requirements. Note: The use of two 2816s to switch more than eight tape drives requires 16 Drive Addressing (#7185) on the tape control units ...

Bibliography:
S/360 -- GC20-0360, S/370 -- GC20-0001

Specify:
[1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.
[2] Color: #9041 for red, #9042 for yellow, or #9043 for blue.
[3] Cabling: #9080 for below floor, or #9081 for on floor.

--- FTP ---

Special Feature Prices:

<table>
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<tr>
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<th>2 Yr Purchase MMMC</th>
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<td>$166</td>
<td>$153</td>
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<tr>
<td>3rd Control 1051</td>
<td>67</td>
<td>62</td>
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<td>4th Control 1052</td>
<td>67</td>
<td>62</td>
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<tr>
<td>Add'l Drive Adapter 1055</td>
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<td>30</td>
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<tr>
<td>Control for Base Drives 3rd</td>
<td>2285</td>
<td>94</td>
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<tr>
<td>4th</td>
<td>2286</td>
<td>26</td>
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<tr>
<td>4th Control Attachment 4455</td>
<td>67</td>
<td>62</td>
</tr>
<tr>
<td>2nd 2816 Attachment 1st Control 6392</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>2nd Control 6393</td>
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<td>9</td>
</tr>
<tr>
<td>Tape Drive Intermix 7803</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

--- FTP ---


SPECIAL FEATURES

ADD'L DRIVES FOR BASIC SWITCH (#1050). For switching between four additional tape drives and the first and second tape controls attached to the basic switch.

ADD'L DRIVES FOR THIRD CONTROL (#1051). Permits the third tape control to access the four additional tape drives associated with #1050. Prerequisites: Add'l Drives for Basic Switch (#1050) and Add'l Drive Adapter (#1055).

ADD'L DRIVES FOR FOURTH CONTROL (#1052). Permits the fourth tape control to access the four additional tape drives associated with #1050. Prerequisites: Add'l Drives for Basic Switch (#1050), Add'l Drive Adapter (#1055), and Fourth Control Attachment (#4455).

ADD'L DRIVE ADAPTER (#1055). Provides for the installation of, and is prerequisite for, feature #1051 and/or #1052. Prerequisites: Add'l Drives for Basic Switch (#1050) and Control for Base Drives, Third (#2285).

CONTROL FOR BASE DRIVES, THIRD (#2285). To attach a third tape control to the basic switch with access to the four tape drives included with the basic switch.

CONTROL FOR BASE DRIVES, FOURTH (#2286). To attach a fourth tape control to the basic switch with access to the four tape drives included with the basic switch.

FOURTH CONTROL ATTACHMENT (#4455). To attach a fourth tape control ... prerequisite to feature #4455. Prerequisite: Control for Base Drives, Third (#2285).

SECOND 2816 ATTACHMENT - FIRST CONTROL (#6392). Interconnects two 2816s. Connects the tape control occupying the first position on a 2816 to a feature installed in a second 2816.

SECOND 2816 ATTACHMENT - SECOND CONTROL (#6393). Interconnects two 2816s. Connects the tape control occupying the second position on a 2816 to a second 2816 or to a feature installed in a second 2816.

If this feature is installed, it must be connected to the second 2816 at all times. Prerequisite: Second 2816 Attachment - First Control (#6392).

TAPE DRIVE INTERMIX (#7803). Required on each 2816 when 2400 model 1s, 2s or 3s are to coexist with 2400 model 4s, 5s or 6s, or with 2420 model 5s or 7s.

* FTP is 12-23 months.
M 2821.1
May 79

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SPECIAL FEATURES

COLUMN BINARY (#1990). [Models 1, 4, 5, 6 only] Cards with multiple significant digit punching in a single card column can be processed by the 2540 ... the Extended BCD Interchange Code used by 3/360 assemblies and compilers does not require this feature on the 2521. Prerequisite: Column Binary (#1990) on the 2030 Processing Unit if column binary cards are to be processed on the 2821 when the S/360 mdl 30 is operating in 1401/1440/1460 compatibility mode.

1,100 LPM PRINTER ADAPTER (#3615). [Models 1, 2, 3, 5 only] To attach a 1403 Printer mdl 3 or N1. One #3615 is required for each 1,100 LPM printer attached. Specify: With each #3615, one of the following, depending upon the control position to which the printer is to be attached: #9262 -- to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5 ... #9264 -- to Printer Control No. 3 on a 2821 mdl 3 or 5. Third Printer Control (#7945) is also required.

ISO/LATION, CONTROL UNIT (#4701-4705). [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2821 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating.

#4701 -- for a 2821 mdl 4.
#4702 -- to a 2821 mdl 1, 2, 3 or 5 with neither Two Channel Switch (#8100) nor Universal Character Set Adapter (#8637, 8638, 8639).
#4703 -- for a 2821 mdl 1, 2, 3 or 5 with #8637, 8638 or 8639, but not #8100.
#4704 -- for a 2821 mdl 1, 2, 3 or 5 with #8100 but not with #8637, 8638 or 8639.
#4705 -- for a 2821 mdl 1 or 2, 3 or 5 with both #8100 and #8637, 8638 or 8639.

Prerequisites: in all cases there are compatible EC level requirements.

#4703 requires both #8637, 8638 or 8639 ... #4704 requires #8100 ... #4705 requires both #8100 and #8637, 8638 or 8639.

PUNCH FEED READ CONTROL (#5895). [Models 1, 4, 5, 6 only] Required for Punch Feed Read (#5890) on a 2540.

READ-COMPARAD ADAPTER (#5991). [Model 4 only] Required for Read-Compare (#5990) on a 1404.

REMOTE SWITCH ATTACHMENT (#6148). [Models 1, 2, 3, 5 only] To attach the Two Channel Switch (#8100) to a 2167 Configuration Unit in a S/360 mdl 67-2, to a S/360 mdl 65 MP which has the Configuration Control Panel (#1505) installed, or to a S/370 mdl 158 MP or 168 MP.

SELECTIVE TAPE LISTING CONTROL (#6412). Required for Selective Tape Listing Feature (#6410, 6411) on a 1403 mdl 2, 3 or N1. One #6412 is required for each printer equipped with #6410. Specify: With each #6412, one of the following, depending upon the control position to which the printer with #6410 or 6411 is to be attached:

#9761 -- to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5.
#9762 -- to Printer Control No. 2 on a 2821 mdl 3 or 5.
#9763 -- to Printer Control No. 3 on a 2821 mdl 3 or 5 ... #7945 is also required.

Note: Orders for this feature for a 1403 mdl N1 equipped with Selective Tape Listing Feature (#6410) are no longer accepted ... for 1403 mdl N1s equipped with the new Selective Tape Listing Feature (#6420), see #6425 below.

SELECTIVE TAPE LISTING CONTROL (#6425). [Models 1, 2, 3, 5 only] [For use in S/360 mdls 22, 25, 30, 40, 50 only] Required for any Tape List Control Feature (#6420) on a 1403 mdl N1. One #6425 is required for each printer equipped with #6420. Specify: With each #6425, one of the following, depending upon the control position to which the printer with #6420 is to be attached:

#9765 -- to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5.
#9766 -- to Printer Control No. 2 on a 2821 mdl 3 or 5.
#9767 -- to Printer Control No. 3 on a 2821 mdl 3 or 5 ... #7945 is also required.

THIRD PRINTER CONTROL (#7945). [Models 3, 5 only] [Plant installation only] To attach a third printer. Any combination of the following, mdls 2, 3, 7, N1 can be used. An 1,100 LPM Printer Adapter (#3615) is required for each 1403 mdl 3 or N1 attached.

2540 COMPATIBILITY ATTACHMENT (#8065). [Models 1, 4, 5, 6 only] Required if the 1402/1403 Attachment (#4453) with 1401/1440/1460 Basic Compatibility (#4456) or 1620 Compatibility (#7190) is used on a 2030 Processing Unit, or 1401/1460 Compatibility (#4457) is used on a 2040 Processing Unit ... not required for normal S/360 operation of the 2540. Required if 1401/1440/1460 Compatibility (#3950) is used on a 4331 ... not required for normal 4300 Processor operation of the 2540.

TWO CHANNEL SWITCH (#8100). [Models 1, 2, 3, 5 only] [Plant installation only] To attach the 2821 to a second channel. Switching is under program control. Includes partitioning. For use in a S/360 mdl 67, a multiprocessor S/360 mdl 65, or a S/370 mdl 158 MP or 168 MP.

Prerequisites: If the Two Channel Switch is routed through the Configuration Control Panel (#1505) of a multiprocessor S/360 mdl 65, Remote Switch Attachment (#6148) is required. #6148 is also required in a S/360 mdl 67-2, or a S/370 mdl 158 MP or 168 MP. See above. For a 2821 mdl 1 or 5, a Two Channel Switch Adapter (#8202) is required on the attached 2540.

UNIVERSAL CHARACTER SET ADAPTER (#8637-8639). [Models 1, 2, 3, 5 only] Required for Universal Character Set Feature (#8641 on 1403 mdl 2, #8640 on 1403 mdl 3 or N1) ... one adapter is required for each printer so equipped. Note: A 1403 previously equipped with a Multiple Character Set Feature (#5110 on 1403 mdl 2, #5111 on N1) can be attached to the 2821. The MCS Feature provides the same function as the UCS Feature on the printer.

#8637 -- to attach such a printer to a 2821 mdl 1 or 2, or to Printer Control No. 1 on a 2821 mdl 3 or 5.
#8638 -- to attach such a printer to Printer Control No. 2 on a 2821 mdl 3 or 5.
#8639 -- to attach such a printer to Printer Control No. 3 on a 2821 mdl 3 or 5 ... #7945 is also required.

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**Purpose:** Control unit for a 2671 Paper Tape Reader in an S/360 model 22, 25, 30, 40, 44, 50, 67, a S/370 model 115 thru 158, a 3031 or 3032 Processor, or a 4300 Processor.

**Highlights:** Provides status and data information from the 2671 to the processing unit ... checks for parity ... signals end of record and end of tape ... code translation, where required, is performed by the processing unit.

**Prerequisite:** A control unit position on a system channel:
- **S/360 model 25** -- special feature on 2025: Multiplexer Channel or Selector Channel ... see 2025.
- **S/360 model 22, 30, 40, 50** -- multiplexer channel (standard), Selector Channels (special features, except on 2022 one selector channel is standard) ... see 2022, 2030, 2040, 2050.
- **S/360 model 44** -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add'l High Speed Multiplexer Subchannels ... see 2044.
- **S/360 model 67** -- basic multiplexer channel of 2870 ... see 2870.
- **S/370 model 115, 125** -- Multiplexer Channel (special feature) ... see 3115, 3125.
- **S/370 model 135** -- multiplexer channel (standard), Selector Channels (special features), Block Multiplexer Channel (special feature) ... see 3135.
- **S/370 model 135-3** -- byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.
- **S/370 model 138** -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.
- **S/370 model 145** -- multiplexer channel (standard), selector channel (one is standard), Block Multiplexer Channel (special feature) ... see 3145.
- **S/370 model 145-3** -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.
- **S/370 model 148** -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.
- **S/370 model 155, 158** -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), block multiplexer channels (first two are standard) ... see 3155, 3158.
- **3031 or 3032 Processor** -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

**4331 Processor** -- byte multiplexer channel (optional), block multiplexer channel (optional) ... see 4331.

**4341 Processor** -- byte multiplexer channel (standard), block multiplexer channels (two are standard) ... see 4341.

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

[3] Isolation, Control Unit: May be required on units shipped prior to December 29, 1967 ... see "Special Features" below.

**PRICES:** Mdl MRC Purchase MMC

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<td>$235</td>
<td>8,630</td>
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</table>

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: B
Warranty: B
Metering: I/O Unit (online, meter on 2671) Purchase Option: 55%

**SPECIAL FEATURES**

**ISOLATION, CONTROL UNIT (#4700).** [For field installation on units shipped prior to December 29, 1967 ... standard on units shipped after that] To turn power on or off on the 2822 without generating spurious signals. Thus, a CPU program, if it can be logically disconnected from the system before power is turned off, can continue operating. **Prerequisite:** in all cases there are compatible EC level requirements,

**Special Feature Prices:**

<table>
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<tr>
<th></th>
<th>MAC/</th>
<th>MRC</th>
<th>Purchase</th>
<th>MMC</th>
<th>FIC</th>
</tr>
</thead>
</table>

† Manufactured in France. Freight charges from point of shipment in U.S.A.
2835 STORAGE CONTROL

Purpose: Control unit for 2305 Fixed Head Storage(s) in a S/360 model 85, 195, S/370 model 145, 145-3, 148, 155, 158, 165, 166, 195, a 3031, 3032 or 3033 Processor, or any 4300 Processor.

Model 1  For attachment of 2305 mdl 1s.

Model 2  For attachment of 2305 mdl 2s.

Model Changes: Cannot be made in the field.

Highlights: Up to two 2305 mdl 1s can be attached to a 2835 mdl 1 ... a total data capacity of up to 10.8 million 8-bit bytes. Data is transferred to and from a group of non-shared subchannels of a 2830 or the block multiplexer channel of a 3031, 3032 or 3033, at a rate of 3.0 million bytes/second.

Up to two 2305 mdl 2s can be attached to a 2835 mdl 2 ... a total data capacity of up to 22.4 million bytes. Data is transferred to and from a group of non-shared subchannels of a 2830 or the block multiplexer channel of a 3031, 3032 or 3033 at a rate of 1.5 million bytes/second.

A pattern of correction code bytes is automatically recorded after each count, key, and data area. Error detection and correction is accomplished by decoding the bytes generated while reading and comparing with the recorded bytes.

File organization and format are under program control, allowing data and key fields to be variable in length on an individual record basis.

Greater utilization of available storage is made by allowing a record to 'overflow' from one track to another. Logical files are protected by a combination of commands in the 2835 and checks within the control program.

Multiple track operation allows search and read operations to proceed from track to track. Command chaining allows multiple records to be read/written by a sequence of channel commands, without rotational delays between records.

Rotational positional sensing allows the channel to 'seek' to an angular track position by using the "Set Sector" command. This permits disconnection during most of the rotational latency period and it contributes to increased channel availability. The unit attaches to the 2880 Block Multiplexer Channel or integrated block multiplexer channel of a 3145, 3145-3, 3148 or 3155 and will accept and properly act upon the "Set Sector" and "Read Sector" commands.

Multiple requesting is provided which allows for chain command queuing within the 2835. This is accomplished by allowing multiple (up to 16) channel command chains to be active in the facility. For more information, see the 2305 Fixed Head Storage.

Limitations:

2305 mdl 1 and mdl 2 cannot be intermixed on the same 2835.

S/370 mdl 145 -- 2835 mdl 1 cannot be attached ... the 2835 mdl 2 must be attached to channel 2 on 3145 IFA systems ... the Word Buffer (#8810) is required on the 3145.

S/370 mdl 145-3, 148 -- 2835 mdl 1 cannot be attached.

S/370 mdl 155, 158 or 3031 Processor -- 2835 mdl 1 cannot be attached ... 2835 mdl 2 can be attached only to the first and second block multiplexer channels ... no more than two may be attached to any one channel.

4341 Processor -- 2835 mdl 1 cannot be attached.

Prerequisites: A control unit position on a block multiplexer channel of a 3145, 3145-3, 3148, 3155, 3158, 3031, 3032, 3033 or 4341; or a 2880 Block Multiplexer Channel ... Word Buffer (#8810) is required on the 3145 ... the 2835 mdl 1 also requires Two Byte Interface (#7850, 7851) on the 2880 or on the 3032 or 3033 channel to which it is attached.

The 2835 is designed for interconnected operation as part of a 2835/2305 facility. Customers who wish to order a 2835 for stand-alone or individual use should submit an RPQ to provide the necessary safety elements (covers, cable connectors, etc.) to complete the unit for a non-standard (i.e., not interconnected with a 2305) environment. In lieu of the RPQ, the customer may provide safety elements equivalent to the standard 2835/2305 configuration or that provided by the above RPQ. If not provided, the unit will be offered on a purchase-only basis.

Agreement for IBM to install and maintain the 2835 in any non-standard environment must be reviewed ... see item [3] under "Specify."


Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Non-standard Environment: #9485 ... must be specified if the 2835 is not to be installed as part of a 2305-2835 combination.

[4] Two Drive Facility: #9702 ... must be specified if two 2305s are to be attached to the 2835. Note: If a second drive is to be field installed, #9702 must be ordered. Refer to 2305 for further ordering instructions.

PRICES:

<table>
<thead>
<tr>
<th></th>
<th>FTP /--</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mdl</td>
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<tr>
<td></td>
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Plan Offering: Plan A, Additional Use Charge Rate: 10%

Maintenance: A Per Call: 3 Warranty: B

Metering: Assignable Unit Purchase Option: 45%

Useful Life Category: 1 Upper Limit Percent: 0%

Termination Charge Months: 5 Termination Charge Percent: 25%

Model/Feature Additional Charge in lieu of AU Charge: 10%

SPECIAL FEATURES

REMOTE SWITCH ATTACHMENT (#6148, 6149). To attach the Two Channel Switch (#8170, 8171) to the configuration control panel of a S/370 mdl 158 MP or 168 MP. #6148 -- for 2835 mdl 1 ... #6149 -- for 2835 mdl 2.

TWO CHANNEL SWITCH (#8170, 8171). To attach the 2835 to a second channel, allowing two S/360s, S/370s or 4341s, or two channels of the same S/360, S/370 or 4341, access to a common data capacity under program control. #8170 -- for 2835 mdl 1 ... #8171 -- for 2835 mdl 2.

Remote Switch Attachment

<table>
<thead>
<tr>
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<tr>
<td></td>
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<td>Special Feature Prices:</td>
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<tr>
<td>Mdl</td>
<td>MRC</td>
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<tr>
<td></td>
<td>1 Yr</td>
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<tr>
<td>Purchase</td>
<td>MMC</td>
</tr>
<tr>
<td>FIC</td>
<td></td>
</tr>
</tbody>
</table>

Call: 3

Purchase MMMC

FIC

Two Channel Switch

for Model 1: #6148

for Model 2: #6149

Two Channel Switch

for Model 1: $215

for Model 2: $286

Two Channel Switch

for Model 1: $125

for Model 2: $7.00

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The 2840 Display Control mdl 1, used for control of 2250 Display Unit mdl 2s, is no longer available ... the following special feature is available for field installation on installed units.

**ABSOLUTE VECTORS CONTROL (#1003).** Controls which permit attached 2250 mdl 2s equipped with Absolute Vectors (#1001) to "draw" a continuous straight line between any two points of their 1,024 x 1,024 reference grids. Maximum: One.

**MAC/ Special Feature Prices:**

<table>
<thead>
<tr>
<th>Feature</th>
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<th>MMMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Vectors</td>
<td>$217</td>
<td>$8,715</td>
<td>$8.00 $203</td>
</tr>
</tbody>
</table>

**Purpose:** Control unit that provides common circuits for multiple 2250 Display Unit mdl 3s in a S/360 mdl 22, 30 thru 85, 195, any S/370 Processor, or any 4300 Processor.

**Limitation:** Cannot be used for 2250 mdl 1s.

**Highlights:** Provides controls and attachments for up to two 2250 mdl 3s. With Display Multiplexer (#3352), up to four 2250 mdl 3s can be controlled. See "Special Features." Each 2250 Display Unit on a system can be located 2,000 cable feet from the 2840. Includes 32,768 bytes of core buffer, a character generator, absolute vectors control, the 2250 set of eleven orders, and an additional set of orders for graphic design applications.

**Prerequisites:** A control unit on a system channel and a minimum of 64K bytes of processor storage for use of graphic support under OS ... a minimum of 16K for diagnostic support only.

S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard), Selector Channels (special features, except on 2022 one is standard) ... see 2022, 2030, 2040, 2050.

S/360 mdl 44 -- special features on 2044: Multiplexer Channel, High Speed Multiplexer Channels, Add'l High Speed Multiplexer Subchannels ... see 2044.

S/360 mdl 65, 67, 75 -- selector channel of 2860, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195, or S/370 mdl 165, 168, 195 -- selector channel of 2860, Selector Subchannels (special features) on 2870, shared subchannel of 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135 -- multiplexer channel (standard), Selector Channel or Block Multiplexer Channel ... see 3135.

**Purpose:** Provides two additional attachments for two 2250 mdl 3s. Maximum: One.

**Special Feature Prices:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC Purchase</th>
<th>MMMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display Multiplexer</td>
<td>$43.75</td>
<td>$39.90</td>
<td>$16.00 $40.75</td>
</tr>
</tbody>
</table>

**Not to be reproduced without written permission.**
2860 SELECTOR CHANNEL

Purpose: Selector channel(s) for attachment and control of a wide variety of I/O control units, for a S/360 mdl 65 thru 195, or a S/370 mdl 165, 168, 195.

Model 1 Has one selector channel.
Model 2 Has two selector channels.
Model 3 Has three selector channels.

Model Changes: Available at time of manufacture only.

Highlights: Channels permit data rates up to 1.3 million bytes/second. A full set of channel control and buffer registers permit each channel to operate with minimal interference. Up to eight I/O control units can be attached to each channel, permitting a wide variety of attached devices. I/O operations are overlapped with processing and, depending upon the data rate, all channels can operate simultaneously.

Maximum:
S/360 mdl 65, 67-1 (2067 mdl 1), 75 -- up to two 2860s in any combination of models can be attached. Up to two 2870 Multi-plexer Channels can also be attached. Total channels (both 2860 and 2870) cannot exceed seven per CPU.

Limitations: On either a 65 MF system with eight 2365 mdl 13 frames, or on a system with four 2361 mdl 2s, only three channel frames or seven logical channels, whichever occurs first, can be attached. The 2860 may only use channel addresses 1 through 6. If no 2870s are attached, only up to six logical channels can be attached per CPU.

S/360 mdl 67-2 (one or two 2067 mdl 2s) -- up to two 2860s in any combination can be attached to each 2846 Channel Controller. A 2870 Multiplexer Channel can also be attached to each 2846.

S/360 mdl 85, 195, or S/370 mdl 165, 168, 195 -- up to two 2860s in any combination of models can be attached. 2870 Multi-plexer Channels and 2880 Block Multiplexer Channels can also be attached. For combinations possible, see 3165, 3168 or 3195.

Prerequisites:
With 2065 or 2067 mdl 1 -- Channel Attachment (#9065) is required to attach channels addressed 3 and 4. Channel Attachment (#9066) is required in addition to #9065 to attach channels addressed 5 and 6. See "Specify" under 2065 and 2067.

With 2067 mdl 2 -- a 2846 Channel Controller is required.

With 2075 -- a 2075 Attachment (#9820) is required on each 2860 ... see "Specify.".

With 2085 -- a 2085 Attachment (#9821) is required on each 2860 ... see "Specify.". On the 2085, Channel Attachment (#9065) is required to attach channels addressed 3 and 4. Channel Attachment (#9066) is required in addition to #9065 to attach channels addressed 5 and 6. Consult Special Product Marketing.

With 3165 -- a 3165 Attachment (#9828) is required on each 2860 ... see "Specify.".

With 3165, 3168, 3168-3 -- a 3165/3168/3168-3 Attachment (#9830) is required on each 2860 ... see "Specify.". When attaching this channel to a S/370 mdl 165, the 3165 must have sufficient addressing capability ... see "Channel Attachment" under "Specify" for the 3165. For S/370 mdl 165 systems, the power distribution unit must be equipped for at least the number of frames actually attached ... see "Channel Frames" under "Specify" for the 3067 mdl 1. Channel Indirect Data Addressing feature is required for a system operating in EC mode see "Special Features."

Isolation: Appropriate features are required on any 2860 shipped prior to September 7, 1967 ... see "Special Features."


Specify: [1] Voltage (AC. 3-phase. 4-wire. 60 Hz): #9903 for 208 V, or #9905 for 230 V.
[2] Method of Installation: #9400, if 2860 will not be installed on a raised floor.
[3] 2075 Attachment: #9820 ... required for attachment to a 2075.
[4] 2085 Attachment: #9821 ... required for attachment to a 2085.
[5] 3195 Attachment: #9828 ... required for attachment to a 3195.
[6] 3165/3168/3168-3 Attachment: #9830 ... required for attachment to a 3165, 3168, or 3168-3.
[7] Unit Position: Required on 2860s when more than one unit, either 2860 or 2870, is attached to a 2065, 2067 mdl 1, 2075, 2085, 2846, or 3165. Specify #9501 on each 2860 that is not attached last on the channel bus. If the 2860 is to be last (only when there is no 2870) no code is required. When field installing an additional 2860 which will be last on the bus, order #9501 for the installed 2860 that is currently last on the bus. All orders for #9501 must give the model, serial number and special features on the installed 2860. On the 3165, 3168-3 or 3195, the bus is two cable strings to which the channels are attached. Therefore, for each string specify #9501 for each 2860 that is not attached last on that string. If the 2860 is last on either string, no code is required. When field installing an additional 2860 which is to be last on the string, order #9501 for the installed 2860 that is currently last on the string.
[8] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
[9] Two-processor System: A 2860 that is to be used in a S/360 mdl 67-2 with two 2067 mdl 2s requires Address Prefacing (#1095) ... see "Special Features."
[10] 2301 Drum Storage: In a S/360 mdl 67-2, or a S/370 mdl 165, High Speed Direct Access Storage Priority (#4597) is required on the selected channel to which 2820 Storage Control for the 2301 is to be attached ... see "Special Features."
[11] Isolation Features: Appropriate features must be ordered for field installation on units shipped prior to September 7, 1967 ... see "Special Features."

TPK/PRICES: Mdl | MAC/ | MLC  MAC/ | MLC  MAC/ | MLC
2860 1 $2,400 $2,185 $112,050 $63,500
2     3,420 3,110 159,600 103,000
3     4,455 4,050 206,600 144,000
Plan Offering: Plan A, Additional Use Charge Rate: 10%: Maintenance: B Per Call: 3 Warranty: B Metering: Assignable Unit Purchase Option: 55% Termination Chg Months: 6 Termination Chg Percent: 25% Model/Feature Additional Charge in lieu of AU Charge: 15% Upper Limit Percent: 5%

SPECIAL FEATURES

ADDRESS PREFIXING (#1095). [For use in a S/360 mdl 67-2 only] One is required on each selector channel in a two-processor system ... provides prefixing to identify the processing unit that has initiated an I/O operation. Specify: #9026 for first channel of 2860 ... #9047 for second ... #9048 for third. Maximum: One per 2860 mdl 1, two per 2860 mdl 2, three per 2860 mdl 3.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two system channels ... only one of the two connected channels requires this feature. The feature is available on each of the channels. The plant must know on which of the three possible 2860 channel gates the adapter is to be installed. Specify: #9095 for installation on first gate ... #9096 for second gate ... #9097 for third gate. Maximum: One per gate.

CHANNEL INDIRECT DATA ADDRESSING (#1861-1863). For use on a S/370 mdl 165 or 195 ... 3165/3168/3268-3 Attachment (#9380) is required on channel. One is required on each selector channel to provide indirect access for data transfer. Required for a system operating in EC mode, #1861 -- for 2860 mdl 1 ... #1862 for 2860 mdl 2 ... #1863 for 2860 mdl 3. Maximum: One per 2860.

HIGH SPEED DIRECT ACCESS STORAGE PRIORITY (#4597). [For use in a S/360 mdl 67-2 or 65, or S/370 mdl 165 only] Gives storage priority to a 2301 Drum over all other devices in the system. Required on a 2860 channel to which a 2301 is attached in the above systems. Specify: #9171 for installation on first channel ... #9172 on second channel. Maximum: In a S/360 mdl 67-2, only one #4597 may be attached to a 2860, regardless of model. Although two 2860s may be attached to a 2046, only one may have this feature. In a S/360 mdl 65 or S/370 mdl 165, up to two features may be used, but they must be located on the first 2860 in the system. Prerequisite: Storage Priority (#7516) on the 2860 Storage Control associated with the 2301.

3803 MODEL 2 ATTACHMENT (#7830). One is required for each 2860 channel to which 3803 mdl 2s are attached. Specify: #9181 for first channel of a 2860 ... #9182 for second channel ... #9183 for third channel. Maximum: One for 2860 mdl 1 ... two for 2860 mdl 2 ... three for 2860 mdl 3.

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2870 MULTIPLEXER CHANNEL

Purpose: For attachment of a wide variety of low to medium speed I/O control units and devices to a S/360 model 65, 67, 75, or S/370 model 165, 168, 195.

Highlights: Provides up to 196 subchannels ... including four Selector Subchannels. See “Special Features.” Aggregate data rates range from 110KB to 670KB, depending upon the features installed.

The basic channel can attach up to eight I/O control units and can address up to 192 I/O devices. Up to four Selector Subchannels can be added, each of which can operate one device simultaneously with the basic channel. Up to eight I/O control units can be attached to each Selector Subchannel. If one 2841 is attached, no other control unit can be attached to that Selector Subchannel ... see 2841. A maximum of sixteen devices can be attached to each Selector Subchannel. The first 2870 attached to a System must be assigned address zero (0). The second 2870 may be assigned any address 1 through 6, dependent upon the total number of channels installed and the priority desired ... see Functional Characteristics SRL for the using system.

Maximum aggregate data rates are shown in the following table. These are machine rates for the 2870 ... for S/360 model 65, 67-1, 75 and 85, or S/370 model 165, 168 or 195, information on system data rates may be found in the appropriate Functional Characteristics SRL.

### SELECTOR SUBCHANNELS

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<thead>
<tr>
<th>Basic Channel</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
</tr>
</thead>
<tbody>
<tr>
<td>S/360 model 65, 67-1 (2067 model 1), 75 ... 2870s can be attached ... up to two 2860 Selector Channels in any combination of models can also be attached. The total number of channels (both 2870s and 2860a) cannot exceed seven per CPU. Limitations: On either a 65 MP system with eight 2365 model 13 frames or on a system with four 2365 model 2s, only three channel frames or seven logical channels, whichever occurs first, can be attached. If no 2870s are attached only up to six logical channels can be attached per CPU. The first 2870 address must be zero and the second is assigned an available address from 1 to 6.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S/360 model 67-2 (one or two 2067 model 2s) ... one 2870 can be attached to each 2846 Channel Controller ... up to two 2860 Selector Channels in any combination of models can also be attached to each 2846.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S/360 model 85, 195 and S/370 model 165, 168, 195 ... 2870s can be attached. 2860 Selector Channels and 2880 Block Multiplexer Channels can also be attached. For combinations possible, see 3165, 3168, 3168-3 or 3195.</td>
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</tbody>
</table>

Note: The 2870 may be connected to another system channel for channel-to-channel interconnection of two system channels. However, the Channel-to-Channel Adapter required for this interconnection must be installed on the other channel, not the 2870 ... unbuffered devices precede buffered devices. A 2821 Control Unit should normally be last in priority because of the high instantaneous data rates.

### Prerequisites:

With 2065 or 2067 model 1 ... Channel Attachment (#9065) is required to attach channels addressed 3 and 4. Channel Attachment (#9066) is required for channels addressed 5 and 6. See “Specify” under 2065 or 2067.

With 2067 model 2 ... a 2846 Channel Controller is required.

With 2075 ... a 2705 Attachment (#9820) is required on each 2870 ... see “Specify.”

With 2085 ... a 2085 Attachment (#9821) is required on each 2870 ... see “Specify.” On the 2085, Channel Attachment (#9065) is required to attach channels addressed 3 and 4. Channel Attachment (#9066) is required for channels addressed 5 and 6. Consult Special Product Marketing Support.

With 3195 ... a 3195 Attachment (#9828) is required on each 2870 ... see “Specify.”

With 3165, 3168, 3168-3 ... a 3165/3168/3168-3 Attachment

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Isolation Features -- one of the following features, as appropriate, must be ordered for field installation on each 2870 shipped prior to December 29, 1967...

**Isolation, Channel-Control Unit** (#4600, 4601). To turn any on or off on the 2870 without introducing noise signals on the I/O interface bus. #4600 -- for a 2870 with no Selector Subchannels. #4601 -- for a 2870 with one or more Selector Subchannels (#6990-6993). Maximum: One per 2870. Prerequisite: #4601 requires at least #6990.

**TP/ MLC**

Special Feature Prices:

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<thead>
<tr>
<th>Feature</th>
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<th>4 Yr Purchase</th>
<th>MMMC</th>
<th>FIC</th>
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</thead>
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<td>$118</td>
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<td>1861</td>
<td>228</td>
<td>208</td>
<td>10,790</td>
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</table>

**Selector Subchannel**

- #9905 for gray, or #9046 for white.
- #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

**SPECIAL FEATURES**

**ADDRESS PREFIXING** (#1095). [For use on a S/360 mld 67-2 with two 2847 mld 2s requires Address Prefixing (#1095) ... see "Special Features." ]

**ISOLATION FEATURES** -- one of the following features, as appropriate, must be ordered for field installation on each 2870 shipped prior to December 29, 1967 ... see "Special Features."
**2880 BLOCK MULTIPLEXER CHANNEL**

**Purpose:** Block multiplexer channel(s) for attachment and control of a wide variety of I/O control units in a S/360 mdl 85, 195, or S/370 mdl 165, 166, 195.

**Model 1** Has one block multiplexer channel.

**Model 2** Has two block multiplexer channels.

**Model Changes:** Not recommended for field installation.

**Highlights:** Channels permit data rates up to 1.5 million bytes/second. With Two Byte Interface (#7850, 7851), data rates up to 3.0 million bytes/second are possible... see "Special Features." Provides up to 56 non-shared (block multiplex mode operation) subchannels per block multiplexer channel, allowing up to 56 block multiplex devices to operate concurrently in a burst interleaved mode on the single data path of the channel. Thus, although only one device may actually be transmitting data at any given time, multiple channel programs may be concurrently active for up to 56 block multiplex devices at one time. Up to eight control units, of which seven may be block multiplexed, can be attached to each channel, permitting a wide variety of attached devices. There will always be one shared (non-block multiplex mode operation) subchannel having all addresses not assigned to non-shared subchannels. Subsequently, the shared channel will always have at least 200 unit addresses and may have up to 256 unit addresses, depending on the number of non-shared subchannels plugged during installation. With the Extended UCW feature installed, the capability of the channel to operate non-shared subchannels is extended from 56 to 256. All block multiplex devices must be assigned to a non-shared subchannel. [Exception: The 2831 and 3811 control units may be attached to either type of subchannel, but non-shared subchannel attachment is recommended.]

Can be connected to a S/360 or S/370 selector channel via a Channel-to-channel Adapter (#1850) on the selector channel. Can be connected to a 4341 Processor via a Channel to Adapter of the block multiplexer channel of the 4341 Processor.

I/O operations are overlapped with processing and, depending upon system considerations and upon data rate, all channels can operate simultaneously.

**Maximum:** Up to three 2880s (six channels), in any combination of models, can be attached. With Extended Channels (#3850) on the 2085, #3850 on the 3195, #3850 on the 3165, or #3850 on the 3165, up to six 2880s (twelve channels) may be attached to a 2085, up to seven 2880s (thirteen channels) may be attached to a 3195, or up to six 2880s (eleven channels) may be attached to a 3165, 3165, 3165, 2815, 3165, 3165, or 3165-3 for allowable channel combinations. For 2085, consult Special Product Marketing Support.

**Limitation:** A 2820 Storage Control equipped with Storage Priority (#7516) cannot be attached to a 2880.

**Prerequisites:**

With 2085 -- 2085 Attachment (#9821) is required on each 2880 ... see **Specify.** On the 2085, an appropriate Channel Attachment (#9065-9069) may be required. Consult Special Product Marketing Support.

With 3195 -- 3195 Attachment (#9828) is required on each 2880 ... see "Specify."

With 3165, 3165, 3165-3 -- a 3165/3165/3165-3 Attachment (#9830) is required on each 3165. For S/370 mdl 166 systems, the power distribution unit must be equipped for at least the number of frames actually attached... see "Channel Frames" under "Specify" for the 3067 mdl 1. Channel Indirect Data Addressing feature is required for a system operating in EC mode... see "Special Features."

**Bibliography:** S/360 -- GC20-0360 S/370 -- GC20-0001

**Specify:** [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] 2085 Attachment: #9821 ... required for attachment to a 2085.

[3] 3195 Attachment: #9828 ... required for attachment to a 3195.

[4] 3165/3165/3165-3 Attachment: #9830 ... required for attachment to a 3165, 3165, or 3165-3.

[5] Method of Installation: #9400, if 2880 will not be installed on a raised floor.

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MAC/ MLC</th>
<th>MRC</th>
<th>Yr</th>
<th>Purchase</th>
<th>MMMC</th>
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<td>$121,850</td>
<td>$268</td>
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<td>2</td>
<td>5,310</td>
<td>4,830</td>
<td>174,500</td>
<td>382</td>
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</tr>
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</table>

**Plan Offering:** Plan A, Additional Use Charge Rate: 10%

**Maintenance:** A Per Call: 3

**Warranty:** B

**Metering:** Assignable Unit

**Purchase Option:** 45%

**Useful Life Category:** 1

**Termination Chg Mnths:** 6

**Termination Chg Percent:** 25%

**Upper Limit Percent:** 5%

**Model/Feature Additional Charge in lieu of AU Charge:** 15%

**SPECIAL FEATURES**

**CHANNEL INDIRECT DATA ADDRESSING (#1861, 1862).** For use on a S/370 mdl 165 II or 168 II, 3165/3168/3168-3 Attachment (#9830) is required on channel. One is required on each channel to provide indirect address for data transfer. Required for system operating in EC mode. #1861 -- for 2880 mdl 1 ...

**EXTENDED UNIT CONTROL WORDS (#3851, 3852).** Extends channel storage to 256 control words. May be installed on either or both channels of a 2880 mdl 2. #3851 -- for mdl 1 or first channel of a mdl 2 ... #3852 -- for second channel of a mdl 2. Limitation: Cannot be installed on the same channel with #7850 or #7851, RPO WE4259 channel-to-channel adapter, and specify feature 2085 Attachment (#9821). Field Installation: Yes.

**TWO BYTE INTERFACE (#7850, 7851).** One is required on each channel attaching a 2835 Storage Control mdl 1 for 2085 Fixed Head Storage(s). #7850 -- for a 2880 mdl 1 or the first channel of a 2880 mdl 2 ... #7851 -- for the second channel of a 2880 mdl 2. Limitation: Cannot be installed on the same channel with #3851 or #3852. Field Installation: Yes.

**TLP Special Feature Prices:**

<table>
<thead>
<tr>
<th>MAC/ MLC</th>
<th>MRC 4 Yr</th>
<th>Purchase</th>
<th>MMMC FIC</th>
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</thead>
<tbody>
<tr>
<td>Channel Indirect Data Addressing for 2880 mdl 1</td>
<td>#1861 $171 $156</td>
<td>$5,650 $1,005 $540</td>
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<tr>
<td>for 2880 mdl 2</td>
<td>1862 342 311</td>
<td>11,240 2.00 3,090</td>
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</tr>
<tr>
<td>Extended Unit Control Words for mdl 1 or 1st chnl of mdl 2</td>
<td>3851 415 378</td>
<td>13,100 4.50 370</td>
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<tr>
<td>for 2nd chnl of mdl 2</td>
<td>3852 415 378</td>
<td>13,100 4.50 370</td>
<td></td>
</tr>
<tr>
<td>Two Byte Interface for mdl 1 or 1st chnl of mdl 2</td>
<td>7850 432 393</td>
<td>14,220 5.00 2,645</td>
<td></td>
</tr>
<tr>
<td>for 2nd chnl of mdl 2</td>
<td>7851 432 393</td>
<td>14,220 5.00 2,645</td>
<td></td>
</tr>
</tbody>
</table>

**Color:** #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

**Unit Position:** #9045 for gray, or #9042 for yellow.

**Maintenance:** A

**Warranty:** B

**Metering:** Assignable Unit

**Purchase Option:** 45%

**Useful Life Category:** 1

**Termination Chg Mnths:** 6

**Termination Chg Percent:** 25%

**Upper Limit Percent:** 5%

**Model/Feature Additional Charge in lieu of AU Charge:** 15%

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**3017 POWER UNIT**

**Purpose:** Provides power for a 3031 Processor or Attached Processor Complex.

**Highlights:** One 3017 Power Unit is required with each 3031 Processor. Two 3017s are required with an Attached Processor Complex.

**Bibliography:** GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.

[3] Cabling: #9080 for below floor, or #9081 for on the floor.


**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>Monthly Rental Charge</th>
<th>4 Year Charge</th>
<th>Purchase Charge</th>
<th>MMMC</th>
<th>Plan Offering</th>
<th>Additional Use Charge Rate</th>
<th>Maintenance</th>
<th>Warranty</th>
<th>Purchase Option</th>
<th>Per Call</th>
<th>Useful Life Category</th>
<th>Termination Charge Months</th>
<th>Termination Charge Percent</th>
<th>Upper Limit Percent</th>
<th>Unit Emergency Power Off</th>
</tr>
</thead>
<tbody>
<tr>
<td>3017</td>
<td>$462</td>
<td>$420</td>
<td>$20,000</td>
<td>$30</td>
<td>Plan A</td>
<td>10%</td>
<td>D</td>
<td>B</td>
<td>55%</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>25%</td>
<td>5%</td>
<td>See 5/370 Installation Manual - Physical Planning, GC22-7004, for details.</td>
</tr>
</tbody>
</table>

**3027 POWER AND COOLANT DISTRIBUTION UNIT**

**Purpose:** Provides power and coolant distribution required by a 3032 Processor Complex.

**Highlights:** One 3027 is required with each 3032 Processor.

**Bibliography:** GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>Monthly Rental Charge</th>
<th>4 Year Charge</th>
<th>Purchase Charge</th>
<th>MMMC</th>
<th>Plan Offering</th>
<th>Additional Use Charge Rate</th>
<th>Maintenance</th>
<th>Warranty</th>
<th>Purchase Option</th>
<th>Per Call</th>
<th>Useful Life Category</th>
<th>Termination Charge Months</th>
<th>Termination Charge Percent</th>
<th>Upper Limit Percent</th>
<th>Unit Emergency Power Off</th>
</tr>
</thead>
</table>
Purpose: Performs arithmetic, logic, processor storage, channel, and control functions for a 3031 Processor or Attached Processor Complex. 3031 A models are used with a 3041 Attached Processor.

Model Bytes of Processor Storage
2 A2 2,097,152
3 A3 3,145,728
4 A4 4,194,304
5 A5 5,242,880
6 A6 6,291,456

Highlights: Depending on the model, contains up to 6,291,456 bytes of monolithic processor storage ... processor cycle time of 115 nanoseconds ... eight-byte parallel data flow with four-way interleaving ... 128 word instruction buffer ... processor functions are controlled by reloadable control storage ... includes 32,768 bytes of buffer storage which is transparent to the programmer and reduces the effective cycle time of processor storage ... sixteen general purpose and four floating point registers are implemented in high speed internal circuits with a four-byte data flow to the I/E function.

Standard Features: S/370 Universal Instruction Set ... extended precision floating point ... interval timer ... store and fetch protect ... byte oriented operand feature ... main storage error checking and correction ... instruction retry ... dynamic address translation ... extended control mode ... program event recording ... one microsecond time-of-cluck clock ... one microsecond CPU timer ... buffer storage (32,768 bytes) ... reloadable control storage ... physically integrated channels ... VMA & OS/VS1 ECPS ... S/370 Extended Facility ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... storage configuration control ... clear I/O ... Unit Emergency Power Off.

Channels: Six channels are standard: One byte multiplexer channel and five block multiplexer channels. The byte multiplexer channel is capable of a data rate of 40 to 75 kilobytes per second. A block multiplexer channel is capable of a data rate of up to 1.5 megabytes per second. 256 subchannels per channel, of which up to eight subchannels per channel may be shared. Channel Indirect Addressing is standard. One optional channel-to-channel adapter.

PREREQUISITES: Each 3031 requires one 3036 Console and one 3017 Power Unit. Two 3017 Power Units, a 3036 Console, a 3041 Attached Processor, and a 3031 Processor Model A are required in an Attached Processor Complex. See S/370 Installation Manual - Physical Planning, GC22-7004.

Bibliography: GC20-0001

SPECIFY
- Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.
- Cabling: Cables can be used above or below the floor ... no specify required.
- RETAIN/370: The capability of using remote service/logout analysis facility is standard. Customer must provide interface for this facility to the telephone line if he desires the feature to be used.
**IBM 3032 Processor**

**Purpose:** Provides arithmetic, logic, processor storage, channels and control functions for a 3032 Processor Complex.

- **Model 2** 2,097,152 bytes of processor storage
- **Model 4** 4,194,304 bytes of processor storage
- **Model 6** 6,291,456 bytes of processor storage

**Highlights:** Depending upon the console and dressable storage... improves access and control... eight-byte double-word storage... base address to a maximum of 80... four-way interleaved... 80 nanosecond processor cycle... transparent... overlap... improved instruction execution rates... improved availability and serviceability.

**Standard Features:** Universal Instruction Set... extended precision floating point... one-microsecond CPU timer... dynamic address translation... channel indirect addressing... extended control mode... program event recording... monitoring... byte-oriented operand feature... buffer storage... fetch and store protection... direct control feature... six channel processors requiring this feature... reloadable control feature... storage configuration control... reloadable control storage... interval timer... processor storage error checking and correction... instruction retry... compare and swap... compare... field installation: Yes.

**Channels:** Six functionally independent channels in one group are standard. A group consists of one byte multiplexer channel and five block multiplexer channels. Single block multiplexer channel speed of up to 1.5 million bytes/second is standard and up to 3 million bytes/second with the Two-Byte Interface (#7850). Each byte multiplexer channel will generally operate in the range of 40-75 KB/second. Each channel has 256 subchannels, of which up to 8 subchannels/channel may be shared. One optional channel-to-channel adapter per processor is available... see “Special Features.”

With the addition of Extended Channels (#3850), a group of five additional block multiplexer channels and one byte multiplexer channel may be added. Availability and serviceability are improved with the addition of this second group through the independent maintenance capability of each channel group.


**Bibliography:** GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Motor Generator and Starter: If desired, see M 10000 pages for ordering instructions and prices.


**Prizes**

- **Mdl** 3032 2 4 $40,000 37,000 $1,590,000 $5,700
- **Mdl** 3032 4 4 47,550 43,240 1,762,000 6,020
- **Mdl** 3032 6 6 53,840 48,970 1,918,000 8,310

**Plan Offering:** Plan A, Additional Use Charge Rate: 10% Maintenance: D Per Call: 3 Warranty: A Purchase Option: 55% Useful Life Category: 2 Termination Charge Months: 6 Termination Charge Percent: 25% Model/Feature Additional Charge in lieu of AU Charge: 15% Metering: Base Unit (meter on 3036) Upper Limit Percent: 5%

**Model Changes:** Field installable.

**Model Upgrade Purchase Price** (there are no additional installation charges)

- From To 4 6
- $172,000 $156,000

**Special Features**

**Channel-to-Channel Adapter (#1850).** To interconnect two channels (either S/360, S/370 or 4314 Processor). Only one of the processors requires this feature. Uses one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. Limitation: Cannot be installed on extended channels. Maximum: One. Field Installation: Yes.

**Extended Channels (#3850).** Provides an additional group of five block multiplexer channels and one byte multiplexer channel. Prerequisite: #1850 on the 3027 Power and Coolant Distribution Unit... see “Specify” under 3027. Specify: Color — #9160 for willow green, #9162 for garnet red, #9163 for sunrise yellow, #9164 for classic blue, #9165 for pebble gray, or #9166 for pearl white. Maximum: One. Field Installation: Yes.

**Two-Byte Interface (#7850).** One is required on each channel attaching a 3838 Array Processor in two-byte mode or a 2305 Fixed Head Storage mdl 1. Maximum: One per channel group on the first block multiplexer channel of that group. Prerequisite: Second #7850 requires Extended Channels (#3850). Field Installation: Yes. Specify: #9201 for standard channel group, #9202 for extended channel group (#3850).

**Chnl-to-Chnl Adapter**

- **Mdl** #1850
- **Price** $410
- **Purchase** $375
- **MMMC** $15,000

**Extended Channels**

- **Mdl** #3850
- **Price** 9,900
- **Purchase** 9,000
- **MMMC** 360,000

**Two-Byte Interface**

- **Mdl** #7850
- **Price** 38
- **Purchase** 35
- **MMMC** 1,400

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IBM 3033 PROCESSOR

Purpose: Provides arithmetic, logic, control functions, processor storage and channels for a 3033 Processor Complex. A and M models provide multiprocessing function.

Models | Bytes of Processor Storage
---|---
U4 | 4,194,304
U6† | 6,291,456
U8 | 8,388,608
U12 | 12,582,192
U16 | 16,777,216

† Models U6 and M6 are no longer available.

Highlights: Depending upon the model, can contain up to 16,777,216 bytes of monolithic processor storage... double-words are eight-word interlock... store CPU address parallel data flow... includes 65,536 bytes of 57 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective access time of storage... buffer storage does not increase the amount of addressable storage... 57 nanosecond processor cycle... overlapped operation of instruction and execution functions... extensive data checking is coupled with increased availability and serviceability.

The A-series is basically identical to the M-series... A or M designates whether the model is used in an AP or MP complex.

Improved instruction execution times over the 3168-3. Improved interrupt execution times over the 3168-3. Improved availability and serviceability through integrated channels.

Standard Features: Universal Instruction Set... extended precision floating point... one microsecond time-of-day clock with clock comparator... one microsecond processor timer... dynamic address translation... extended control mode... program event recording... byte-oriented operand feature... buffer storage (65,536 bytes)... fetch and store protection... direct control... recording... byte-oriented operand feature... buffer storage... storage configuration control... reloadable control storage... interval timer... storage error checking and correction... instruction retry... compare and swap... compare double and swap... insert PSW key... set PSW key from address... clear I/O.

In addition to the above, A and M models provide channel-set switching and four additional instructions: signal processor... set PSW key... store CPU address.

Channels: Twelve integrated channels in two groups are standard. Each group consists of 1 byte multiplexer channel... block multiplexer channels. Single channel block transfer rate of up to 1.5 million bytes/second is standard and up to 3 million bytes/second with the Two-Byte Interface (#7850) installed on the block multiplexer channel. 256 subchannels per channel, on which up to 8 subchannels/channel may be shared. Two optional channel-to-channel adapters per processor.

Prerequisites: Each 3033 requires one 3037 Power and Coolant Distribution Unit, one 3036 Console, and an appropriate 415 Hz power input. Customer-supplied chilled water is required for cooling the system. See S/370 Installation Manual - Physical Planning, GC22-7004.

The 3033 Attached Processor Complex requires a 3033 mdl A processor, a 3042 Attached Processor, a 3038 Multiprocessor Communication Unit, two (2) 3036 Consoles, and two (2) 3037 Power and Coolant Distribution Units [each equipped with Multiprocessing (#5050)].

A 3033 Multiprocessor Complex requires two 3033 mdl M processors, a 3038 Multiprocessor Communication Unit, two (2) 3036 Consoles, and two (2) 3037 Power and Coolant Distribution Units [each equipped with Multiprocessing (#5050)]. A 3033 Processor mdl M must be attached to a 3038 whether or not a second processor is in the complex.

Bibliography: GC20-0001

SPECIFY

- Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
- Motor Generator Set and Starter: If desired, see M 10000 pages for ordering instructions and prices.
- Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, or #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.
- RETAIN/370: The capability of using remote service/login analysis facility is standard. Customer must provide interface for this facility to the telephone line if he desires the feature to be utilized.

Prices:

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MRC</th>
<th>MLC</th>
<th>4Yr</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>U4</td>
<td>$70,020</td>
<td>$63,660</td>
<td>$3,070,000</td>
<td>$7,200</td>
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<tr>
<td>U6†</td>
<td>76,280</td>
<td>69,360</td>
<td>3,225,000</td>
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<tr>
<td>U8</td>
<td>82,360</td>
<td>74,900</td>
<td>3,375,000</td>
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<tr>
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<td>87,010</td>
<td>3,703,000</td>
<td>8,415</td>
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<tr>
<td>U16</td>
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<td>4,003,000</td>
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<td>63,840</td>
<td>3,075,500</td>
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<td>M6</td>
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<td>69,540</td>
<td>3,230,000</td>
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<tr>
<td>M8</td>
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<td>75,080</td>
<td>3,380,000</td>
<td>7,815</td>
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<tr>
<td>M12</td>
<td>95,850</td>
<td>87,190</td>
<td>3,708,000</td>
<td>8,430</td>
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<tr>
<td>M16</td>
<td>108,010</td>
<td>96,270</td>
<td>4,008,000</td>
<td>8,990</td>
<td></td>
</tr>
</tbody>
</table>

From To | U8 | U12 | U16
---|---|---|---
U4 | $305,000 | $211,000 | $268,000 | $328,000 | $388,000 | $448,000 | $3,075,000 |
U6 | 150,000 | 778,000 | 828,000 | 878,000 | 928,000 | 978,000 | 3,075,000 |
U8 | 328,000 | 3,078,500 | 3,708,000 | 4,338,500 | 5,068,000 | 5,698,000 | 8,430,000 |
U12 | 3,075,500 | 3,075,500 | 3,075,500 | 3,075,500 | 3,075,500 | 3,075,500 | 3,075,500 |
U16 | 3,075,500 | 3,075,500 | 3,075,500 | 3,075,500 | 3,075,500 | 3,075,500 | 3,075,500 |

Notes:

1. There are no additional installation charges over the above model conversion and model upgrade prices.
2. The above model conversions and model upgrades are field installable.
3. Planning for Model Conversions and Model Upgrades: When a customer requires model (storage) upgrades in addition to a model conversion, the changes must not be consolidated into a single... Also, model (storage) upgrades should be ordered individually in one-model increments.
4. Parts removed in upgrades from single density models (A4, A6, A8... U4, U6, U8... M4, M6, M8) to double density models (A12, A16... U12, U16... M12, M16) become the property of IBM and must be returned.

SPECIAL FEATURES

CHANNEL-TO-CHANNEL ADAPTER (#1850 for first, #1851 for second). To interconnect two channels... Two, one #1850 and one #1851. Field Installation: Yes.

EXTENDED CHANNELS (#3850). Provides four additional block multiplexer channels, or three block multiplexer and one byte multiplexer channels. Specify: #9150 for four block multiplexer channels, or #9151 for three block multiplexer and one byte multiplexer channels. Prerequisite: #9145 on the 3037 Power and Coolant Distribution Unit... see "Specify" under 3037. Specify Color --
3033 Processor (cont'd)

#9160 for willow green, #9161 for garnet rose, #9162 for sunrise yellow,
#9163 for classic blue, #9164 for charcoal brown, #9165 for pebble gray,
or #9166 for pearl white. Maximum: One. Field installation: Yes.

TWO-BYTE INTERFACE (#7850). One is required on each channel
attaching a 3038 Array Processor in two-byte mode or a 2305
Fixed Head Storage mdl 1. Prerequisite: Third #7850 requires
Extended Channels (#3850). Maximum: One per channel group.
Field installation: Yes. Specify: #9201 for first channel group,
#9202 for second channel group, #9203 for extended channel
group.

Special Feature Prices:
MLC
Channel-to-channel Adapter
First $1850 $410 $375 $15,000 $10
Second 1851 410 375 15,000 10
Extended Channels 3850 8,600 8,000 320,000 500
Two-Byte Interface 7850 38 35 1,400 1

IBM 3036 CONSOLE
Purpose: Provides the switches, lights, displays and control func-
tion for a 3031, 3032 or 3033 Processor, 3031 Attached Proc-
essor Complex, or a 3042 Attached Processor.

Highlights: One 3036 is used with each 3031, 3032 or 3033
Processor, or 3031 Attached Processor Complex. Two 3036s are
used in a 3033 AP or MP Complex. Data can be entered into proc-
essor storage or into internal registers by means of the keyboard.
Contents of storage or internal registers of the processor can be
displayed. Basic diagnostic tests of the processor complex, including proc-
essor, storage, channels and console can be operated from the
console. Dual displays, individually addressable, with their associ-
ated input keyboards and control logic combine to provide a com-
plete console I/O function. Either display may be used by the cus-
tomer as an operator console or by the customer engineer as a
service support console. Also included are devices for loading the control store from a
diskette drive, and a modem for the remote service facility. A systems activity monitor is provided for the 3032 and 3033 Proc-
essors and the 3042 Attached Processor.

PREREQUISITE: Requires two control unit positions and four
device addresses on a channel, or preferably on two channels if a
second channel group is installed [not on 3031]. A fifth device address is required if the remote service option is elected.

Bibliography: GC20-0001

SPECIFY
• Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or
#9905 for 230 V.
• Cabling: [For use with 3031 Processor only] #9080 for below floor,
or #9081 for on floor.
• Unit Emergency Power Off: see S/370 Installation Manual -
Physical Planning, GC22-7004 for details.
• RETAIN/370: May be used with a 3031, 3032 or 3033 Com-
plex: However, it is not required. Remote Support Facility
(RSF) is a customer option. When the option is selected, the cus-
tomer must provide the telephone lines required for the remote
service facility modem. The customer must also arrange for the
connection of the telephone interface cable provided by IBM to the
telephone network.

PRICES: Mdl MRC 4 Yr Purchase MMMC
MLC 3036 1 $3,585 $3,260 $150,000 $590

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Machine Group: D Per Call: 3 Purchase Option: 50%
Warranty: A Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

Metering: Base Unit (meters other units in Processor Complex) ... when
attached to a 3042, the 3036 is an assignable unit and it meters the 3042 and its associated 3037.

IBM 3037 POWER AND COOLANT DISTRIBUTION UNIT
Purpose: Provides power and coolant distribution required by a
3033 Processor or 3042 Attached Processor.

Highlights: One 3037 is used with each 3033 Processor or 3042
Attached Processor ... two 3037s are used in a 3033 AP or MP Complex.

Bibliography: GC20-0001.

SPECIFY
• Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or
#9905 for 230 V.
• Extended Channels: #9145. Required if Extended Channels (#3850)
is installed on the 3033.
• Color: #9060 for willow green, #9061 for garnet rose, #9062
for sunrise yellow, #9063 for classic blue, #9064 for charcoal
brown, #9065 for pebble gray, or #9066 for pearl white.
• Unit Emergency Power Off: See S/370 Installation Manual -
Physical Planning, GC22-7004 for details.

PRICES: Mdl MRC 4 Yr Purchase MMMC
MLC 3037 1 $3,825 $3,480 $160,000 $210

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Machine Group: D Per Call: 3 Purchase Option: 50%
Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

Metering: Base Unit (meter on 3036) ... Assignable Unit when at-
tached to a 3042.

SPECIAL FEATURES
MULTIPROCESSING (#5050). Provides functions for operation in a
3033 AP or MP complex ... required on each 3037 in a 3033
AP or MP complex. The 3037 must be attached to a 3033 A or M
model, or a 3042. Maximum: One. Field installation: Yes.

MLC
Special Feature Prices:
MRC 4 Yr Purchase MMMC
Multiprocessing #5050 $365 $335 $10,000 $15

IBM 3038 MULTIPROCESSOR COMMUNICATION UNIT
Purpose: Control unit used in configuring a 3033 Attached Proc-
essor or Multiprocessor Complex. One is required for each complex.

Highlights: Contains hardware for communications between two
processors. Permits either processor and any channel to address all
processor storage.

Prerequisites: Multisubmissioning (#5050) on each 3037 in the
complex, plus:
• In a 3033 AP Complex -- a 3033 model A processor and a
3042 Attached Processor.
• In a 3033 MP Complex -- one or two 3033 model M
processors.

Bibliography: GC20-0001

SPECIFY
• Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or
#9905 for 230 V.
• Color: #9060 for willow green, #9061 for garnet rose, #9062
for sunrise yellow, #9063 for classic blue, #9064 for charcoal
brown, #9065 for pebble gray, or #9066 for pearl white.

PRICES: Mdl MRC 4 Yr Purchase MMMC
MLC 3038 1 $13,530 $12,300 $369,000 $340

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Machine Group: D Per Call: 3 Purchase Option: 50%
Warranty: A Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 25%
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

Metering: Base Unit (in a 3033 AP Complex -- meter on 3036
Console of 3033 mdl A ... in a 3033 MP Complex -- meter on 3036 of
first 3033 mdl M installed.)

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IBM 3041 ATTACHED PROCESSOR

Purpose: Provides Instruction/Execution Function, Buffer Control Function, and communication logic for a 3031 Attached Processor Complex.

Highlights
Can access up to 6 megabytes of monolithic processor storage on the host 3031 Processor A model ... 115 nanosecond processor cycle ... includes 32K bytes of high speed buffer storage ... Instruction/Execution Function similar to that of the 3031 Processor ... Buffer Control Function similar to that of the 3031 ... controlled by reloadable control storage.

Standard features include: Universal Instruction Set ... interval timer ... store and fetch protect ... byte oriented operand feature ... instruction retry ... dynamic address translation ... extended control mode ... program event recording ... time-of-day clock with clock comparator ... CPU timer ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... Extended Precision Floating Point ... Virtual Machine Assist (VMA) and OS/VS1 Extended Control Program Support (ECPS) when operating under VM/370 ... S/370 Extended Facility.

Prerequisites: The 3041 requires a 3031 Processor A model and a second 3017 Power Unit.

Bibliography: GC20-0001

SPECIFY

• Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, or #9005 for 230 V.
• Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.

MLC

Prices: Mdl MRC 4 Yr Purchase MMMC
3041 1 $12,820 $11,660 $335,000 $900

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: Assignable Unit
Maintenance: D
Per Call: 3
Purchase Option: 55%
Warranty: A
Useful Life Category: 2
Termination Charge Months: 6
Termination Charge Percent: 25%
Upper Limit Percent: 5%
Model/Feature Additional Charge in lieu of AU Charge: 15%

SPECIAL FEATURES

DIRECT CONTROL (#3274). Provides two instructions, "Read Direct" and "Write Direct", and six distinct external interrupt lines which are independent of data and channel operations. The read and write instructions provide timing signals and transfer a single byte between two cable-connected processing units, or a cable-connected processing unit and an external device. The read and write instructions must use real addresses only. Maximum: One.

Cable Order: Required. Field Installation: Yes. Prerequisites: External devices must meet the interface specifications outlined in S/370 - Direct Control Feature - OEM, GA22-6945.

Special Feature Prices:
MRC 4 Yr Purchase MMMC
Direct Control #3274 $104 $ 95 $3,700 $ 1.50

IBM 3042 ATTACHED PROCESSOR

Purpose: Provides arithmetic, logic, and control functions in a 3033 Attached Processor Complex.

Highlights: Can access up to 16,777,216 bytes of processor storage on the host 3033 Model A processor ... double-words are eight-way interleaved ... eight byte parallel data flow ... includes 65,536 bytes of 57 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective access time of storage ... buffer storage does not increase the amount of addressable storage ... 57 nanosecond processor cycle ... overlapped operation of instruction and execution functions ... extensive data checking.

Standard Features: Universal Instruction Set ... extended precision floating point ... one microsecond time-of-day clock with clock comparator ... one nanosecond processor timer ... dynamic address translation ... extended control mode ... program event recording ... byte-oriented operand feature ... buffer storage (65,536 bytes) ... fetch and store protection ... direct control feature ... S/370 Extended Facility ... reloadable control storage ... interval timer ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... channel-set switching and four instructions: signal processor ... set prefix ... store prefix ... store CPU address.

Prerequisites: The 3033 Attached Processor Complex requires a 3042 Attached Processor, a 3033 Model A processor, a 3038 Multiprocessor Communication Unit, two (2) 3036 Consoles, two (2) 3037 Power and Coolant Distribution Units (each with Multiprocessing (#5050)), and an approximate 415 Hz power input. Customer-supplied chilled water is required for cooling the system. See S/370 Installation Manual - Physical Planning, GC22-7004.

Bibliography: GC20-0001

SPECIFY

• Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9005 for 230 V.
• Motor Generator Set and Starter: If desired, see M 10000 pages for ordering instructions and prices.
• Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, #9065 for pebble gray, or #9066 for pearl white.
• RETAIN/370: The capability of using remote support/logout analysis facility is standard. Customer must provide interface for this facility to the telephone line if he desires to utilize this feature.

MLC

Prices: Mdl MRC 4 Yr Purchase MMMC
3042 1 $39,400 $35,820 $985,500 $2,750

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Maintenance: D
Per Call: 3
Warranty: A
Purchase Option: 50%
Useful Life Category: 2
Termination Charge Months: 6
Termination Charge Percent: 25%
Metering: Assignable Unit (meter on attached 3036)
Model/Feature Additional Charge in lieu of AU Charge: 15%
Upper Limit Percent: 5%

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# IBM 3046 Power Unit

**Purpose:** Provides power for a 3135, 3135-3 or 3138 Processing Unit, or for a 3345 Storage and Control model 1, 2, 4 or 5 with a 3145 Processing Unit model HG or I.

**Bibliography:** GC20-0001

**SPECIFY:**

- **[1]** Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, or #9905 for 230 V.
- **[2]** Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- **[3]** Cabling: #9080 for below the floor, or #9081 for on the floor.

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**Plan Offering:** Plan A, Additional Use Charge Rate: 10% Metering: Base Unit (meter on 3135, 3135-3 or 3145)

**Warranty:** B Useful Life Category: 2 Termination Charge Months: 6 Termination Charge Percent: 25%

**Model/Feature Additional Charge in lieu of AU Charge:** 15% Upper Limit Percent: 5%

---

# IBM 3047 Power Unit

**Purpose:** Provides power for a 3145 Processing Unit model H2, HG2, I2, I2, J2, J2 or K2, or 3145-3, 3148 Processing Unit.

**Bibliography:** GC20-0001

**SPECIFY:**

- **[1]** Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, or #9905 for 230 V.
- **[2]** Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- **[3]** Cabling: #9080 for below the floor, or #9081 for on the floor.
- **[4]** Field Conversion of a 3145 model FED, GE, GFD, H, HG or HG2, 12, or K2 will be made via RPQ.

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**Plan Offering:** Plan A, Additional Use Charge Rate: 10% Metering: Assignable Unit Machine Group: D

**Warranty:** A Useful Life Category: 2 Termination Charge Months: 6 Termination Charge Percent: 25%

**Model/Feature Additional Charge in lieu of AU Charge:** 15% Upper Limit Percent: 5%

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# 3052 Attached Processing Unit

**Purpose:** Provides arithmetic, logic, control and communication function for an Attached Processor System.

**Highlights:** Can access up to 6,291,456 bytes of monolithic processor storage on the host 3158 or 3158-3 ... 115 nanosecond processor cycle time provides the effective cycle time accessing the host storage. Sixteen general purpose and four floating point registers are implemented in high speed internal circuits with a four byte data flow. The APU functions are controlled by reloadable control storage.

**Standard features include:** Universal instruction set ... interval timer ... store and fetch protect ... byte oriented operand feature ... instruction retry ... dynamic address translation ... extended control mode ... program event recording ... time-of-day clock with clock comparator ... CPU timer ... compare and swap ... compare and swap ... insert PSW key ... set PSW key from address.

**PREREQUISITES:** The 3052 Attached Processor Unit model 1 requires (1) A 3158 or 3158-3 A series processing unit ... (2) A 3056 Remote System Console.

**Bibliography:** GC20-0001

**SPECIFY:**

- **[1]** Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, or #9905 for 230 V.
- **[2]** #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- **[3]** Cabling: #9080 for below the floor, or #9081 for on floor.
- **[4]** If two processors are installed and the 3052 is additional and emergency power off ability is required on the systems, then the extended Emergency Power Off Control (#3623) should be ordered for the host processor.

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**Plan Offering:** A, Additional Use Charge Rate: 10% Metering: Assignable Unit Machine Group: D

**Warranty:** A Useful Life Category: 2 Termination Charge Months: 6 Termination Charge Percent: 25%

**Model/Feature Additional Charge in lieu of AU Charge:** 15% Upper Limit Percent: 5%

**SPECIAL FEATURES**

**DIRECT CONTROL (#3274).** Provides two instructions, "Read Direct" and "Write Direct"; and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte between two cable-connected processing units, or a cable-connected processing unit and external devices. Maximum: One. Cable Order: Required. Field Installation: Yes. Prerequisites: External devices must meet the interface specifications outlined in S/370 - Direct Control Feature - OEM, GA22-6845.

**EXTENDED PRECISION FLOATING POINT (#3700).** Provides instructions to handle extended precision (25-hexadecimal digit fraction) floating point operands. Extended precision operands may also be rounded to long-precision format, which in turn may be rounded to short-precision format. Field Installation: Yes. 1401/1440/1460, 1410/7010 COMPATIBILITY (#3950). Provides the system with the ability to execute 1401/1440/1460 and 1410/7010 instructions under specific conditions and matching configurations ... see P 360N pages for DOS and P 360C pages for OS. Field Installation: Yes. Limitation: This feature cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730).

**OS/DOS COMPATIBILITY (#5450).** Provides the system with the ability to execute DOS programs under specific conditions ... see P 360C pages in "Programming". Field Installation: Yes. Limitation: This feature cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730).

**PROCESSOR ATTACH (#5552).** Provides additional storage protect capability required when the APU is attached to a model A-Series processing unit whose storage size is over one megabyte. One feature is required for each megabyte of storage in the A-Series processor above one megabyte, e.g.

---

*† Purchase Option is 50% under Term Lease Plan (TLP)*

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IBM 3058 MULTISYSTEM UNIT

Purpose: Control unit used in configuring a S/370 mtl 158 Multi-processor System. One is required for each system containing one or two 3158/3158-3 multiprocessor models.

Highlights: Permits two 3158/3158-3 multiprocessor units to be interconnected to form a multiprocessing system. Contains configuration control facilities for mode of operation (MP/UP), storage address assignment, and attachment of I/O control units having the remote switch attachment feature.

PREREQUISITES: One or two 3158 multiprocessor models ... I/O control units which are to be connected to the I/O assignment switches on the configuration control panel must have the two channel switch feature and the remote switch attachment feature.

Field Installation: Yes.

Bibliography: GC20-0001

SPECIFY: [1] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.


Symmetrical Processors Feature
MP1 or M31 #9501
MP2 or M32 #9502
MP3 or M33 #9503
MP4 or M34 #9504
MP5 or M35 #9505
MP6 or M36 #9506

Asymmetric Processors

Left Processor Feature
Right Processor Feature
M32 #9181 M32 #9182
M34 9183 M34 9184
M35 9185 M35 9186
M36 9187 M36 9188
M37 9188 M37 9190
M38 9191 M38 9192

PRICES: Mdl MRC 4 Yr Purchase MMMC
3058 1 $1,370 $1,250 $46,990 $21.50

Plan Offering: Plan A, Additional Use Charge Rate: 10% Metering: Base Unit (meter on 1st 3158 mtl MP or M3 installed) Maintenance: C Per Call: 3 Purchase Option: 55%† Warranty: A Useful Life Category: 2

Termination Charge Months: 6 Termination Charge Percent: 25% Model/Feature Additional Charge in lieu of AU Charge: 15% Upper Limit Percent: 5%

SPECIAL FEATURES

I/O ASSIGNMENT SWITCH EXPANSION (#4600). Adds an additional 14 assignment switches to the basic 14 on the configuration panel of the 3056. Maximum: One. Field Installation: Yes.

TLP/ MAC/ MLC
Special Feature Prices: MRC 4 Yr Purchase MMMC
I/O Assign Sw Expan #4600 $112 $102 $5,495 $ 1

† Purchase Option is 50% under Term Lease Plan (TLP)
IBM 3060 SYSTEM CONSOLE
[No Longer Available]

Purpose: Provides the switches and lights necessary to operate the S/360 mdl 195 or S/370 mdl 195.

Highlights: One unit is used with each 3195 Processing Unit. Data can be entered into processor storage or into internal registers by keys and switches. Contents of storage or internal registers of the mdl 195 can be displayed. Basic maintenance tests of the processor, including storage, can be operated from the console. A display console is included which is functionally equivalent to a 2250 mdl 1 with the following features: Alphanemic keyboard, 8K buffer (4K is maintenance only), character generator, light pen, and OCP-First. The display console and Operator Console Panel which are included may be used as an operator's console.

PREREQUISITE: A control unit position on a 2860, 2870 with Selector Subchannel (special feature), or a non-shared subchannel of a 2860.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

SPECIAL FEATURES
The following special feature is on an "as available" basis for field installation.

OPERATOR CONTROL PANEL - SECOND (#5467). Provides a duplicate of the on/off and program load facilities (OCP) of a second processing unit. Maximum: One.

IBM 3062 ATTACHED PROCESSING UNIT
Purpose: Provides arithmetic, logic, control, and communication function for an Attached Processor System.

Highlights: Can access up to 8,388,608 bytes of monolithic processor storage on the host 3168-3 ... eight byte parallel data flow ... includes up to 32,768 bytes of 60 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective cycle time of storage ... buffer storage does not increase the amount of addressable storage ... 80 nanosecond processor cycle ... double-words are four-way interleaved ... overlapped operation of instruction and execution units ... extensive data checking is coupled with 3168-3 reliability, availability and serviceability. Improved availability and serviceability through a service processor.

Standard Features: Universal instruction set ... extended precision ... one-microsecond time-of-day clock with clock comparator ... one-microsecond CPU timer ... dynamic address translation ... extended control mode ... program event recording ... additional variable field length instructions ... control registers, expanding the functions of PSWs ... byte oriented operand feature ... buffer storage (32,768 bytes) ... fetch and store protection ... fileable control storage ... internal timer ... storage error checking and correction ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address store CPU ID, additional instructions on the APU signal processor ... set prefix store prefix ... store CPU address.


[6] Special features on the 3062 must match those on the 3168 for a normal installation. When special features do not match, RPQ must be ordered for the 3168.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9044 for gray, or #9046 for white.


[4] If two processors are installed and the 3062 is added and emergency power off ability is required on the systems, then the extended Emergency Power Off Control (#3634) should be ordered for the host processor.

PRICES: Mdl MRC 4 Yr Purchase MMMC

3062 1 $53,000 $48,190 $1,075,000 $5,100

Plan Offering: Plan A, Additional Use Charge Rate; 10% Metering: Non-assignable (runs with Processor) Machine Group: D Per Call: 3 Purchase Option: 55% Warranty: A Useful Life Category: 1 Termination Charge Months: 6 Termination Charge Percent: 25% Model/Feature Additional Charge in lieu of AU Charge: 15% Upper Limit Percent: 5%

SPECIAL FEATURES
HIGH SPEED MULTIPLY (4525). Improves AU speed in both fixed and floating point multiply operations. Field Installation: Not recommended. Prerequisites: High Speed Multiply (#4525) on the 3066 System Console mdl 3 and on the 3067 Power and Coolant Distribution Unit mdl 5.

SYSTEM/370 EXTENDED (#7730). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. Field Installation: Yes. Prerequisites: System/370 Extended (#7730) on the A-series processor or on a 3168 with RPQs (Performance Improvements) and (APU Attach).
IBM 3066 SYSTEM CONSOLE - MODEL 1

[The 3066 model 1 is no longer available ... features and model changes can be ordered on an "as available" basis.]

Purpose: Provides the switches, lights, display and control functions for a S/370 mdl 165.

Highlights: One 3066 mdl 1 is used with each 3165 Processing Unit. Data can be entered into processor storage or into internal registers by keys and switches. Contents of storage or internal registers of the system can be displayed.

Basic maintenance tests of the processor, including storage, can be operated from the console. A display console with a 4K buffer, an input keyboard, and associated control logic combine to provide a complete console I/O function. In normal mode, the CRT and the alphanumeric keyboard are designed to be used as the operator’s console.

Also included is a microfiche projection display, a microfiche document viewer, a main storage configuration plugboard, a systems activity monitor, and a device for inputting microcode from a magnetic disk cartridge to the writable control storage.

PREREQUISITE: A control unit position on a 2860 Selector Channel, 2870 Basic Multiplexer Channel, 2870 Selector Subchannel (special feature), or a non-shared subchannel of a 2860 Block Multiplexer Channel ... see 2860, 2870, 2880.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

PRICES:

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<tbody>
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<td>$126,150 552</td>
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</table>

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Voltage: AC, 3-phase, 4-wire, 208 V, 230 V.

Field Installation: Yes. Prerequisite: Basic Multiplexer Channel, #7117) on the 3165 Processing Unit. Field Installation: Not recommended. Prerequisite: #7070/7074 Compatibility (#7117) on the 3165 and on the 3067 Power and Coolant Distribution Unit mdl 1.

7070/7074 COMPATIBILITY (#7117). Required if feature #7117 is installed on the 3165 Processing Unit. Field Installation: Not recommended. Prerequisite: #7070/7074 Compatibility (#7117) on the 3165 and on the 3067 Power and Coolant Distribution Unit mdl 1.

7080 COMPATIBILITY (#7118). Required if feature #7118 is installed on the 3165 Processing Unit. Field Installation: Not recommended. Prerequisite: #7080 Compatibility (#7118) on the 3165 and on the 3067 Power and Coolant Distribution Unit mdl 1.

7097/7090/7094/7094 II COMPATIBILITY (#7119). Required if feature #7119 is installed on the 3165 Processing Unit. Field Installation: Not recommended. Prerequisite: #7097/7090/7094/7094 II Compatibility (#7119) on the 3165 and on the 3067 Power and Coolant Distribution Unit mdl 1.

IBM 3066 SYSTEM CONSOLE - MODEL 2 AND 3

Purpose: Provides the switches, lights, display and control functions for a S/370 mdl 168.

Highlights: One 3066 mdl 2 is used with each 3168/3168-3 Processing Unit. Data can be entered into processor storage or internal registers by keys and switches. Contents of storage or internal registers of the 3168/3168-3 can be displayed.

Basic maintenance tests of the processor, including storage, can be operated from the console. A display console with a 4K buffer, an input keyboard, and associated control logic combine to provide a complete console I/O function. In normal mode, the CRT and the alphanumeric keyboard are designed to be used as the operator’s console.

Also included is a microfiche projection display, a microfiche document viewer, a main storage configuration plugboard, a systems activity monitor, and a device for inputting microcode from a magnetic disk cartridge to the writable control storage.

A 3066 mdl 3 is used with each 3168-3 A series to support a 3062-1 APU.

PREREQUISITE: A control unit position on a 2860 Selector Channel, 2870 Basic Multiplexer Channel, 2870 Selector Subchannel (special feature), or a non-shared subchannel of a 2860 Block Multiplexer Channel ... see 2860, 2870, 2880.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

3168-3 Attachment: #9650 ... req’d to attach a 3168-3 Processing Unit.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges.)

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<tr>
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SPECIAL FEATURES

HIGH SPEED MULTIPLY (#4525). Required if feature #4525 is installed on the 3168/3168-3 Processing Unit. Field Installation: Yes. Prerequisite: High Speed Multiply (#4525) on the 3168/3168-3 and on the 3067 Power and Coolant Distribution Unit mdl 2 or 3.

MULTIPROCESSING (#5050). Required if the 3066 mdl 2 is used with a 3168 or 3168-3 multiprocessor model. Field Installation: Yes.

POWER WARNING (#5760). Provides signal to the 3168/3168-3 system when power is outside specified limits. Prerequisites: All models require customer supplied uninterruptible power supply with the sensor. Multiprocessing models also require special cable ... consult physical planning representative. Field Installation: Yes.

7070/7074 COMPATIBILITY (#7127). Required if feature #7127 is installed on the 3168/3168-3 Processing Unit. Field Installation: Not recommended. Prerequisite: #7070/7074 Compatibility (#7127) on the 3168/3168-3 and on the 3067 Power and Coolant Distribution Unit mdl 2 or 3.

7080 COMPATIBILITY (#7128). Required if feature #7128 is installed on the 3168/3168-3 Processing Unit. Field Installation: Not recommended. Prerequisite: #7080 Compatibility (#7128) on the 3168/3168-3 and on the 3067 Power and Coolant Distribution Unit mdl 2 or 3.

7097/7090/7094/7094 II COMPATIBILITY (#7129). Required if feature #7129 is installed on the 3168/3168-3 Processing Unit. Field Installation: Not recommended. Prerequisite: #7097/7090/7094/7094 II Compatibility (#7129) on the 3168/3168-3 and on the 3067 Power and Coolant Distribution Unit mdl 2 or 3.

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3067 POWER and COOLANT DISTRIBUTION UNIT - MODEL 1

[The 3067 model 1 is no longer available. Features and model changes can be ordered on an "as available" basis.]

Purpose: Provides power and coolant distribution control required by a S/370 model 165.

Highlights: One 3067 model 1 is used with each 3165 Processing Unit.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9042 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Channel Frames: The number of channel frames specified on the power distribution unit must be equal or greater than the channel frames actually attached. Required for channel frame attachment are the following:

- #9132 for 2nd channel frame
- #9133 for 3rd channel frame ... #9132 required
- #9134 for 4th channel frame ... #9133 required
- #9135 for 5th channel frame ... #9134 required
- #9136 for 6th channel frame ... #9135 required
- #9137 for 7th channel frame ... #9136 required

Note: Customers who may elect to purchase and have present or future requirements for seven channel frames should order #9132 thru #9137.

**PRICES:**

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Plan Offering: Plan A, Additional Use Charge Rate: 10% Metering: Base Unit (meter on 3066 mdl 1)

Maintenance: A

Useful Life Category: 1 Warranty: B

Model Changes: Model 2 can be changed to Model 3 in the field.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model 1 to Model 2 ... $3,040

**SPECIAL FEATURES**

**BUFFER EXPANSION (#1432).** Required if feature #1432 is installed on the 3165 Processing Unit. Field Installation: Yes.

**HIGH SPEED MULTIPLY (#4520).** Required if feature #4520 is installed on the 3165 Processing Unit. Field Installation: Not recommended. Prerequisite: High Speed Multiply (#4525) on the 3168 and on the 3066 System Console mdl 2.

**7070/7074 COMPATIBILITY (#7117).** Required if feature #7117 is installed on the 3165 Processing Unit. Field Installation: Not recommended. Prerequisite: High Speed Multiply (#4520) on the 3165 and on the 3066 System Console mdl 1.

**7080 COMPATIBILITY (#7118).** Required if feature #7118 is installed on the 3165 Processing Unit. Field Installation: Not recommended. Prerequisite: 7080 Compatibility (#7118) on the 3165 and on the 3066 System Console mdl 1.

**709709/7094/7094 II COMPATIBILITY (#7119).** Required if feature #7119 is installed on the 3165 Processing Unit. Field Installation: Not recommended. Prerequisite: 709709/7094/7094 II (#7119) on the 3165 and on the 3066 System Console mdl 1.

**SPECIAL FEATURES**

**BUFFER EXPANSION (#1435).** Required if feature #1435 is installed on the 3168 Processing Unit. Field Installation: Yes.

**HIGH SPEED MULTIPLY (#4525).** Required if feature #4525 is installed on the 3165 Processing Unit. Field Installation: Not recommended. Prerequisite: High Speed Multiply (#4525) on the 3168 and on the 3066 System Console mdl 2.

**7070/7074 COMPATIBILITY (#7127).** Required if feature #7127 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 7070/7074 Compatibility (#7127) on the 3168 and on the 3066 System Console mdl 2.

**7080 COMPATIBILITY (#7128).** Required if feature #7128 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 7080 Compatibility (#7128) on the 3168 and on the 3066 System Console mdl 2.

**709709/7094/7094 II COMPATIBILITY (#7129).** Required if feature #7129 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 709709/7094/7094 II (#7129) on the 3168 and on the 3066 System Console mdl 2.

**SPECIAL FEATURES**

**BUFFER EXPANSION (#1435).** Required if feature #1435 is installed on the 3168 Processing Unit. Field Installation: Yes.

**HIGH SPEED MULTIPLY (#4525).** Required if feature #4525 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: High Speed Multiply (#4525) on the 3168 and on the 3066 System Console mdl 2.

**7070/7074 COMPATIBILITY (#7127).** Required if feature #7127 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 7070/7074 Compatibility (#7127) on the 3168 and on the 3066 System Console mdl 2.

**7080 COMPATIBILITY (#7128).** Required if feature #7128 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 7080 Compatibility (#7128) on the 3168 and on the 3066 System Console mdl 2.

**709709/7094/7094 II COMPATIBILITY (#7129).** Required if feature #7129 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 709709/7094/7094 II (#7129) on the 3168 and on the 3066 System Console mdl 2.

**SPECIAL FEATURES**

**BUFFER EXPANSION (#1435).** Required if feature #1435 is installed on the 3168 Processing Unit. Field Installation: Yes.

**HIGH SPEED MULTIPLY (#4525).** Required if feature #4525 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: High Speed Multiply (#4525) on the 3168 and on the 3066 System Console mdl 2.

**7070/7074 COMPATIBILITY (#7127).** Required if feature #7127 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 7070/7074 Compatibility (#7127) on the 3168 and on the 3066 System Console mdl 2.

**7080 COMPATIBILITY (#7128).** Required if feature #7128 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 7080 Compatibility (#7128) on the 3168 and on the 3066 System Console mdl 2.

**709709/7094/7094 II COMPATIBILITY (#7129).** Required if feature #7129 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 709709/7094/7094 II (#7129) on the 3168 and on the 3066 System Console mdl 2.

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3067 POWER and COOLANT DISTRIBUTION UNIT - MODEL 2

Purpose: Provides power and coolant distribution control required by a S/370 model 165.

Highlights: One 3067 model 2 is used with each 3168 Processing Unit.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

**SPECIAL FEATURES**

**BUFFER EXPANSION (#1435).** Required if feature #1435 is installed on the 3168 Processing Unit. Field Installation: Yes. Prerequisite: Buffer Expansion (#1435) on the 3168.

**HIGH SPEED MULTIPLY (#4525).** Required if feature #4525 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: High Speed Multiply (#4525) on the 3168 and on the 3066 System Console mdl 2.

**7070/7074 COMPATIBILITY (#7127).** Required if feature #7127 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 7070/7074 Compatibility (#7127) on the 3168 and on the 3066 System Console mdl 2.

**7080 COMPATIBILITY (#7128).** Required if feature #7128 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 7080 Compatibility (#7128) on the 3168 and on the 3066 System Console mdl 2.

**709709/7094/7094 II COMPATIBILITY (#7129).** Required if feature #7129 is installed on the 3168 Processing Unit. Field Installation: Not recommended. Prerequisite: 709709/7094/7094 II (#7129) on the 3168 and on the 3066 System Console mdl 2.
3067 POWER AND COOLANT DISTRIBUTION UNIT - MODEL 3

**Purpose:** Provides power and coolant distribution control required by a 5/370 model 168.

**Highlights:** One 3067 model 3 is used with each 3168-3 Processing Unit.

**Bibliography:** GC20-0001

**SPECIFY:** [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 206 V, or #9905 for 230 V.

**2** Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

---

3068 MULTISYSTEM COMMUNICATION UNIT

**Purpose:** Control unit used in configuring a S/370 model 168 multiprocessor system. One is required for each system containing one or two 3168/3168-3 multiprocessor models.

**Highlights:** Contains hardware for communications between two S/370 model 168 multiprocessor processors together with configuration control facilities for mode of operation (MP/UP), storage address assignment, and attachment of I/O control units having the remote switch attachment feature.

**PREREQUISITES:** One or two 3168/3168-3 multiprocessor models... I/O control units which are to be connected to the I/O assignment switches on the configuration control panel must have the two channel switch feature and the remote switch attachment feature.

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**3080 POWER UNIT**  
[No Longer Available]

**Purpose:** Provides power for the S/360 mdl 195 or S/370 mdl 195.

**Highlights:** One unit of each model of the 3080 is used with each 3195 Processing Unit. Model 1 provides power for the Floating Point Execution Element... Model 2 provides power for the Fixed Point and Variable Field Length Execution Element... Model 3 provides power for the Instruction Processor and the Storage Control Unit.

**Bibliography:** GC20-0001

**SPECIFY:**

1. Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
2. Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

---

**3085 POWER DISTRIBUTION UNIT**  
[No Longer Available]

**Purpose:** Provides power control and distribution for a S/360 mdl 195 or S/370 mdl 195.

**Highlights:** One unit is used with each 3195 Processing Unit.

**Bibliography:** GC20-0001

**SPECIFY:**

1. Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
2. Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

---

**3086 COOLANT DISTRIBUTION UNIT**  
[No Longer Available]

**Purpose:** Provides distribution control for coolant required by the S/360 mdl 195 or S/370 mdl 195.

**Highlights:** One unit is used with each 3195 Processing Unit.

**PREREQUISITE:** Customer-supplied chilled water is required for the cooling system. See S/360 Installation Manual - Physical Planning, GC22-6820.

**Bibliography:** GC20-0001

**SPECIFY:**

1. Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
2. Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.


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IBM 3115 PROCESSING UNIT

Purpose: Provides main and control storage, plus arithmetic and logic circuits for a S/370 mdl 115 including a direct disk attachment.

The 3115-0 and 3115-2 Processing Units are available in the following model groups:

**Models:**
- **3115-0**
  - **3115-2** Processor Storage Size
  - **F**
    - F2 65,536 bytes
  - **FE**
    - FE2 98,304 bytes
  - **G**
    - G2 131,072 bytes
  - **GE**
    - GE2 163,840 bytes
  - **GF**
    - GF2 196,608 bytes
  - **H2**
    - 262,144 bytes
  - **HG2**
    - 393,216 bytes

For differences between the two model series refer to the "Systems" pages.

**NOTE:** If 3411 Magnetic Tape and Control is attached see Magnetic Tape Adapter special feature paragraph for RPQ requirement.

**Highlights:** Depending upon the model, 65,536 to 393,216 bytes of processor storage are available. The basic main memory cycle time is 480 nanoseconds for 2 bytes. Sixteen general, sixteen control and four floating point registers are provided. The system design provides the distributed microencoded processors within the Central Processing Unit for the independent handling of programs, input/output processing and diagnostic/maintenance. Direct attachment of the 3340 DAS Subsystem or the 3340/3344 DAS Subsystem (3115-2 only) is provided. Depending on model and features up to eight drives can be attached. In a 3340 DAS Subsystem, via the string switch capability (#3515), the 3340 mdl A2 can be added with another S/370, except 3115-0 and 3125-0. For details and restrictions refer to the Direct Disk Attachment paragraph.

The 2311 Mdl 1/3340 - Series and the 2314/3340 - Series Compatibility features are available as options. They are mutually exclusive. Emulation is under DOS and DOS/VS only. 2311 mdl 1 emulation under DOS/VS requires SYS/SRES on 3340.

Capability to attach the 3803/3420 or 3411/3410 magnetic tape subsystem model 1, 2 or 3 via the optional Magnetic Tape Adapter.

Capability to natively attach one of the following card I/O: 2560 mdl A1 or A2, or the 5425 mdl A1 or A2 (66 column card) via the optional Integrated Card I/O Attachment features.

Capability to attach a wide variety of I/O devices via the optional Byte Multiplexer Channel. **NOTE:** The Integrated Card I/O Attachment and the Byte Multiplexer Channel cannot be installed on the same system if a remote workstation with HASP-RMT/360 is installed.

The optional 1052 Compatibility feature is available to emulate the 1052 Printer keyboard in the S/370 mdl 115. 1052 Compatibility (#8005) in combination with the 5213 Printer mdl 1 allows the model 115 to be used as a remote workstation with HASP-RMT/360. **NOTE:** The 1052 compatibility mode is not supported under DOS/VS. With DOS/VS, the 5213 mdl 1 will act as a slave unit to the DCC.

Capability to attach up to 5 asynchronous lines, or up to 4 synchronous and up to 8 asynchronous lines is provided by the optional Integrated Communications Adapter with appropriate features.

Capability to attach the 5203 Printer mdl 3 or 3203 Printer mdl 1 or 2 is provided with optional Integrated Printer Attachment features.

The optional S/360 Model 20 and 1401/1440/1460 Compatibility features are available to allow execution of the instructions of those programs.

The Display Operator Console (DOC) is an integral part of the S/370 mdl 115 and enhances operator-machine communications. Data can be entered into main storage or into internal registers via the keyboard. Contents of storage or internal registers of the S/370 mdl 115 can be shown on the video screen with 16 lines of 56 characters/line. A portion of the screen is reserved to display machine status. The Service Processor (SVP) continuously monitors system operation and logs errors on the removable magnetic IBM Diskette device. The SVP initiates recovery on detection of error conditions and provides control for the display, keyboard, console file and optional console printer.

The standard console file is the basic microprogram loading device for the system. It contains a small file device, which reads and writes on a removable magnetic IBM Diskette. The diskettes that will be supplied with the system will contain the required microcode for the basic system, the optional features ordered for the system, and CE diagnostics.

The CE logout of machine and I/O related control checks and errors are recorded on the diskette for CE diagnosis, to enhance the reliability, availability, and serviceability of the S/370 mdl 115.

Dynamic Address Translation (DAT) is a standard facility on the model 115. Since logical storage addressing is not limited by the amount of available real storage, program size may exceed real storage size. This logical storage is referred to as "virtual storage" and may be as large as 16,777,216 bytes on the model 115.

Standard features include S/370 commercial instruction set, Extended Control (EC) Mode, Dynamic Address Translation, Channel, Indirect Data Addressing, Program Event Recording (PER), Monitor Call, internal timer, time-of-day clock, CPU-Timer and Clock Comparator, store and fetch protect, byte oriented operand features, error checking and correction of single bit errors on main storage, and Audible Alarm.

**Control Storage:** On the 3115-0, reordable control storage for the Service Processor (SVP), and Direct Disk Attachment and the basic part of the Machine Instruction Processor (MIP) is provided as standard on the 3115 Processor Unit. In addition, reordable control storage is provided with the optional Card I/O Attachment. Processor, Attachment, Integrated Communications Adapter (ICA), Byte Multiplexer Channel. The MIP contains as standard, 20K words of 22 bits of control storage and may be expanded either to 24K words (8K Control Storage Extension, #4101) or to 28K words (8K Control Storage Extension, #4104). #4101 and #4104 are mutually exclusive. See Chart A below for possible feature combinations and control storage requirements.

**NOTE:** Customers who elect to purchase the 4K Control Storage Extension and later upgrade to the 8K Control Storage Extension should consider the purchase of the 8K Control Storage Extension in combination because this field upgrade requires replacement of the 4K Control Storage Extension and installation of the 8K Control Storage Extension. This is, however, not recommended for customers considering to eventually convert to a 3115-2.

On the 3115-2, the Instruction Processing Unit (IPU) contains as standard, 12K words of control storage. Certain feature combinations can use up to two additional 4K words increments totaling 28K words of control storage. See Chart B for details.

**Chart A:** Listed below are the valid feature combinations and their respective requirements for additional control storage on the 3115-0:

<table>
<thead>
<tr>
<th>Optional Features -- Model 3115-0</th>
<th>Basic Control Storage</th>
<th>4K Control Storage...</th>
<th>BK Control Storage...</th>
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<tbody>
<tr>
<td>Floating Point #3900 **</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Floating Point Incl Ext Precision #3910 **</td>
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<tr>
<td>5/360 Md 20 Comp tabs #7520</td>
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<td>x</td>
<td>x x x x x x x x x x</td>
</tr>
<tr>
<td>2311-1/3340 Series Comp tabs #8060 ***</td>
<td>x</td>
<td></td>
<td>x x x x x x x x x x x x x x x x</td>
</tr>
<tr>
<td>2314/2340 Series Comp tabs #8070 ***</td>
<td></td>
<td>x</td>
<td></td>
</tr>
</tbody>
</table>

* #4101 and #4104 are mutually exclusive. ** #3900 and #3910 are mutually exclusive. *** #8060 and #8070 are mutually exclusive. In addition, #8060 and #8070 are mutually exclusive with spec #9190.

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Input/Output Attachments - Native: The following integrated I/O attachments/adapters are provided for controlling the designated I/O devices. They are designed to interact with their respective I/O devices and should be installed/removed with them since the system is inoperative with only the attachment/installer

Direct Disk Attachment (standard) — this attachment is provided to attach the 3340 mld A2 dual drive unit and control directly to the S/370 mld 115. The attachment is addressed as channel 1. This attachment provides block multiplexing. 3340 DASD SUBSYSTEM. On the 3115-0 one 3340 mld A2 and one 3340 mld B2/B1 can be attached to provide up to four spindles. On the 3115-2 (w/o 3344 Attachment #9317) one 3340-A2 and up to three 3340 mld B1/B2s can be attached to provide up to eight spindles. 3340/3344 DAS SUBSYSTEM. On the 3115-2 with 3344 Attachment #9317 installed: One 3340 mld A2 and any combination of up to three 3340 mld B1/B2s and 3344 mld B2/BSs can be attached. With the String Switch (#8150) installed, the 3340 mld A2 may be shared with another S/370 except 3115-0 and 3125-0. Specify Fixed Head Attachment (#9315) or 3344 Attachment (#9317) are mutually exclusive. String Switch capability is not supported on a 3344 configuration. 4K DASD Control Storage Extension is required when either is installed. Specify Fixed Head Attachment (#9190) if Fixed Head Feature is installed on 3340 Series drives. See Chart A for control station requirements.

Magnetic Tape Adapter (optional) — this feature attaches one of the following tape control units and is addressed as channel 2: 3411 Magnetic Tape Unit and Control mld 1° — tape control (20KB) housing one tape drive. Up to three 3410 Magnetic Tape Units mdls 1-3 may be attached to the 3411 mld 1. 3411 Magnetic Tape Unit and Control mld 2° — tape control (40KB) housing one tape drive. Up to five 3410 Magnetic Tape Units mdls 2s may be attached to the 3411 mld 2. 3411 Magnetic Tape Unit and Control mld 3° — tape control (80KB) housing one tape drive. Up to five 3410 Magnetic Tape Units mdls 2s may be attached to the 3411 mld 3. 3803 Tape Control mld 3° — up to eight 3420 mld 3 (120KB) or mld 5 (200KB) may be attached to the 3803.

Integrated Card I/O Attachments (optional) — these features provide native attachment of one of the following: 2560 Multi-function Card Machine mdls A1 or A2. 5425 Multi-function Card Unit Card mld A1 or A2. The Integrated Card I/O Attachment uses channel 0. Device address X'00D' is reserved for the 5460 or 5425.

Integrated Printer Attachment (optional) — attachment features for the 5203 Printer mld 3 or the 3203 Printer mld 1 or 2 are provided. One printer unit may be natively attached. The printer attachment as addressed as channel O and the device address is X'00E'. The Universal Character Set (UCS) control is standard on the 3203. On the 5203, UCS control may be specified on Integrated 5203 Mld 3 Attachment (#4690).

Integrated Console Printer Attachment (optional) — attaches the 5213 Printer mld 1 to the 3115 to provide hardcopy of operator messages presented on the standard Display Operator Console. It uses address X'01F' (same as the Display Operator Console) on Channel 0. When the 1052 Compatibility feature is installed, the 5213 Printer mld 1 is required.

Integrated Communications Adapter (optional) — provides the basic control storage and common circuits for direct attachment of up to five synchronous (BSC) communications lines OR up to eight asynchronous (start/stop) lines. See individual ICA features for limitations. The Integrated Communications Adapter Extension (ICA) provides the capability to attach up to four BSCs AND up to eight start/stop lines. IBM line adapters are provided within the model 115.

Input/Output Channel:

Byte Multiplexer Channel (Optional) — provides for the attachment of a wide variety of low speed devices. The single channel available on the S/370-115 is functionally equivalent to the Byte Multiplexer Channel on S/360 mdls 22, 25, 30 and 40 and provides for a maximum of up to 8 control unit positions. 32 subchannels are provided as standard and are divided into 8 shared and 24 unshared subchannels.

The Integrated Card I/O Attachments and the Byte Multiplexer Channel cannot be installed together on the same system unless RPQs are installed.

Console Function — system control functions are provided by the standard integrated Display Operator Console or by RPQs.

String Switch capablity is not supported on a 3344 configuration. 4K DASD Control Storage Extension is required. Cannot be installed with any of the S/370-115. RPQs are installed.

NOTE: The string switch of the DASD hardware function can be operated with the present DOS/VS standard DASD support. DOS/VS does not support the device reserve/release channel commands for program controlled sharing of attached DASD units. Therefore, it is the user's responsibility by appropriate organization and programming procedures to resolve conflicting references to shared files and insure data integrity. One method for controlling potential conflicts involves the use of operator commands DUC VP/DUC DN. For additional information, consult DOS/VS System Management Guide, GC33-S371.

On the 3115-2 specify 3344 Attachment (#9317) if attaches to 3344 mld 32/3227 are installed. 4K DASD Control Storage Extension is required. Cannot be installed with any of the following: String Switch Capability (#9190), 231X/3340 Compatibility (#8060) or 2314/3340 Series Compatibility (#8070).


CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any diskette-only changes ordered on same diskette.
**3115 Processing Unit (cont’d) only): External Signal (53898) is required to attach a 1255, 1259, or 1419.


**NOTE: RETAIN/370... CE access is by telephone.**

### PRICES

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<tr>
<th>Model</th>
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<th>3115-2</th>
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### SPECIAL FEATURES

**EXPANSION BASE (#3860):** [3115-2 only] Provides additional gate and blowers, and is required if RPOs are not installed for all model H2s and HG2s. - for models F2, FE2, G2, G2, or GF2 if a Line Adapter Base 2 (#4792) or Line Adapter Base 3 (#4793) is required.

**EXTERNAL SIGNALS (#3898):** Provides six distinct external interrupt lines to request and identify an external interrupt response from the processing unit. **Maximum:** One per 3115. **Cable Order:** Required. **Field Installation:** Yes. **Prerequisite:** External devices must meet the interface specifications outlined in S-380 - Direct Control Feature - OEM 1, SRL GA22-6845.

**FLOATING POINT (#3900):** [3115-0 only] Provides 44 floating point arithmetic instructions ... these instructions with the standard set make up the Scientific Instruction Set. **Field Installation:** Yes. **Limitation:** Cannot be installed with Floating Point Including Extended Precision (#3910).

**FLOATING POINT INCLUDING EXTENDED PRECISION (#3910):** Adds 51 floating point arithmetic instructions ... provides for floating point operation including extended precision to 28 hexadecimal digits. **Field Installation:** Yes. **Limitation:** Cannot be installed with Floating Point (#3900). **Prerequisite:** See Chart A/B above for control storage requirements.

**4K CONTROL STORAGE EXTENSION (#4101):** Adds 4,096 words (22 bits wide) of control storage to the Machine Instruction Processor (3115-0) or Instruction Processor (3115-2) as required for certain feature combinations ... see Chart A/B above for details. **Limitation:** Cannot be installed with 8K Control Storage Extension (#4104). **Field Installation:** Yes. **See “Note” following “Field Installation” for 8K Control Storage Extension (#4104) below.

**4K CONTROL STORAGE INCREMENT - 2nd (#4102):** [3115-2 only] Expands the IPU control storage by 4,096 words (22 bits wide) Required for certain feature combinations ... see Chart A/B above for details. **Limitation:** Cannot be installed with #4210 or specify feature #9315. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** 4K Control Storage Extension (#4101).

**8K CONTROL STORAGE EXTENSION (#4104):** [3115-0 only] Adds 8,192 words (22 bits wide) of control storage to the Machine Instruction Processor. Required for certain feature combinations ... see Chart A above for details. **Limitation:** Cannot be installed with 4K Control Storage Extension (#4101). **Field Installation:** Yes. **Note:** Customers who may elect to purchase the 4K Control Storage Extension and later upgrade to the 8K Control Storage Extension should consider the purchase of the 8K Control Storage Extension initially because this field upgrade replaces the 4K Control Storage Extension and installation of the 8K Control Storage Extension.

**4K DASF CONTROL STORAGE EXTENSION (#4210):** [3115-2 only] Adds 4,096 words (22 bits wide) to the DDA control storage required for string switching capability specified (#9315) or 3344 Attachment specify feature (#9317). **Limitation:** Cannot be installed with #4102 or #4460. **Maximum:** One. **Field Installation:** Yes.

1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with an emulator program under DOS/VS, permits the system to execute 1401/1440/1460 instructions. **Field Installation:** Yes. **Prerequisite:** See Chart A/B above for control storage requirements. **Note:** On the 3115-2. #1457 and S/370 Md1 20 Compatibility (#7520) are mutually exclusive (may not be ordered on the same system unless RPOs are installed). **Limitation:** Cannot be installed with 3344 Attachment (#9317).

1403/3203 CARRIAGE CONTROL FEATURE (#4460). Allows the 3203 Printer with its tapeless carriage control to emulate the function of a tape controlled carriage and thus run programs written for a 1403 Printer. **Limitation:** The 5203 Printer is not supported by this feature. Cannot be installed with string switch capability (#9315) or 3344 Attachment specify feature (#9317). **Field Installation:** Yes. **Prerequisite:** 3203 Printer. **Note:** This feature is not required with DOS/VS Release 31 and subsequent releases.

INTEGRATED 3203 PRINTER ATTACHMENT (#4465). Control for attaching the 3203 Printer md1 1 or 2. The Universal Character Set is Standard. **Specify:** #9770 for md1 1, or #9771 for md1 2. **Limitation:** Cannot be installed with Integrated 5203 Attachment (#4690). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** Integrated 3203/5203 Printer Prerequisite (#4653).

**INTEGRATED 3203/5203 PRINTER PREREQUISITE (#4653):** Provides a common control base for attaching either the 3203 or 5203 Printer. Required as a feature for installation of the Integrated 3203 PRINTER Attachment (#4650) or Integrated 5203 PRINTER Attachment (#4690). **Maximum:** One. **Field Installation:** Yes.

INTEGRATED 2560 ATTACHMENT (#4670). Control for attaching the 2560 Multi-function Card Machine md1 A1 or A2. **Specify:** #9800f for md1 A1, or #9801f for md1 A2. **Limitation:** Cannot be installed with Integrated 2560 Attachment (#4695) or Basic Byte Multiplexer Channel (#5248) ... installation of RPOs are required to install #4670 with Basic Byte Multiplexer Channel (#5248). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** #9727 is required on the 2560 MFCM ... see “Specify” under 2560.

**2580 CARD PRINT CONTROL (#4674):** Provides control for Card print capability on the 2560 Multi-function Card Machine md1 A1. **Specify:** #9797f for first two print lines, #9798f for second two, when corresponding Card Print features. ([4775, 1577, 1578] are installed on the 2560 A1. **Field Installation:** Yes. **Prerequisite:** Integrated 2560 Attachment (#4670) on the 3115.

**MAGNETIC TAPE ADAPTER (#4675):** Provides control for attaching of one 3411 Magnetic Tape Unit and Control md1 1, 2 or 3 or one 3803 Tape Control md1 3. See 3420 and 3803 or 3411 and 3410 for additional ordering instructions. The Magnetic Tape Adapter is addressed as channel 2. **Maximum:** One. **Specify:** #9807 for attachment of 3803 md1 3. See “Highlights” for additional information. **Field Installation:** Yes. **Limitation:** A 3403 and 3411 cannot coexist on the Magnetic Tape Adapter.
SERIES COMPATIBILITY (#8070).

EBCDIC DP Machines INTEGRATED 5203 MOL Control 3411, except for 3115 3115 Processing or ed will will allow the 5425 Multi-function Byte Multiplexer attachment (#8639) is specified on the system unless RPQs are installed. INTEGRATED EXTENDED S/360 MODEL 20 COMPATIBILITY (#7520). Installation: Yes. Prerequisite: The 5425 is attached to the 3115 either a 3203 or 5203 Printer is required to provide the necessary power. If, however, a separate power supply for the 5425 is desired, IBM will provide it on an RPQ basis.

BASIC BYTE MULTIPLEXER CHANNEL (#5248). To attach low speed devices... see Byte Multiplexer Channel under "Input/Output Channel." Feature includes control storage necessary for IOP operation. Limitations: The Basic Byte Multiplexer Channel (#5248) and the Integrated Requestor feature (##4670 or #4695) cannot be installed together on the same system unless RPQs are required to install #4695 with Basic Byte Multiplexer Channel (#5248). Maximum: One. Field Installation: Yes. Prerequisite: If the 5425 is attached to the 3115 either a 3203 or 5203 Printer is required to provide the necessary power. If, however, a separate power supply for the 5425 is desired, IBM will provide it on an RPQ basis.

S/360 MODEL 20 COMPATIBILITY (#7520). Microprogram controlled feature which, in combination with special software, permits the system to execute S/360 model 20 instructions. Field Installation: Yes. Note: On the 315-2, #7520 and 1401/1440/1460 Compatibility (#4457) are mutually exclusive (may not be ordered on the same system unless RPQ is installed). Limitation: Cannot be installed with 3344 Attachment (#9317).

1052 COMPATIBILITY (#8005). Operates on the 5213 Printer mdl 1 and standard keyboard as an operator console in permis... permits the system to execute 1052 COMPATIBILITY (#8005) and the Integrated Requestor feature (##4670 or #4695) cannot be installed together on the same system unless RPQs are required to install #4695 with Basic Byte Multiplexer Channel (#5248). Maximum: One. Field Installation: Yes. Prerequisite: Basic Byte Multiplexer Channel (#5248).

EXTENDED BYTE MULTIPLEXER CHANNEL (#5240). [315-2 only] Provides the additional circuitry to enable the Basic Byte Multiplexer Channel to operate at an improved byte data rate up to 25Kbps. Maximum: One. Field Installation: Yes. Prerequisite: Basic Byte Multiplexer Channel (#5248).

Communications Features

INTEGRATED COMMUNICATIONS ADAPTER (ICA) (#4640). Provides the basic control and storage common circuits for direct attachment of up to five synchronous (BSC) communication lines or up to eight asynchronous (start/stop) communication lines depending upon line speed. Additional features are required to create appropriate interface lines for the individual lines. Figure 1B schematically represent the feature build-up. Figure 1A shows the feature build-up for asynchronous lines or for combinations of asynchronous and synchronous lines. Figure 1B shows the feature build-up when only synchronous lines are required. The ICA provides as standard:
- Autopoll
- Multipoint central station functions
- Multipoint tributary station functions
- EBCDIC transparent mode
- EBCDIC or ASCII code

Refer to Figures 2A and 2B for attachable terminals and for configuration requirements prior to ordering features below. The normal procedure requires completion of ICA Specification Form with each model 115 containing feature #4640.

Note: (or refer to ICA Configurator Manual, GA33-1513).

Customer Responsibilities -- see M 2700 pages for customer responsibilities, facilities, and services.

Communications Facilities -- see M 2700 pages for communications facility requirements with this feature.

Maximum: One. Field Installation: Yes. Prerequisite: ICA (#4640).

ASYNCHRONOUS LINE GROUP (ALG) (#1201). Permits attachment of up to four Medium Speed Asynchronous Lines (AL) (#1241) or up to four Telegraph Line Pairs (TLP) (#7881). The lines within the ALG, positions A1 thru A4, must be installed in ascending order. Specified One line control specify code from Figure 2A. Limitation: All lines in the ALG must have the same line speed and control. Different terminals can be attached, provided they use the same speed and line control. See Figure 2A.

Note: IBM ALG (#1201) and SLHS (#7121) are mutually exclusive. Maximum: One. Field Installation: Yes. Prerequisite: ICA (#4640).

ASYNCHRONOUS LINE GROUP, MEDIUM SPEED (AL) (#1231). Provides for the attachment of one non-switched 600 bps start/stop communications line. The 3767 terminal can be attached to this feature (#1231, 1232, 1235, and 1240). Permits the line to be switched or non-switched 300 bps or via non-switched lines at 600 or 1200 bps. Clocking speed is selected at installation time. Connects to the line via a modem or IBM Line Adapter. The line is installed in ascending order, A1 thru A4. Note: IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. Limitations: See Figure 5, Max. ICA Configuration. #1231, #1241 and #7881 cannot be mixed within the ALG. Maximum: Four. Field Installation: Yes. Prerequisite: ALG (#1201).

ASYNCHRONOUS LINE PAIR, LOW SPEED (ALP) (#1241). Provides for the attachment of one switched 110.0 bps or non-switched or non-switched 134.5 bps start/stop communications lines. Connects to the line via a modem or IBM Line Adapter. The lines are installed in ascending order, A1 thru A4. Note: IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. Limitations: See Figure 5, Max. ICA Configuration. #1231, #1241 and #7881 cannot be mixed within the ALG. Maximum: Four. Field Installation: Yes. Prerequisite: ALG (#1201).

AUTO CALL ADAPTER (ACA) (#1291, 1292, 1295, 1296). Provides automatic dialing capabilities on switched facilities. One of these features is required for each line equipped to automatically originate calls on switched networks. See Figure 3 for the selection of correct feature code. Limitation: The use of Auto Call in one line group precludes the last two lines/line pairs of that group ... See Figure 3. Maximum: Two per line group ... maximum total, four. Field Installation: Yes. Prerequisite: ACA (#1291).

IBM LEASED LINE ADAPTER (#4743). A modem for start/stop data transmission at 134.5 or 600 bps over non-switched facilities. This line adapter operates with Leased Line Adapters on other IBM

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3115 Processing Unit (cont'd)
products. Selection between 2-wire and 4-wire operation is made at installation time. See Leased Line Adapter in SRL GA24-3435 for specifications and restrictions. Specify: See Figures 4C and 4D. Maximum: See Figures 4C and 4D. Field Installation: Yes. Requirements: AL (#1231) or ALP (#1241) and a Line Adapter Base (#4792 or #4793) ... also see Figures 4C and 4D.

IBM 1200 BPS LINE ADAPTER (#781, #782, #781). A modem for BSC data transmission at up to 1200 bps over non-switched facilities or switched network. Also for start/stop transmission at 300, 600 or 1200 bps over non-switched facilities to the 3127 terminal. Unlocked and must interface to a SLC (#7141-7144) or AL (#1231).

The Line Adapter is available in three different versions: #781 -- non-switched #782 -- switched with autoanswer #783 -- switched with autoanswer and autoanswer Attachment to non-switched facilities is via an IBM provided cable directly to the line. Attachment to the switched network is via an IBM provided cable to a common carrier arrangement type CBS or equivalent. Customer Responsibilities ... see M 2700 pages. Communications Facilities ... see M 2700 pages. Specify: See Figures 4C and 4D. Maximum: See Figures 4C and 4D. Field Installation: Yes. Requirements: SLC (#7141-7144) or AL (#1231) and a Line Adapter Base (#4792 or #4793). Also see Figures 4C and 4D. ACA (#1295 or #1296) is required for #781.

LINE ADAPTER BASE 2 (LAB 2) (#4792). Permits attachment of up to two IBM 1200 BPS line adapters and up to four IBM Leased Line Adapters. The Line Adapters are tied to specific line positions. See Figure 4C for configuration and possible line combinations. Note: LAB 2 is required for IBM 1200 BPS Line Adapters with autoanswer (#4782) or with autocall and autoanswer (#4791). Limitations: LAB 2 (#4792) and LAB 3 (#4793) are mutually exclusive. Maximum: One. Field Installation: Yes. Requirements: On 3115-2, LAB 2 requires Expansion Base (#3860) unless RPs #70141 and #70132 are installed.

LINE ADAPTER BASE 3 (LAB 3) (#4793). Provides attachment of up to four IBM 1200 BPS Line Adapters and up to eight IBM Leased Line Adapters. The Line Adapters are tied to specific line positions. See Figure 4D for configuration and possible line combinations. Limitations: LAB 2 (#4792) and LAB 3 (#4793) are mutually exclusive. Maximum: One. Field Installation: Yes. Requirements: On 3115-2, LAB 3 requires Expansion Base (#3860) unless RPs are installed.

SYNCHRONOUS LINE GROUP (SLG) (#7100). Permits attachment of up to four medium speed BSC lines, SLC (#7141-7144) and/or SL (#7151-7154). Maximum line speed is 1200 and 7200 bps respectively. The lines in this group, positions S1 thru S4, must be installed in ascending order. The lines can have different line speeds within the maximum specified. Specify: Maximum line speed in the group: #7551f for 1200 bps maximum ... #7554f for 2400 bps max ... #7554f for 4800 bps max ... #757f for 7200 bps max. Maximum: One. Field Installation: Yes. Requirements: ICA (#4640).

SYNCHRONOUS LINE HIGH SPEED (SLHS) (#7121). Provides for the attachment of one non-switched BSC line at speeds up to 50.0 kbps. See Figure 1B. This is a digital current interface for attachment to facility E1, E2 or E3. Note: Only for non-switched point-to-point lines. Limitations: This line has a load factor of 100% and must not be operated simultaneously with any other line in the ICA ... see Figure 1B. SLHS (#7121) and ALG (#1201) are mutually exclusive. Maximum: One Field Installation: Yes. Requirements: ICA (#4640).

SYNCHRONOUS LINE MEDIUM SPEED WITH CLOCK (SLC) (#7141-7144).
#7141 -- Line position S1 #7142 -- Line position S2 #7143 -- Line position S3 #7144 -- Line position S4

Line positions S1 thru S4 must be installed in ascending order. Each feature provides for the attachment of one switched or non-switched BSC line. The clock can be set by the user for a transmission rate of 600 bps or 1200 bps. Connects to the line via an unclocked modem or IBM Line Adapter. Notes: IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. SL (#7151-7154) may be intermixed with SLC (#7141-7144) within the SLG. Limitations: See Figure 5, Max. ICA Configuration. #7141 is mutually exclusive with #7151, #7142 with #7152, #7143 with #7153, and #7144 with #7154. Maximum: #7141 thru #7144, one each. Field Installation: Yes. Requirements: SLG (#7100).

SYNCHRONOUS LINE MEDIUM SPEED (SL) (#7151-7154).
#7151 -- Line position S1 #7152 -- Line position S2 #7153 -- Line position S3 #7154 -- Line position S4

Line positions S1 thru S4 must be installed in ascending order. Each feature provides for the attachment of one switched or non-switched BSC line. Non-switched lines with switched network back-up are supported. Maximum line speed on non-switched lines is 1200 bps; on switched back-up network 3800 bps; on switched network 4800 bps. See Figure 2B for detailed speed and facility information. Connects to the line via a modem. The modem must provide clocking. Note: SL(#7151-7154) may be intermixed with SLC (#7141-7144) within the SLG. Limitations: See Figure 5, Max. ICA Configuration. #7151 is mutually exclusive with #7141, #7152 with #7142, #7153 with #7143, and #7154 with #7144. Maximum: #7151 thru #7154, one each. Field Installation: Yes. Requirements: SLG (#7100).

TELEGRAPH LINE PAIR (TLP) (#7881). Provides for the attachment of two non-switched single current telegraph lines at 45.5, 56.9, 74.2 or 75 bps. Attachment to the lines is via an IBM provided external cable. Lines A1 thru A4 are installed in ascending order. Limitations: See Figure 5, Max. ICA Configuration. #1231, #1241 and #7881 cannot be intermixed within the ALG. Maximum: Four. Field Installation: Yes. Requirements: ALG (#1201).

MODEMS One of the following modes can be attached to each of the BSC lines of the ICA (#4640). Requirements: SL (#7151-7154).

Modem Speed (bps) 3863 2400/1200 3872 2400/1200 3864 4800/2400 3874 4800/2400 3875 7200/3600/1800

Note: For communications capabilities, product utilization and special features, see J631, J634, J637, J638, J675 and M 2700 pages.

SYNx $ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies disks. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

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### FIGURE 1A
**INTEGRATED COMMUNICATIONS ADAPTER SCHEMATIC FEATURE BUILD-UP**

<table>
<thead>
<tr>
<th>Feature</th>
<th>ICAE (4641)</th>
<th>LINE GROUP</th>
<th>LINE INTERFACE</th>
<th>Async Line Position</th>
<th>Synch Line Position</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ICAE (4641)</strong></td>
<td></td>
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<tr>
<td><strong>ALG (1201)</strong> (2)</td>
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<tr>
<td><strong>SLG (17100)</strong></td>
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<td></td>
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<tr>
<td><strong>ICAE (4640)</strong></td>
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<tr>
<td><strong>SLG (17100)</strong></td>
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<td><strong>SLG (17100)</strong></td>
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</tbody>
</table>

(1) Auto Call Adapters (#1291, 1292, 1295 and 1296) restrict the use of these line positions... see Figure 3.
(2) ALG (#1201) and SLG (7121) are mutually exclusive.

### FIGURE 1B
**LINE GROUP LINE INTERFACE SYNC LINE POSITION**

<table>
<thead>
<tr>
<th>Feature</th>
<th>ICAE (4640)</th>
<th>LINE GROUP</th>
<th>LINE INTERFACE</th>
<th>Sync Line Position</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ICAE (4640)</strong></td>
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<td><strong>SLG (17100)</strong></td>
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<td><strong>SLG (17100)</strong></td>
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<td><strong>ICAE (4640)</strong></td>
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<tr>
<td><strong>SLG (17100)</strong></td>
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<tr>
<td><strong>ICAE (4640)</strong></td>
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<td><strong>SLG (17100)</strong></td>
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<td><strong>SLG (17100)</strong></td>
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<td><strong>ICAE (4640)</strong></td>
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<td><strong>SLG (17100)</strong></td>
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<td><strong>ICAE (4640)</strong></td>
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<tr>
<td><strong>SLG (17100)</strong></td>
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</tr>
</tbody>
</table>

(2) ALG (#1201) and SLHS (#7121) are mutually exclusive. Note: SLHS (#7121) cannot be operated concurrently with lines in position $1$ thru $4$.

### FIGURE 2A
**START/STOP TERMINALS**

<table>
<thead>
<tr>
<th>TERMINALS</th>
<th>SPEED (bps)</th>
<th>FACILITIES</th>
<th>LINE INTERFACE FEATURE</th>
<th>LINE CONTROL SPECIFY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1030</td>
<td>600.0</td>
<td>D2</td>
<td>C1, C2, D1</td>
<td>1231</td>
</tr>
<tr>
<td>1050</td>
<td>75.0</td>
<td>A4</td>
<td>C1, C2, D1</td>
<td>1241</td>
</tr>
<tr>
<td>1060</td>
<td>134.5</td>
<td>D1</td>
<td>C1, C2, D1</td>
<td>1241</td>
</tr>
<tr>
<td>2740 mfd 1</td>
<td>134.5</td>
<td>C1, C2, D1</td>
<td>1241</td>
<td>1241</td>
</tr>
<tr>
<td>2740 mfd 2</td>
<td>75.0</td>
<td>A4</td>
<td>7881</td>
<td>9735</td>
</tr>
<tr>
<td>2741</td>
<td>134.5</td>
<td>C1, C2, D1</td>
<td>1241</td>
<td>1241</td>
</tr>
<tr>
<td>3767 mfd 1, 2</td>
<td>300.0</td>
<td>C1, D1</td>
<td>1231</td>
<td>1231</td>
</tr>
<tr>
<td>3767 mfd 1, 2</td>
<td>300.0</td>
<td>C1, D1</td>
<td>1231</td>
<td>1231</td>
</tr>
<tr>
<td>5010 mfd Axx</td>
<td>134.5</td>
<td>C1, C2, D1</td>
<td>1231</td>
<td>1231</td>
</tr>
<tr>
<td>5100/5110</td>
<td>134.5</td>
<td>B1, B2, C1, C2, D1</td>
<td>1241</td>
<td>1241</td>
</tr>
<tr>
<td>300.0</td>
<td>C1, D1</td>
<td>1231</td>
<td>1231</td>
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<tr>
<td>AT&amp;T</td>
<td>45.5</td>
<td>A1</td>
<td>7881</td>
<td>9735</td>
</tr>
<tr>
<td>8382/8383</td>
<td>56.9</td>
<td>A2</td>
<td>7881</td>
<td>9735</td>
</tr>
<tr>
<td>WU 115A</td>
<td>74.2</td>
<td>A3</td>
<td>7881</td>
<td>9735</td>
</tr>
<tr>
<td>TXW33/335</td>
<td>110.0</td>
<td>C3</td>
<td>1241</td>
<td>1241</td>
</tr>
</tbody>
</table>

---

$^*$ CPU diskette-only specify feature. No fee when ordered at time of manufacture or when chargeable feature that supplies diskette. $290$ on purchased machines to include any number of diskette-only changes ordered on same diskette.

** Feature supplies CPU diskette.

---

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**FIGURE 2B**

**BINARY SYNCHRONOUS TERMINALS**

<table>
<thead>
<tr>
<th>SPEED Code</th>
<th>LINE INTERFACE</th>
<th>FACILITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>7141-7144</td>
<td>C3</td>
</tr>
<tr>
<td>600</td>
<td>7141-7144</td>
<td>C4</td>
</tr>
<tr>
<td>1200</td>
<td>7141-7144</td>
<td>D3</td>
</tr>
<tr>
<td>2400</td>
<td>7151-7154</td>
<td>C5</td>
</tr>
<tr>
<td>2400</td>
<td>7151-7154</td>
<td>D4, X1M†††</td>
</tr>
<tr>
<td>2400/1200</td>
<td>7151-7154</td>
<td>D4SB††</td>
</tr>
<tr>
<td>4800/2400</td>
<td>7151-7154 or 7131-7132</td>
<td>D5, X2M†††</td>
</tr>
<tr>
<td>7200/3600</td>
<td>7151-7152</td>
<td>D6</td>
</tr>
<tr>
<td>7200/3600</td>
<td>7151-7152</td>
<td>D6SB</td>
</tr>
<tr>
<td>19,200</td>
<td>7121</td>
<td>E1</td>
</tr>
<tr>
<td>40,800</td>
<td>7121</td>
<td>E2</td>
</tr>
<tr>
<td>50,000</td>
<td>7121</td>
<td>E3</td>
</tr>
</tbody>
</table>

**FIGURE 3**

**AUTO CALL ADAPTERS**

<table>
<thead>
<tr>
<th>Auto Call Adapter Feature Code</th>
<th>Provides Auto Call for Line Position</th>
<th>Prerequisites</th>
<th>Precludes Line Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>129</td>
<td>A1 (1)</td>
<td></td>
<td>A3 and A4</td>
</tr>
<tr>
<td>129</td>
<td>A2 (1)</td>
<td>1241</td>
<td>A3 and A4</td>
</tr>
<tr>
<td>129</td>
<td>S1</td>
<td>7141 and 7151</td>
<td>S3 and S4</td>
</tr>
<tr>
<td>129</td>
<td>S2</td>
<td>7142 or 7152 and 1295</td>
<td>S3 and S4</td>
</tr>
</tbody>
</table>

(1) Provides Autocall in this line position for the first line of the synchronous line pair (1241).

**FIGURE 4A**

**IBM LINE ADAPTERS**

<table>
<thead>
<tr>
<th>FACILITY</th>
<th>BSC</th>
<th>START/STOP up to 600 bps</th>
<th>START/STOP (1) up to 1200 bps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-switched pt-to-pt</td>
<td>4781</td>
<td>4743</td>
<td>4781</td>
</tr>
<tr>
<td>Non-switched multipoint control</td>
<td>4781</td>
<td>4743</td>
<td>4781</td>
</tr>
<tr>
<td>Non-switched multipoint tributary</td>
<td>4781</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Switched with answer</td>
<td>4782</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Switched with answer and autocall</td>
<td>4791</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>

(1) Only with the 3767 terminal.

**FIGURE 4C**

**LINE ADAPTER BASE 2 (4792)**

Maximum, 6 IBM Line Adapters

<table>
<thead>
<tr>
<th>LINE POSITION</th>
<th>LINE ADAPTER</th>
<th>LINE ADAPTER POSITION SPECIFY</th>
<th>PREREQ</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 1st line</td>
<td>4743</td>
<td>9465</td>
<td>1241</td>
<td></td>
</tr>
<tr>
<td>A1 2nd line</td>
<td>4743</td>
<td>9465</td>
<td>9463</td>
<td></td>
</tr>
<tr>
<td>A2 1st line</td>
<td>4743</td>
<td>9465</td>
<td>1241</td>
<td></td>
</tr>
<tr>
<td>A2 2nd line</td>
<td>4743</td>
<td>9465</td>
<td>9465</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>4781</td>
<td>9471</td>
<td>7141</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>4782</td>
<td>9471</td>
<td>7142</td>
<td></td>
</tr>
</tbody>
</table>

$\$ CPU diskette-only feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.
3115 Processing Unit (cont’d)

FIGURE 4D
LINE ADAPTER BASE 3 (#4793) ... Maximum, 12 IBM Line Adapters

<table>
<thead>
<tr>
<th>LINE POSITION</th>
<th>LINE ADAPTER</th>
<th>LINE ADAPTER POSITION SPECIFY</th>
<th>PREREQ</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 1st line</td>
<td>4743</td>
<td>9485</td>
<td>1241</td>
<td></td>
</tr>
<tr>
<td>A1 2nd line</td>
<td>4743</td>
<td>9486</td>
<td>9405</td>
<td></td>
</tr>
<tr>
<td>A2 1st line</td>
<td>4743</td>
<td>9487</td>
<td>1241</td>
<td></td>
</tr>
<tr>
<td>A2 2nd line</td>
<td>4743</td>
<td>9488</td>
<td>9407</td>
<td></td>
</tr>
<tr>
<td>A3 1st line</td>
<td>4743</td>
<td>9489</td>
<td>1241</td>
<td></td>
</tr>
<tr>
<td>A3 2nd line</td>
<td>4743</td>
<td>9490</td>
<td>9409</td>
<td></td>
</tr>
<tr>
<td>A4 1st line</td>
<td>4743</td>
<td>9491</td>
<td>1241</td>
<td></td>
</tr>
<tr>
<td>A4 2nd line</td>
<td>4743</td>
<td>9492</td>
<td>9491</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>4781</td>
<td>9493</td>
<td>7141</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>4781</td>
<td>9494</td>
<td>7142</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>4781</td>
<td>9495</td>
<td>7143</td>
<td></td>
</tr>
<tr>
<td>S4</td>
<td>4781</td>
<td>9496</td>
<td>7144</td>
<td></td>
</tr>
</tbody>
</table>

--- OR ---

| A1 (2)        | 4743 or 4781 | 9481, 9501 $ | 1231 | Excludes line adapter in position S4 (#9496) |
| A2 (2)        | 4743 or 4781 | 9482, 9502 $ | 1231 | Excludes line adapter in position S3 (#9495) |
| A3 (2)        | 4743 or 4781 | 9483, 9503 $ | 1231 | Excludes line adapter in position S2 (#9484) |
| A4 (2)        | 4743 or 4781 | 9484, 9504 $ | 1231 | Excludes line adapter in position S1 (#9493) |
| S1            | 4781         | 9493 $           | 7141 | Excludes line adapter in position A4 (#9486) |
| S2            | 4781         | 9494 $           | 7142 | Excludes line adapter in position A3 (#9483) |
| S3            | 4781         | 9495 $           | 7143 | Excludes line adapter in position A2 (#9482) |
| S4            | 4781         | 9496 $           | 7144 | Excludes line adapter in position A1 (#9481) |

(2) #4781 may be used only with the 3767 terminal.

FIGURE 5
MAXIMUM ICA CONFIGURATION
All lines/line pairs are assigned load factors. The sum of all load factors must not exceed 100%.

LOAD FACTOR IN %

<table>
<thead>
<tr>
<th>ASYNCHRONOUS LINES</th>
<th>1-2 Line Pairs (1-4 lines)</th>
<th>3-4 Line Pairs (5-8 lines)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLP at 45.5 &amp; 56.0 bps</td>
<td>20%</td>
<td>20%</td>
</tr>
<tr>
<td>TLP at 74.2 &amp; 75.0 bps</td>
<td>20</td>
<td>40</td>
</tr>
<tr>
<td>AL at 110.0 &amp; 134.5 bps</td>
<td>ALG, up to 4 lines</td>
<td></td>
</tr>
<tr>
<td>SLG w max 1200 bps</td>
<td>Autopoll Not Used</td>
<td>Autopoll Used</td>
</tr>
<tr>
<td>SLG w max 2400 bps</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>SLG w max 4800 bps</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>SLG w max 7200 bps</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>SLHS at max. 50 kbps</td>
<td>1 Line pt-to-pt</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Autopoll Not Used</td>
<td>Autopoll Used</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>75</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Line pt-to-pt</td>
<td></td>
</tr>
</tbody>
</table>

$ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.
The logic circuits for a following Input/Output (I/O) nanoseconds for 2 bytes. 3340 DASF 16 drives can be attached. If A2 and its attached provides distributed microcoded subprocessors for the independent handling of programs — Instruction Processing Unit (IPU), Input/Output Processing (IOPs), and Diagnostic/Maintenance (SVP).

Direct attachment of the 3333/3330 DASD Subsystem or the 3340 DASF Subsystem or the 3340/3344 DAS Subsystem (3125-2 only) is provided. Depending on model and features up to sixteen drives can be attached. In a 3340 Subsystem the 3340 md1 A2 and its attached 3340 drives can be shared with another S/370, except 3115-0 or 3125-0, via the String Switch capability (#1315).

The 2311/3330 - Series, the 2311 Mdl 1/3340 - Series and the 2314/3340 - Series Compatibility features are available as options. They are mutually exclusive. Emulation is under DOS and DOS/VS only. 2311 md1 1 emulation under DOS/VS requires SYSRES on 3340 or on 3330.

Capability to attach the 3803/3420 or 3411/3410 magnetic tape subsystem mds 1, 2 or 3 via the Magnetic Tape Adapter.

Capability to natively attach the following card I/Os through appropriate Integrated Card I/O Attachments: 2560 md1 A1; 3504 mdls A1, A2; 3525 mdls P1, P2, P3; and the 5425 mdls A1, A2 (96 column card).

Capability to natively attach the 5213 md1 1 console printer (65 cpns) is provided with the Integrated 5213 Printer Mdl 1 Attachment.

Capability to natively attach the 5213 md1 1 console printer (65 cpns) is provided with the Integrated 5213 Printer Mdl 1 Attachment. This console printer provides hardcopy output of operator messages presented on the Video/Display (CRT) console. The 1052 Compatibility feature is available.

Capability to natively attach up to 6 synchronous and up to 16 asynchronous lines is provided by the Integrated Communications Adapter with appropriate features.

Capability to natively attach the 3203 Printer is provided with the Integrated 3203 Printer Attachment.

The 1403/3203 Carriage Control Feature provides the capability to load information contained in the 1403 Carriage Control Tape into the 3203 Forms Control Buffer.

S/360 Model 20 Compatibility and 1401, 1440, 1460 Compatibility features are provided to allow execution of the instructions of those systems.

The Operator Console is an integral part of the 3125. The standard on-line Video/Display/Keyboard enhances operator (human factor) - machine communications. Data can be manually entered into processor main storage or into internal registers via the keyboard. Contents of storage or internal registers of the 3125 can be displayed on the Video/Display screen. The Video/Display with 16 lines of 56 characters/line and keyboard are designed for use as an operator console. A portion of the screen is reserved to display machine status. The Service Processor (SVP) monitors system operation and logs errors on the magnetic IBM Diskette device. The SVP initiates recovery on detection of error conditions and provides control for the Display, Keyboard, Magnetic Diskette and optional console printer.

The standard console file is the basic microprogram loading device for the system. The console file contains a small read/write file device that provides the microcode for the system on removable magnetic IBM Diskettes. The diskettes that are supplied with the system will contain the required microcode for the basic system. The optional features ordered for the system, and CE diagnostics.

The CE logout of machine and I/O related checks and errors are recorded on the console file diskette for CE diagnosis, to enhance the reliability, availability, and serviceability of the model 125.

Extended Control (EC) Mode expands the structure of the Program Status Word to accommodate the control of new S/370 features and extends the number of permanently assigned main storage locations. The model 125 can operate in either EC Mode or Basic Control (BC) Mode as defined for the S/360.

Dynamic Address Translation (DAT) is a standard facility on the model 125. When the model 125 is in EC Mode with Translation Mode operative, programs are not required to be completely resident in main memory for execution. Under Supervisor Control, portions of programs (Pages) may be stored on a direct access device until needed, at which time they will be returned to main storage and may be relocated to any available location. Program addresses are treated as _"logics addresses"_ and the translation feature develops "real addresses." Since logical storage addressing is not limited by the amount of available real storage, program size may exceed real storage size. This logical storage is referred to as _"virtual storage"_ and may be as large as 16,777,216 bytes on the S/370 md1 125.

Program Event Recording (PER), a standard feature, is a debugging aid which permits four types of events to be selectively monitored: (1) Successful branches ... (2) Instruction fetch address compare ... (3) Main storage alteration address compare ... (4) General Register alteration address compare.

Standard features include a S/370 commercial instruction set, Extended Control (EC) Mode, Dynamic Address Translation, Channel Indirect Data Addressing, Program Event Recording, Monitor Command, interval timer, time-of-day clock, CPU Time and Clock Comparator, store and fetch protect, byte-oriented operand feature, error checking and correction on main storage, automatic instruction retry, and audible alarm.

Control Storage: Reordable control storage for the Service Processor (SVP), direct DASD attachment, and Instruction Processing Unit (IPU) are provided as standard on the 3125 Processing Unit. In addition, reordable control storage is available for the optional Card I/O Attachment, Printer Attachment, Integrated Communications Adapter (ICA), byte Miplexer Channel, and Console Printer Attachment. Control storage is loaded from the diskette housed in the Service Console Unit.

The IPU of the 3125-0 contains as standard 12K words of control storage. Certain features/combinations require up to two 4K word increments in addition. See Chart A for details.

The IPU of the 3125-2 contains as standard 16K words of control storage. One 8K word increment may be ordered as an optional feature for use with certain feature combinations. See Chart A for details.

Chart A: Listed below are the valid feature combinations and their respective requirements for additional control storage.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1401/1440/1460</td>
<td>X</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Compatibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3/630</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>md1 10 Compatibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(410)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floating Point</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended Precision</td>
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<td></td>
<td></td>
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<tr>
<td>(3310)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2311 Mdl 1/3330</td>
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<td></td>
</tr>
<tr>
<td>Series Compatibility</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(8040)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2311 Mdl 1/3340</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Series Compatibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(8900)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2314/3320 Series</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compatibility</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(9070)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 1401/1440/1460 Compatibility (#445) and S/360 Model 20 Compatibility (#2520) are mutually exclusive (may not be ordered on the same system unless 3125 is installed on the 3125. Cannot be installed with 3344 Attachment (#3917). NOTE: RPQ compatible only if the 2311 Mdl 1/3340/3344 Compatibility (#8070) or 2314/3340-Series Compatibility (#8070) is installed.

Not to be reproduced without written permission.
Byte Multiplexer Channel (optional) — A wide variety of I/O devices may be attached to S/370 mdd 125 via the optional byte Multiplexer Channel. One channel is available on the 3125 as a special feature and is functionally equivalent to the Multiplexer channel on S/360 mdds 22, 25, 30 and 40. Thirty-two subchannels are provided as standard ... eight channels may be shared and twenty-four are unused. The Multiplexer channel provides eight control unit positions and permits I/O units to operate normally in byte mode, giving the effect of several I/O operations simultaneous with controlling. In burst mode, the channel handles one high speed unit with a maximum data rate of 29 KB per second. It is capable of sustained data rates up to 25 KB per second in byte mode. It is addressed as channel 1 for OS exclusions. For S/360 Operating Systems. Generation:"

Console Function — System control functions are provided by the standard integrated Video/Display Keyboard. It has the switches and lights necessary to operate and control the system. Optional — the 5213 mdl 1 console printer (85 cps) may be attached via special feature #9692. The optional 1052 Compatibility feature (#9005) operates the 5213 Printer mdl 1 and standard system's keyboard as an operator console in S/360-1052 mode only. In this mode of operation the Video/Display-Keyboard acts as a slave unit to the printer.

Bibliography: GC20-0001
SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
[3] Cabling: #9080 for below the floor, or #9081 for on the floor.

Minimum Configuration: See 'Minimum Configuration' in 'Systems' for minimum I/O units required in a S/370 mdd 125.

DASD Attachment: Specify one — #9313f for 3333 Attachment, or #9314f for 3340 Attachment or #9315 for 3340 Attachment (3125-2 only). Specify Fixed Head Attachment (#9190f) if Fixed Head Feature is installed on the 3340 Series drives. NOTE: The Fixed Head Attachment Feature (#9190f) cannot be installed with 2311 Mdl 1/3340-Series Compatibility (#8060) or 2314/3340-Series Compatibility (#8070).

Specify #9315f (3125-2 only) for String Switch Capability/16-Drive Expansion if String Switch (#8150) is installed on one or both 3340 mdd A2s, or if a second 3340 mdd A2 is installed no matter how many drives there are (16-Drive Expansion). Specify #9306 Second String if two 3340 mdd A2s are installed. #9315 requires 4K DASF Control Storage Extension (#4210). #9315 cannot be installed with #4105 or #4460 and is mutually exclusive with 3344 Attachment (#9317).

When String Switch is installed, an Emergency Power Off connection between the sharing systems is mandatory. RPO DC 3621 (two system connection) or DC 3622 (multiple system connection) must be ordered.

The 3125-2 uses fixed addresses 160 to 16F for its attached disk drives. In the case of string switch, to avoid conflicts, specify code #9821 on the 3125 providing addresses 160 thru 16F to comply with the fixed addresses of the 3125. If intermixing 3330 and 3340 on the 3125, 3135-3, 3135 IFA this requires specify code #9821 on the 3135 providing addresses 160 thru 16F to comply with the fixed addresses of the 3125. If intermixing 3330 and 3340 on the 3135, 3135-3, 3136 IFA, no string switching is possible.

NOTE: The string switch of the DASD hardware function can be operated with the present OS/VS standard DASD support. OS/VS does not support the device reserve/release channel commands for program controlled sharing of attached DASD units. Therefore, it is the user's responsibility by appropriate organization and programming procedures to resolve conflicting references to shared files and insure data integrity. One method for controlling potential conflicts involves the use of operator commands DVC UP/DVC DN. For additional information consult OS/VS System Management Guide, GC33-5371.

[8] On the 3125-2, specify 3344 Attachment (#9317) when 3344 mdd B2/B2Fs are installed. 4K DASF Control Storage Extension is required. Cannot be installed with any of the following: String Switch Capability (#9310), 311X/3340 Compatibility (#8060/8070) ... S/360 Mdl 20 Compatibility (#7520)

CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.
### IBM

**3125 Processing Unit (cont’d)**

... 1401/1440/1460 Compatibility (#4457) ... 1403/3203 Carriage Control Feature (#4460). Specify #9306 Second 3340 Mdl Cartridge Control Storage if two 3340 mdls are installed.

### OEM

**Cartridges**

- **3125**
  - G: $4,405
  - GE: $4,200
  - GF: $3,800

**3125 FE**

- G: $4,405
- GE: $4,200
- GF: $3,800
- H: $4,900

**3125 FE2**

- G: $4,825
- GE: $4,620
- GF: $4,225
- H: $4,920

**3125 HG2**

- G: $5,067
- GE: $5,067
- GF: $5,188
- H: $5,430

**3125 I2**

- G: $6,019
- GE: $6,019
- GF: $5,475
- H: $6,150

### PRICES: Mdl (49)

**3125**

**3125 FE**

- G: $4,405
- GE: $4,200
- GF: $3,800
- H: $4,900

**3125 FE2**

- G: $4,825
- GE: $4,625
- GF: $4,225
- H: $4,925

**3125 HG2**

- G: $5,067
- GE: $5,188
- GF: $5,430
- H: $5,430

**3125 I2**

- G: $6,019
- GE: $6,019
- GF: $5,475
- H: $6,150

### PRICES: Mdl (49)

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>FE</th>
<th>FE2</th>
<th>HG2</th>
<th>I2</th>
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<tr>
<td>G</td>
<td>$3,750</td>
<td>$4,225</td>
<td>$5,260</td>
<td>$5,750</td>
</tr>
<tr>
<td>GE</td>
<td>$3,800</td>
<td>$4,300</td>
<td>$5,300</td>
<td>$5,700</td>
</tr>
<tr>
<td>GF</td>
<td>$3,800</td>
<td>$4,300</td>
<td>$5,300</td>
<td>$5,700</td>
</tr>
<tr>
<td>H</td>
<td>$4,250</td>
<td>$4,650</td>
<td>$5,650</td>
<td>$6,150</td>
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</tbody>
</table>

### T/LP/MAC/MHC

**TLP/MAC/MHC**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>FE</th>
<th>FE2</th>
<th>HG2</th>
<th>I2</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>$4,250</td>
<td>$4,750</td>
<td>$5,790</td>
<td>$6,250</td>
</tr>
<tr>
<td>GE</td>
<td>$4,450</td>
<td>$4,950</td>
<td>$5,950</td>
<td>$6,450</td>
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<tr>
<td>GF</td>
<td>$4,450</td>
<td>$4,950</td>
<td>$5,950</td>
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</tr>
<tr>
<td>H</td>
<td>$4,900</td>
<td>$5,400</td>
<td>$6,400</td>
<td>$6,900</td>
</tr>
</tbody>
</table>

### SPECIAL FEATURES

**SPECIAL FEATURES**

-added 4,096 words (22-bits wide) to the DDA control storage for use with either or both the String Switch Capability or 16-Drive Expansion specify feature G or J. See Chart A. Limitation: Cannot be installed with feature #3917. Limitation: Cannot be installed with #4105 or #4460. Maximum: One. Field Installation: Yes.

- 1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with special software, permits the system to execute 1401/1440/1460 instructions. Limitations: Cannot be installed with 3344 Attachment (#3917) or with 5/360 Model 20 Compatibility (#8060) unless RPO No. 17 is installed on the 3125. RPO cannot be installed if the 2311 Mdl 1/3340 or 2314/3340 Compatibility feature (#8070) is installed. Also note Control Storage requirements in Chart A. Field Installation: Yes. Prerequisite: See “Control Storage Requirements” under “Highlights” above.

- 1403/3203 CARRIAGE CONTROL FEATURE (#4460). Allows the 3203 Printer with its tapeless carriage control to emulate the function of a tape controlled carriage and thus run programs written for a 1403 Printer. The 3203 Printer is not supported by this feature. Cannot be installed with String Switch Capability/16-Drive Expansion specify feature #3915 or 3344 Attachment specify feature #3917. Field Installation: Yes. Prerequisite: 3203 Printer. Note: #4460 is not required with DOS/VS Release 31 and subsequent releases.

- 5425 MULTI-FUNCTION CARD UNIT POWER PREREQUISITE (#4500). Provides the power supply for the 5425 Multi-function Card Unit when no native printer (1403 or 3203) is attached. Limitation: Cannot be installed with 1403 Printer/5425 Card Unit Power Prerequisite (#4500). Maximum: One. Field Installation: Yes.

- 1403 PRINTER/5425 CARD UNIT POWER PREREQUISITE (#4505). Provides the power supply for the 5425 Multi-function Card Unit when no native printer (1403 or 3203) is attached. Limitation: Cannot be installed with 1403 Printer/5425 Card Unit Power Prerequisite (#4505). Maximum: One. Field Installation: Yes.

**INTEGRATED 3203 PRINTER ATTACHMENT (#4650).** Control for attaching the 3203 Printer mtl 1 or 2. Specify: #9770 for 3203 mtl 1, or #9771 for 3203 mtl 2. Limitation: Cannot be installed with Integrated 1403 Printer Attachment (#4662, 4667 or 4668). Maximum: One. Field Installation: Yes.


**INTEGRATED 1403 PRINTER MDL 2 ATTACHMENT (#4667).** Control for attaching the 1403 Printer mtl 2. Prerequisite feature required for installation of the Integrated 1403 Printer Mdl 2 or Mdl N1 Attachment (#4662, #4667). Limitation: Cannot be installed with Integrated 3203 Printer Attachment (#4650). Maximum: One. Field Installation: Yes. Prerequisite: Integrated 1403 Printer Attachment (#4667) and its prerequisites (#4667, #4505).

**INTEGRATED 1403 PRINTER MDL N1 ATTACHMENT (#4668).** Control for attaching the 1403 Printer N1. Specify: #9847 for support UCS (#6640) on the 1403 mdl N1. Limitation: Cannot be installed with Integrated 3203 Printer Attachment (#4650). Maximum: One. Field Installation: Yes. Prerequisite: #9726 on the 2560 mtl A1 ... see “Specify” under 2560.


**2560 CARD PRINT CONTROL (#4674).** Provides control for Card Print capability on the 2560 MFCM mtl A1. Specify: #9797 for first two print lines, #9798 for second two print lines, #9799 for third two print lines, when corresponding Card Print (#1575, 1576, 1577) features are installed on the 2560 mtl A1. Field Installation: Yes. Prerequisite: Integrated 2560 Mtl 1 Attached (#4670).

**MAGNETIC TAPE ADAPTER (#4675).** Provides control for attachment of one 3411 Magnetic Tape Unit and Control mdl 1, 2 or 3 and one 3803 Tape Control mdl 3. Specify: #3444 for additional ordering instructions. The Magnetic Tape Adapter is addressed as channel 2. See “Highlights” for additional information. Maximum: One. Specify: #9807 for attachment of 3344 Attachment A. 3803 and F CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

---

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Series Compatibility (#8040).

EBCDIC 3125 Processing Unit (cont'd)

---

A feature on the feature is ports Read Control Integrated Field Installation: Yes.

1403 Specify: #9795; INTEGRATED Integrated Field Installation: Yes.

Prerequisite: Minimum of one 4K Storage. Prerequisites: Minimum of one 4K Storage.

S/360 MODEL 20 COMPATIBILITY (#7520). with the 5425 Multi-function Card Unit installed 1052 COMPATIBILITY (#8005).

1052 COMPATIBILITY (#8005). operates the 5213 Printer md 1 and standard keyboard as an operator console in S/360-1 system only. In this emulated mode operation the Video/Display acts as a slave unit to the printer. Field Installation: Yes.

Prerequisites: Integrated 5213 Printer Md 1 Attachment (#4692) and the 5213 Printer md 1.

2311 Md 1: 3330 - SERIES COMPATIBILITY (#8040). Permits the emulation of 2311 md 1 files on the 3333/3330 Disk Storage. The user may access both the emulated 2311 md 1 data set as well as the native data set. This provides a "mixed-mode" operating environment. Prerequisites: Minimum of one 4K Increment of Control Storage (#4101, #4102) ... see "Control Storage Requirements" under "Highlights" above. Note: When running DOS Release 21-27, 1052 Compatibility (#8005) is a prerequisite. The 1403/3203 Carriage Control Feature (#4692) is also required if a 3203 Printer is attached. Emulation under DOS/V requires SYSRES on 3340. Field Installation: Yes. Limitations: Cannot be installed with 3344 Attachment (#9317) ... #8040, #8060, #8070 and #9190 are mutually exclusive. 2314/3340 - SERIES COMPATIBILITY (#8070). Permits the emulation of 2314 files on the 3340 Disk Storage. The user program may access both the emulated 2314 data set as well as the native data set. This provides a "mixed-mode" operating environment. Prerequisites: Minimum of one 4K Increment of Control Storage also see "Control Storage Requirements" under "Highlights" above. Note: When running DOS Release 21-27, 1052 Compatibility (#8005) is a prerequisite. The 1403/3203 Carriage Control Feature (#4692) is also required if a 3203 Printer is attached. Emulation under DOS/V requires SYSRES on 3340 in native mode. Field Installation: Yes. Limitations: Cannot be installed with 3344 Attachment (#9317) ... #8040, #8060, #8070 and #9190 are mutually exclusive.

Communications Features

Integrated Communications Adapter (ICA) (#4640).

Provided the basic control storage and common circuits for direct attachment of up to six synchronous (BSC) communications lines off to sixteen asynchronous (start/stop) communications lines depending upon line speed. All combinations of BSC and start/stop require the Integrated Communications Adapter Extension (#4641). Additional features are required to create complete line interfaces for the individual lines. Figure 1A schematically represents the feature build-up. The ICA provides as standard:

- Autopoll
- Multipoint control
- Multipoint tributary station functions
- EBCDIC transparent mode
- EBCDIC or ASCII code

Refer to Figures 2A and 2B for attachable terminals and for configuration requirements prior to ordering features below.

Note: To assist in configuring the ICA -- refer to ICA Configuration Manual, GA33-1500.

Customer Responsibilities -- see M 2700 pages for customer responsibilities regarding communications facilities and services.

Communications Facilities -- see M 2700 pages for communications facility requirements with this feature.

Maximum: One. Field Installation: Yes.

INTEGRATED COMMUNICATIONS ADAPTER EXTENSION (ICAE) (#4641). This feature is required for all combinations of BSC and start/stop lines. Extends the capabilities of the ICA, allowing up to six BSC and sixteen start/stop lines depending upon line speed. Maximum: One. Field Installation: Yes. Prerequisite: ICA (#4640).

ASYNCHRONOUS LINE GROUP 1 (ALG1) (#1201). Permits attachment of up to four medium speed asynchronous lines (AL) (#1231) or up to four low speed asynchronous line pairs (ALP) (#1241) or up to four telegraph line pairs (TLP) (#7881). ALG1 and ALG2 are identical in function and either one can be installed as the first line group in the ICA. The lines within ALG1, positions A1 thru A4, must be installed in ascending order. Limitation: All lines within ALG1 must have the same line speed and line control. Different terminals using the same speed and line control can be attached within one line group. See Figure 2A. Specify one line control code specify code from Figure 2A. Maximum: One. Field Installation: Yes. Prerequisite: ICA (#4640).

ASYNCHRONOUS LINE GROUP 2 (ALG2) (#1202). Permits attachment of up to four medium speed asynchronous lines (AL) (#1232) or up to four low speed asynchronous line pairs (ALP) (#1242) or up to four telegraph line pairs (TLP) (#7882). ALG1 and ALG2 are identical in function and either one can be installed as the first line group in the ICA. The lines within ALG2, positions A5 thru A8, must be installed in ascending order. Limitation: All lines in ALG2 must have the same line speed and line control. Different terminals using the same line speed and line control can be attached within one line group. See Figure 2A. Specify one line control code specify code from Figure 2A. Maximum: One. Field Installation: Yes. Prerequisite: ICA (#4640).

ASYNCHRONOUS LINE, MEDIUM SPEED (AL) (#1231 in ALG1, #1232 in ALG2). Provides for the attachment of one non-switched 600 bps start/stop communications line. The 3767 can be attached to this feature (at EC 380427 plus EC 380627) via

S/360 MODEL 20 COMPATIBILITY (#7520). Microprogram controlled program which, in combination with special software, permits the system to execute both the emulated 2311 md 1 data set as well as the native data set. This provides a "mixed-mode" operating environment. Prerequisites: Minimum of one 4K Increment of Control Storage (#4505) required when 1403 is natively attached, or 5425 Multi-function Card Unit Power Prerequisite (#4505) if no native printer is attached, or 5425 Multi-function Card Unit Power Prerequisite (#4505) if 3203 Printer is attached, or #4500 or #4505 is required.

BYTE MULTIPLEXER CHANNEL (#5248). To attach low speed byte multiplex devices. See 'Byte Multiplexer Channel' under Input/Output Channel in 'Highlights' section. #5248 includes control switch necessary for IOP operation. Maximum: One. Field Installation: Yes.

S/360 MODEL 20 COMPATIBILITY (#7520). Microprogram controlled program which, in combination with special software, permits the system to execute both the emulated 2311 md 1 data set as well as the native data set. This provides a "mixed-mode" operating environment. Prerequisites: Minimum of one 4K Increment of Control Storage (#4505) required when 1403 is natively attached, or 5425 Multi-function Card Unit Power Prerequisite (#4505) if no native printer is attached, or 5425 Multi-function Card Unit Power Prerequisite (#4505) if 3203 Printer is attached, or #4500 or #4505 is required.

Note: Specifications only apply to feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

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switched or non-switched lines at 300 bps and via non-switched lines at 600 or 1200 bps. Clocking speed is selected at installation time. Connects to the line via a modem or IBM Line Adapter. The lines are installed in ascending order, A1 thru A4 in ALG1 and A5 thru A8 in ALG2. Note: IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. Maximum: Four each of #1213 and #1232. Field Installation: Yes. Prerequisite: ALG1 (#1201) is prerequisite to #1213, ALG2 (#1202) is prerequisite to #1232. Limitations: See Figure 5. Maximum ICA Configuration. #1213, #1214 and #7881 cannot be intermixed within ALGI. #1232, #1242 and #7882 cannot be intermixed within ALG2.

ASYNCHRONOUS LINE PAIR, LOW SPEED (ALP) (#1241 in ALG1, #1242 in ALG2). Provides for the attachment of two switched or non-switched lines at 110.0 bps or two switched or non-switched 134.5 bps start/stop communications lines. Connects to the line via a modem or IBM Line Adapter. The lines are installed in ascending order, A1 thru A4 in ALG1 and A5 thru A8 in ALG2. Note: IBM Line Adapters are tied to specific line positions ... see Figures 4C and 4D. Limitations: See Figure 5. Maximum ICA Configuration. #1213, #1241 and #7881 cannot be intermixed within ALGI. #1232, #1242 and #7882 cannot be intermixed within ALG2.

AUTO CALL ADAPTER (ACA) (#1291-1296). Provides automatic dialing capabilities on switched facilities. One of these features is required for each line equipped to automatically originate calls on switched networks. See Figure 3 for the selection of correct feature code. Limitations: The use of Auto Call in a line group precludes the last two line/pair lines of that group ... see Figure 3. Maximum: Two per line group ... maximum total six. Field Installation: Yes. Prerequisite: See Figure 3.

IBM LEASED LINE ADAPTER (#4743). A modem for start/stop data transmission at 134.5 or 600 bps over non-switched facilities. This line adapter operates with Leased Line Adapters on other IBM products. Selection between 2-wire and 4-wire operation is made at installation. See Leased Line Adapter in SRL GA24-3435 for specifications and restrictions. Specify: See Figures 4C and 4D. Maximum: See Figures 4C and 4D. Field Installation: Yes. Prerequisites: Line Adapter Base, #4742 or #4743. Also see Figures 4C and 4D.

IBM 1200 BPS LINE ADAPTER (#4781, 4782, 4791). A modem for BSC data transmission at up to 1200 bps over non-switched facilities or switched network. Also for start/stop transmission at 300, 600 or 1200 bps over non-switched facilities to the 3767 terminal. Unclocked and must interface to a SLC (#7141-7144) or AL (#1231).

The IBM 1200 bps Line Adapter is available in three different versions:

#4781 -- Non-switched
#4782 -- Switched with Autoanswer
#4791 -- Switched with Autoanswer or Autoanswer

Attachment to non-switched facilities is via an IBM provided cable directly to the line. Attachment to the switched network is via the IBM provided cable to a common carrier arrangement type CBS or equivalent. Customer Responsibilities -- see M 2700 pages. Compatibility ... see M 2700 pages. Specify: See Figures 4C and 4D. Maximum: See Figures 4C and 4D. Field Installation: Yes. Prerequisites: SLC (#7141-7144) or AL (#1231) and Line Adapter Base #4782 or #4793. Also see Figures 4C and 4D. ACA (#1295 or #1296) is prerequisite for #4791.

LINE ADAPTER BASE 2 (LAB 2) (#4792). Permits attachment of up to two IBM 1200 bps Line Adapters for BSC lines and up to four IBM Leased Line Adapters. The line adapters are tied to specific line positions. See Figure 4C for configuration and possible line combinations. Specify: LAB 2 is required for IBM 1200 bps Line Adapters with Autoanswer (#4782) or with Autoanswer and Autoanswer (#4791). Limitation: #4792 and #4793 are mutually exclusive. Maximum: One. Field Installation: Yes.

LINE ADAPTER SE (LAB 3) (#4793). Permits attachment of up to twelve IBM 1200 bps Line Adapters and IBM Leased Line Adapters. The line adapters are tied to specific line positions. See Figure 4D for configuration and possible line combinations. Limitation: #4792 and #4793 are mutually exclusive. Maximum: One. Field Installation: Yes.

SYNCHRONOUS LINE GROUP (SLG) (#7100). Permits attachment of up to four medium speed BSC lines -- SLG (#7141-7144) and SL (#7151-7154). Maximum line speed is 7200 bps. The lines in this group, positions S1 thru S4, must be installed in ascending order. The lines can have different line speeds within the maximum specified. Specify: Maximum line speed in the group:

<table>
<thead>
<tr>
<th>Max. Line Speed</th>
<th>Specify Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200 bps</td>
<td>#7951$</td>
</tr>
<tr>
<td>2400 bps</td>
<td>#7952$</td>
</tr>
<tr>
<td>4800 bps</td>
<td>#7954$</td>
</tr>
<tr>
<td>7200 bps</td>
<td>#7957$</td>
</tr>
</tbody>
</table>

Maximum: One. Field Installation: Yes. Prerequisite: ICA (#4640).

SYNCHRONOUS LINE, HIGH SPEED (SLHS) (#7121). Provides for the attachment of one non-switched BSC line at speeds up to 50.0 kbps. See Figure 1. This is a digital current interface for attachment to an E1, E2 or E3 interface. Maximum: For non-switched point-to-point lines. Limitations: See Figure 5. Maximum ICA Configuration. #7121 and #7131 are mutually exclusive. This line has a load factor of 100% and must not be operated concurrently with any other line in the ICA. Maximum: One. Field Installation: Yes. Prerequisite: ICA (#4640).

SYNCHRONOUS LINE, LOW LOAD (SLLL) (#7131 - First Line, #7132 - Second Line). Each provides for the attachment of one switched or non-switched BSC line. Non-switched lines with switched network backup are supported. Maximum line speed on non-switched lines is 7200 bps. Maximum line speed on switched backup network is 3600 bps. Maximum line speed on switched network is 2400 bps. See Figure 2B for detailed speed and facility information. Requires external modem. This feature has a lower load factor than #7151-7154 ... see Figure 5. The modem must provide clocking.

Specify: The highest line speed used on #7131 and #7132: #9758 if the highest line speed is from 1200 bps up to 4800 bps. #9759 if the highest line speed is above 4800 bps and up to 7200 bps.

Note: 1200 bps is the LOWEST allowed line speed for these features. SLG (#7100) not required as a prerequisite.

Limitations: See Figure 5. Maximum ICA Configuration ... #7131 and #7132 are mutually exclusive. Maximum: One each, #7131 and #7132. Field Installation: Yes. Prerequisites: ICA (#4640) ... #7132 requires #7131 or #7121.

SYNCHRONOUS LINE, MEDIUM SPEED WITH CLOCK (SLC) (#7141-7144).

#7141 -- Line position S1
#7142 -- Line position S2
#7143 -- Line position S3
#7144 -- Line position S4

Line positions S1 thru S4 must be installed in ascending order.

Each feature provides for the attachment of one switched or non-switched BSC line. Each feature provides for the attachment of one switched or non-switched BSC line. Non-switched lines with switched network backup are supported. Maximum line speed on non-switched lines is 7200 bps. Maximum line speed on switched backup network is 3600 bps. Maximum line speed on switched network is 2400 bps. See Figure 2B for detailed speed and facility information. Requires external modem. This feature has a lower load factor than #7151-7154 ... see Figure 5. The modem must provide clocking.

Specify: The highest line speed used on #7141 and #7142:

#9758 if the highest line speed is from 1200 bps up to 4800 bps. #9759 if the highest line speed is above 4800 bps and up to 7200 bps.

Note: 1200 bps is the LOWEST allowed line speed for these features. SLG (#7100) not required as a prerequisite.

Limitations: See Figure 5. Maximum ICA Configuration ... #7141 and #7142 are mutually exclusive. Maximum: One each, #7141 and #7142. Field Installation: Yes. Prerequisite: SLG (#7100).

SYNCHRONOUS LINE, MEDIUM SPEED (SL) (#7151-7154).

#7151 -- Line position S1
#7152 -- Line position S2
#7153 -- Line position S3
#7154 -- Line position S4

Line positions S1 thru S4 must be installed in ascending order.

Each feature provides for the attachment of one switched or non-switched BSC line. Each feature provides for the attachment of one switched or non-switched BSC line. Non-switched lines with switched network backup are supported. Maximum line speed on non-switched lines is 7200 bps. Maximum line speed on switched backup network is 3600 bps. Maximum line speed on switched network is 2400 bps. See Figure 2B for detailed speed and facility information. Requires external modem. This feature has a lower load factor than #7151-7154 ... see Figure 5. The modem must provide clocking.

Specify: The highest line speed used on #7151 and #7154:

#9758 if the highest line speed is from 1200 bps up to 4800 bps. #9759 if the highest line speed is above 4800 bps and up to 7200 bps.

Note: 1200 bps is the LOWEST allowed line speed for these features. SLG (#7100) not required as a prerequisite.

Limitations: See Figure 5. Maximum ICA Configuration ... #7151 and #7154 are mutually exclusive. Maximum: One each, #7151 thru #7154. Field Installation: Yes. Prerequisite: SLG (#7100).

TELEGRAPH LINE PAIR (TLP) (#7881 in ALG1, #7882 in ALG2).

CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.
3125 Processing Unit (cont'd)

Provides for the attachment of two non-switched single current telegraph lines at 45.5, 56.9, 74.2 or 75 bps. Attachment to the lines is via an IBM provided external cable. The lines, A1 thru A4 in ALG1 and A5 thru A8 in ALG2, are installed in ascending order.

Limitations: See Figure 5, Maximum ICA Configuration. #1231, #1241 and #7861 cannot be intermixed within ALG1. #1232, #1242 and #7862 cannot be intermixed within ALG2. Maximum: Four each, #7881 and #7882. Field Installation: Yes. Prerequisite: ALG1 (#1201) is prerequisite to #7881; ALG2 (#1202) is prerequisite to #7882.

MODEMS One IBM modem can be attached to each of the BSC lines of the ICA (#4640). Prerequisite: SL (#7151-7154) or SLLL (#7131, #7132).

<table>
<thead>
<tr>
<th>Modem</th>
<th>Speed (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3863</td>
<td>2400/1200</td>
</tr>
<tr>
<td>3872</td>
<td>2400/1200</td>
</tr>
<tr>
<td>3864</td>
<td>4800/2400</td>
</tr>
<tr>
<td>3874</td>
<td>4800/2400</td>
</tr>
<tr>
<td>3875</td>
<td>7200/3600/1800</td>
</tr>
</tbody>
</table>

Note: For communications capabilities, product utilization and special features, see 3963, 3964, 3872, 3874, 3875 and M 2700 pages.

External Signals #3998* $112 $102$ 4,200 $ 1.00

TLP MAC / MLC

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### FIGURE 3

#### 3125 Processing Unit

**FEATURE**

= INTEGRATED COMMUNICATIONS

---

**FIGURE 2B**

**BINARY SYNCHRONOUS TERMINALS**

<table>
<thead>
<tr>
<th>TERMINAL</th>
<th>SPEED (bps)</th>
<th>FACILITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1030</td>
<td>600.0</td>
<td>D2</td>
</tr>
<tr>
<td>1050</td>
<td>75.0</td>
<td>A4</td>
</tr>
<tr>
<td>1060</td>
<td>134.5</td>
<td>C1, C2, D1</td>
</tr>
<tr>
<td>2740 mdl 1</td>
<td>134.5</td>
<td>C1, C2, D1</td>
</tr>
<tr>
<td>2740 mdl 2</td>
<td>75.0</td>
<td>A4</td>
</tr>
<tr>
<td>2741</td>
<td>134.5</td>
<td>D1</td>
</tr>
<tr>
<td>3767 mdl 1, 2</td>
<td>300.0</td>
<td>C1, D1</td>
</tr>
<tr>
<td>5010 mdl Ax</td>
<td>134.5</td>
<td>C1, C2, D1</td>
</tr>
<tr>
<td>1000/5110</td>
<td>134.5</td>
<td>A1</td>
</tr>
<tr>
<td>AT&amp;T 83B2/83B3</td>
<td>110.0</td>
<td>A4</td>
</tr>
</tbody>
</table>

---

**FIGURE 2A**

**START/STOP TERMINALS**

<table>
<thead>
<tr>
<th>TERMINAL</th>
<th>SPEED (bps)</th>
<th>FACILITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1030</td>
<td>600.0</td>
<td>D2</td>
</tr>
<tr>
<td>1050</td>
<td>75.0</td>
<td>A4</td>
</tr>
<tr>
<td>1060</td>
<td>134.5</td>
<td>C1, C2, D1</td>
</tr>
<tr>
<td>2740 mdl 1</td>
<td>134.5</td>
<td>C1, C2, D1</td>
</tr>
<tr>
<td>2740 mdl 2</td>
<td>75.0</td>
<td>A4</td>
</tr>
<tr>
<td>2741</td>
<td>134.5</td>
<td>D1</td>
</tr>
<tr>
<td>3767 mdl 1, 2</td>
<td>300.0</td>
<td>C1, D1</td>
</tr>
<tr>
<td>5010 mdl Ax</td>
<td>134.5</td>
<td>C1, C2, D1</td>
</tr>
<tr>
<td>1000/5110</td>
<td>134.5</td>
<td>A1</td>
</tr>
<tr>
<td>AT&amp;T 83B2/83B3</td>
<td>110.0</td>
<td>A4</td>
</tr>
</tbody>
</table>

---

**TABLE CONTENTS**

- **ICAE**
- **LINE GROUP**
- **LINE INTERFACES**
- **Async Line Position**
- **Sync Line Position**

<table>
<thead>
<tr>
<th>ICAS (ICAE)</th>
<th>LINE GROUP</th>
<th>LINE INTERFACES</th>
<th>Async Line Position</th>
<th>Sync Line Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICA (ICAE)</td>
<td>ALG1 (#1201)</td>
<td>(1) Auto Call Adapters (#1291-1296) restrict the use of these line positions... see Figure 3.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ALG2 (#1202)</td>
<td>(1) Auto Call Adapters (#1291-1296) restrict the use of these line positions... see Figure 3.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**NOTES**

- CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

---

**SIMPLE 1200 BPS MODEM**

- 3125 ICA must use the IBM 1200 bps Modem (#4781 or #4782).
- XIM may not be used for communications with a 2703 or a S/360 mdl 25.
- X2M may not be used for communications with a 2703 or a S/360 mdl 25.

---

**TABLE**

<table>
<thead>
<tr>
<th>SPEED (bps)</th>
<th>LINE INTERFACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>7141-7144 C3</td>
</tr>
<tr>
<td>1200</td>
<td>7141-7144 C4</td>
</tr>
<tr>
<td>1200</td>
<td>7141-7144 C5</td>
</tr>
<tr>
<td>2400</td>
<td>7151-7154 C5</td>
</tr>
<tr>
<td>2400</td>
<td>7151-7154 C6</td>
</tr>
<tr>
<td>4800</td>
<td>7151-7154 C6</td>
</tr>
<tr>
<td>2400</td>
<td>7151-7154 C6</td>
</tr>
<tr>
<td>7200</td>
<td>7151-7154 C6</td>
</tr>
<tr>
<td>3600</td>
<td>7151-7154 C6</td>
</tr>
<tr>
<td>19,200</td>
<td>7121 E1</td>
</tr>
<tr>
<td>40,800</td>
<td>7121 E2</td>
</tr>
<tr>
<td>50,000</td>
<td>7121 E3</td>
</tr>
</tbody>
</table>

---

**NOT TO BE REPRODUCED WITHOUT WRITTEN PERMISSION**
FIGURE 3

AUTO CALL ADAPTERS

<table>
<thead>
<tr>
<th>AUTO CALL ADAPTER CODE</th>
<th>PROVIDES AUTO CALL FOR LINE POSITION</th>
<th>PREREQUISITES</th>
<th>PRECLUDES LINE POSITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1291</td>
<td>A1 (1)</td>
<td></td>
<td>A3 and A4</td>
</tr>
<tr>
<td>1292</td>
<td>A2 (1)</td>
<td></td>
<td>A3 and A4</td>
</tr>
<tr>
<td>1293</td>
<td>A5 (1)</td>
<td></td>
<td>A7 and A8</td>
</tr>
<tr>
<td>1294</td>
<td>A6 (1)</td>
<td></td>
<td>A7 and A8</td>
</tr>
<tr>
<td>1295</td>
<td>S1</td>
<td>7141 or 7151</td>
<td>S3 and S4</td>
</tr>
<tr>
<td>1296</td>
<td>S2</td>
<td>7142 or 7152</td>
<td>S3 and S4</td>
</tr>
</tbody>
</table>

(1) Provides Autocall in this line position for the first line of the Asynchronous Line Pair (#1241 or #1242).

FIGURE 4A

IBM LINE ADAPTERS

<table>
<thead>
<tr>
<th>FACILITY</th>
<th>IBM 1200 bps Line Adapter</th>
<th>IBM Leased Line Adapter</th>
<th>IBM 1200 bps Line Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-switched pt-to-pt</td>
<td>4781</td>
<td>4743</td>
<td>4781</td>
</tr>
<tr>
<td>Non-switched multipoint control</td>
<td>4781</td>
<td>4781</td>
<td>4781</td>
</tr>
<tr>
<td>Non-switched multipoint tributary</td>
<td>4781</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Switched with autoneg</td>
<td>4782</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Switched with autocall and autoneg</td>
<td>4791</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

(2) Only with 3767 terminal.

FIGURE 4C

LINE ADAPTER BASE 2 (#4792) ... Maximum, 6 IBM Line Adapters.

<table>
<thead>
<tr>
<th>LINE POSITION</th>
<th>LINE ADAPTER</th>
<th>LINE ADAPTER POSITION SPECIFY</th>
<th>PREREQ</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A5 1st line</td>
<td>4743</td>
<td>9463£</td>
<td>1242</td>
<td></td>
</tr>
<tr>
<td>A5 2nd line</td>
<td>4743</td>
<td>9464£</td>
<td>9463</td>
<td></td>
</tr>
<tr>
<td>A6 1st line</td>
<td>4743</td>
<td>9464£</td>
<td>1242</td>
<td></td>
</tr>
<tr>
<td>A6 2nd line</td>
<td>4743</td>
<td>9465£</td>
<td>9465</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>4781</td>
<td>9471£</td>
<td>7141</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4782</td>
<td>9473£</td>
<td>7141</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4791</td>
<td>9475£</td>
<td>7141</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>4781</td>
<td>9473£</td>
<td>7142</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4782</td>
<td>9475£</td>
<td>7142</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4791</td>
<td>9475£</td>
<td>7142</td>
<td></td>
</tr>
</tbody>
</table>

(3) #4781 may be used only with the 3767 terminal.

FIGURE 4D

LINE ADAPTER BASE 3 (#4793) ... Maximum, 12 IBM Line Adapters.

<table>
<thead>
<tr>
<th>LINE POSITION</th>
<th>LINE ADAPTER</th>
<th>LINE ADAPTER POSITION SPECIFY</th>
<th>PREREQ</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 3</td>
<td>4743 or 4781</td>
<td>9481, 9501</td>
<td>1231</td>
<td></td>
</tr>
<tr>
<td>A2 3</td>
<td>4743 or 4781</td>
<td>9482, 9502</td>
<td>1231</td>
<td></td>
</tr>
<tr>
<td>A3 3</td>
<td>4743 or 4781</td>
<td>9483, 9503</td>
<td>1231</td>
<td></td>
</tr>
<tr>
<td>A4 3</td>
<td>4743 or 4781</td>
<td>9484, 9504</td>
<td>1231</td>
<td></td>
</tr>
<tr>
<td>A5 1st line</td>
<td>4743</td>
<td>9485£</td>
<td>1242</td>
<td></td>
</tr>
<tr>
<td>A5 2nd line</td>
<td>4743</td>
<td>9486£</td>
<td>9485</td>
<td></td>
</tr>
<tr>
<td>A6 1st line</td>
<td>4743</td>
<td>9487£</td>
<td>1242</td>
<td></td>
</tr>
<tr>
<td>A6 2nd line</td>
<td>4743</td>
<td>9487£</td>
<td>9487</td>
<td></td>
</tr>
<tr>
<td>A7 1st line</td>
<td>4743</td>
<td>9490£</td>
<td>1242</td>
<td></td>
</tr>
<tr>
<td>A7 2nd line</td>
<td>4743</td>
<td>9490£</td>
<td>9489</td>
<td></td>
</tr>
<tr>
<td>A8 1st line</td>
<td>4743</td>
<td>9491£</td>
<td>1242</td>
<td></td>
</tr>
<tr>
<td>A8 2nd line</td>
<td>4743</td>
<td>9491£</td>
<td>9491</td>
<td></td>
</tr>
<tr>
<td>S1</td>
<td>4781</td>
<td>9493£</td>
<td>7141</td>
<td></td>
</tr>
<tr>
<td>S2</td>
<td>4781</td>
<td>9494£</td>
<td>7142</td>
<td></td>
</tr>
<tr>
<td>S3</td>
<td>4781</td>
<td>9495£</td>
<td>7143</td>
<td></td>
</tr>
<tr>
<td>S4</td>
<td>4781</td>
<td>9496£</td>
<td>7144</td>
<td></td>
</tr>
</tbody>
</table>

FIGURE 5

MAXIMUM ICA CONFIGURATION

All lines/line pairs are assigned load factors. The sum of all load factors must not exceed 100% if SLHS is not installed. The sum of all load factors must not exceed 200% if SLHS is installed.

<table>
<thead>
<tr>
<th>LOAD FACTOR IN %</th>
<th>1-2 line pairs</th>
<th>3-4 line pairs</th>
<th>5-6 line pairs</th>
<th>7-8 line pairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASYNCHRONOUS LINES</td>
<td>20%</td>
<td>20%</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>TLP at 45.5 and 56.9 bps</td>
<td>20-40</td>
<td>40-60</td>
<td>60-80</td>
<td>80-100</td>
</tr>
<tr>
<td>TLP at 74.2 and 75.0 bps</td>
<td>20-40</td>
<td>40-60</td>
<td>60-80</td>
<td>80-100</td>
</tr>
<tr>
<td>ALP at 110.0 and 134.5 bps</td>
<td>20-40</td>
<td>40-60</td>
<td>60-80</td>
<td>80-100</td>
</tr>
<tr>
<td>First Line Group</td>
<td>20</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Line Group</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AUTOPOll Not Used</td>
<td>Autopoll Used</td>
<td>Autopoll Not Used</td>
<td>Autopoll Used</td>
<td></td>
</tr>
<tr>
<td>AL at 300/600/1200 bps</td>
<td>20</td>
<td>40</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYNCHRONOUS LINES</td>
<td>20</td>
<td>25</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>SL and SLC at max. 1200 bps</td>
<td>20-25</td>
<td>40-50</td>
<td>80-100</td>
<td></td>
</tr>
<tr>
<td>SL at max. 4800 bps</td>
<td>20</td>
<td>25</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>SL at max. 7200 bps</td>
<td>20</td>
<td>25</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>SL at max. 50 kbps</td>
<td>20</td>
<td>25</td>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

* See "Limitations" in the Special Feature description of the feature.

$ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

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TABLE OF CONTROL STORAGE REQUIREMENTS (cont'd) BYTES

<table>
<thead>
<tr>
<th>Feature Description</th>
<th>Bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Systems Microcode</td>
<td>20,142</td>
</tr>
<tr>
<td>APL Assist (#1005)</td>
<td>13,890</td>
</tr>
<tr>
<td>Conditional Swapping (#1051)</td>
<td>300</td>
</tr>
<tr>
<td>ACOUICD (#1296)</td>
<td>440</td>
</tr>
<tr>
<td>Block Multiplexer Channel (#1421)</td>
<td>1,616</td>
</tr>
<tr>
<td>Block Multiplexer Subchannel (#1431)</td>
<td>14</td>
</tr>
<tr>
<td>Clock Comparator and CPU Timer (#2001)</td>
<td>1,400</td>
</tr>
<tr>
<td>Direct Control (#9324)</td>
<td>50</td>
</tr>
<tr>
<td>Extended Precision Floating Point (#3040)</td>
<td>676</td>
</tr>
<tr>
<td>Floating Point (#3090)</td>
<td>1,200</td>
</tr>
<tr>
<td>64 Multiplexer Subchannels (#3905)</td>
<td>1,024</td>
</tr>
<tr>
<td>128 Multiplexer Subchannels (#3906)</td>
<td>2,048</td>
</tr>
<tr>
<td>256 Multiplexer Subchannels (#3907)</td>
<td>4,096</td>
</tr>
<tr>
<td>1401/1402/1406 Compatibility (#4457)</td>
<td>3,492</td>
</tr>
<tr>
<td>Integrated Communications Adapter (#4640)</td>
<td>2,100</td>
</tr>
<tr>
<td>IFA Conversion Feature (#4645)</td>
<td>2,048</td>
</tr>
<tr>
<td>2319 Integrated File Adapter (#4650)</td>
<td>6,452</td>
</tr>
<tr>
<td>3330/3340 Series IFA (#4655) with:</td>
<td></td>
</tr>
<tr>
<td>#913</td>
<td>10,592</td>
</tr>
<tr>
<td>#914</td>
<td>9,768</td>
</tr>
<tr>
<td>#915</td>
<td>12,800</td>
</tr>
<tr>
<td>#916 ***</td>
<td>300</td>
</tr>
<tr>
<td>#917 +</td>
<td>2,200</td>
</tr>
<tr>
<td>#931</td>
<td>300</td>
</tr>
<tr>
<td>#934</td>
<td>370</td>
</tr>
<tr>
<td>#935</td>
<td>334</td>
</tr>
<tr>
<td>#936 ***</td>
<td>0</td>
</tr>
<tr>
<td>Fixed Head Attachment (#9190) with:</td>
<td></td>
</tr>
<tr>
<td>#914</td>
<td>300</td>
</tr>
<tr>
<td>#915</td>
<td>300</td>
</tr>
</tbody>
</table>

For the basic system and applicable special features, total the control storage requirements given in the table. If the total exceeds 24,576 bytes, First 12K Control Storage Insertion (#7861) is required. If the total exceeds 38,864 bytes, Second 12K Control Storage Insertion (#7862) is also required.

Limitations: The maximum configuration that can operate at any one time is determined by the available control storage (maximum 49,152 bytes). Alternate feature configurations can be operated by utilizing additional magnetic disk cartridges with another set of 3135 features. Alternate cartridges for an installation will be available by RFQ.

Virtual Storage: Extended Control (EC) Mode expands the structure of the Program Status Word to accommodate the control of many processors. S/370 features and extends the number of permanently assigned main storage locations. The S/370 mdl 135 can operate in either EC Mode or Basic Control (BC) Mode as defined for the S/370. Dynamic Address Translation (DAT) is an attachment feature on the S/370 mdl 135. When the S/370 mdl 135 is in Extended Control (EC) Mode with Translation Mode operable, program addresses treated as "logical addresses" and the attachment feature develops "real addresses." Since logical storage addressing is not limited by the amount of available real storage, program size may exceed real storage size. This logical storage is referred to as "virtual storage" and may be as large as 16,777,216 bytes on the S/370 mdl 135. For I/O operations, Channel Indirect Data Addressing provides a means to transmit data that spans pages in noncontiguous real storage.

Program Event Recording, a standard feature, is a debugging aid which permits four types of events to be selectively monitored in a virtual environment: [1] Successful branches, [2] Instruction fetch address compare ... [3] Main Storage alteration address compare ... [4] General Purpose Register alteration address compare.

Input/Output Attachments -- a wide variety of I/O devices may be attached to the S/370 mdl 135 via the standard byte multiplexer and optional selector channels. There are additionally, five direct attachment features for the 3135. They are:

Console Printer-Keyboard (Required) -- this unit serves as the on-line I/O device for operator/system communications. It provides a means of manually entering data into the system, altering or displaying data already in storage, and for printing error log messages.

2319 Integrated File Adapter (#4650) (Optional) -- this feature enables native attachment of a 2319 Disk Storage mdl A1** (and a 2319 mdl A3**, 2312** or 2318** Disk Storage). The native attachment of one or two 3330 Disk Storage and Control modules. Capability to natively attach one or two 3330 Direct Access Storage Facility mdl A2s. Capability to natively attach a 1403 Printer over 2, 7 or 11. See "Special Features.”

Virtual Storage capability to increase the effective utilization of main storage.

Up to eight teleprocessing lines are attachable via the Integrated Communications Adapter (#4640).

Standard features include a commercial instruction set, new S/370 instructions, Extended Control (EC) Mode, Dynamic Address Translation, Channel Indirect Data Addressing, Program Event Recording, interval timer, time-of-day clock, store and fetch protect, console file, byte-oriented operand feature, error checking and correction on main and control storage, automatic instruction retry, channel command retry, byte multiplexer channel, OS/DOS Compatibility Feature, and audible alarm.

A standard console file is the basic microprogram loading device for the system. The console file contains a small, low performance read only file device that provides all the microcode for the system on removable magnetic disk cartridges. The disks that will be supplied with the system will contain all of the required microcode for the basic system, the optional features ordered for the system, and FE diagnostics.

An optional Clock Comparator and Timer provides additional timing facilities for the programmer.

Control Storage Requirements -- Reusable Control Storage is housed in the 3135, and is loaded from the console file. 24,576 bytes of control storage are standard ... two additional increments of 12,288 bytes are available if required to support special features.

For the basic system and applicable special features, total the control storage requirements given in the table. If the total exceeds 24,576 bytes, First 12K Control Storage Insertion (#7861) is required. If the total exceeds 38,864 bytes, Second 12K Control Storage Insertion (#7862) is also required.

Virtual Storage: Extended Control (EC) Mode expands the structure of the Program Status Word to accommodate the control of many processors. S/370 features and extends the number of permanently assigned main storage locations. The S/370 mdl 135 can operate in either EC Mode or Basic Control (BC) Mode as defined for the S/370. Dynamic Address Translation (DAT) is an attachment feature on the S/370 mdl 135. When the S/370 mdl 135 is in Extended Control (EC) Mode with Translation Mode operable, program addresses treated as "logical addresses" and the attachment feature develops "real addresses." Since logical storage addressing is not limited by the amount of available real storage, program size may exceed real storage size. This logical storage is referred to as "virtual storage" and may be as large as 16,777,216 bytes on the S/370 mdl 135. For I/O operations, Channel Indirect Data Addressing provides a means to transmit data that spans pages in noncontiguous real storage.

Program Event Recording, a standard feature, is a debugging aid which permits four types of events to be selectively monitored in a virtual environment: [1] Successful branches, [2] Instruction fetch address compare ... [3] Main Storage alteration address compare ... [4] General Purpose Register alteration address compare.

Input/Output Attachments -- a wide variety of I/O devices may be attached to the S/370 mdl 135 via the standard byte multiplexer and optional selector channels. There are additionally, five direct attachment features for the 3135. They are:

Console Printer-Keyboard (Required) -- this unit serves as the on-line I/O device for operator/system communications. It provides a means of manually entering data into the system, altering or displaying data already in storage, and for printing error log messages.

2319 Integrated File Adapter (#4650) (Optional) -- this feature enables native attachment of a 2319 Disk Storage mdl A1** (and a 2319 mdl A3**, 2312** or 2318** Disk Storage). The native attachment of one or two 3330 Disk Storage and Control modules. Capability to natively attach one or two 3330 Direct Access Storage Facility mdl A2s. Capability to natively attach a 1403 Printer over 2, 7 or 11. See "Special Features.”

Virtual Storage capability to increase the effective utilization of main storage.

Up to eight teleprocessing lines are attachable via the Integrated Communications Adapter (#4640).

Standard features include a commercial instruction set, new S/370 instructions, Extended Control (EC) Mode, Dynamic Address Translation, Channel Indirect Data Addressing, Program Event Recording, interval timer, time-of-day clock, store and fetch protect, console file, byte-oriented operand feature, error checking and correction on main and control storage, automatic instruction retry, channel command retry, byte multiplexer channel, OS/DOS Compatibility Feature, and audible alarm.

A standard console file is the basic microprogram loading device for the system. The console file contains a small, low performance read only file device that provides all the microcode for the system on removable magnetic disk cartridges. The disks that will be supplied with the system will contain all of the required microcode for the basic system, the optional features ordered for the system, and FE diagnostics.

An optional Clock Comparator and Timer provides additional timing facilities for the programmer.

Control Storage Requirements -- Reusable Control Storage is housed in the 3135, and is loaded from the console file. 24,576 bytes of control storage are standard ... two additional increments of 12,288 bytes are available if required to support special features.
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3135 Processing Unit (cont’d)

a) Addresses X00 through X7F are assigned as block shared subchannels. With option [3], these addresses may not be used. With option [2], each block shared address position, i.e., X00, X10, X20, etc., through X70 is available. With option [3], "even" block shared address positions only are available, i.e., 00, 20, 40, and 60.

b) Selector and non-shared addresses are limited to addresses X80 through XFF.

Channel Priority (#1501). When the IFA (#4650 or #4655) and both selector channels are present, this feature changes the higher priority for performing from the first selector channel (Channel 2) to the second selector channel (Channel 3). #1501 is required if any DASD devices are to be attached to Channel 3. Field Installation: Yes. Prerequisites: Integrated File Adapter (#4650 or #4655) and both Selector Channels (#6981 and #6982).

Clock Comparator and CPU Timer (#2001). The Clock Comparator provides a means of measuring elapsed CPU time by causing an interruption when a prespecified amount of time has elapsed. Maximum: One.

Direct Control Feature (#3274). Provides two instructions, Read Direct and Write Direct, and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. Maximum: One.

Emergency Power-Off Control (#3261, #3262). To provide a single emergency power-off switch in a "room" or "area." See Emergency Power-Off Control under S/370 mdl 135 in "Systems." #3261 — to interconnect two emergency power-off switches ... #3262 — to interconnect up to twelve emergency power-off switches. Field Installation: Yes.

Extended Precision Floating Point (#3840). Extends the precision of floating point instructions to 28 hexadecimal digits.

Floating Point (#3900). Adds 44 floating point arithmetic instructions ... these, with the Standard Set, make up the Scientific Instruction Set. Field Installation: Yes.

Multiplexer Subchannels, Add'L (#3905-3907). To increase the number of I/O devices on the byte multiplexer channel, the number of subchannels can be increased by specifying one of the following: #3905 — for 64 subchannels ... #3907 — for 256 subchannels. The maximum number of shared subchannels is eight. When 256 subchannels are installed there are no shared subchannels. Maximum: One. Prerequisites: Field Installation: Yes. Prerequisite: Floating Point (#3900).

1401/1440/1460 COMPATIBILITY (#4457). Microprogrammed controlled feature, which, in conjunction with special software, permits the system to execute 1401/1440/1460 instructions. Field Installation: Yes.

IFA Conversion Feature (#4645). Permits co-residence of both 2319 Integrated File Adapter (#4650) and 3330/3340 Series Integrated File Adapter (#4655). Both IFAs are addressed as Channel 1. Maximum: One. Limitations: Cannot be installed if 3330/3340 Multiplexer (#9190) is specified ... cannot be installed with 3214/3340 Compatibility Feature (#8070). Field Installation: Yes. Prerequisites: 2319 Integrated File Adapter (#4650) and 3330/3340 Series IFA (#4655).

2319 Integrated File Adapter (#4650). Permits native attachment of a 2319 mdl A1 (and a 2319 mdl A3, 2312 mdl A1s or 2318 mdl A1) up to a total of 8 drives ... see item [4] under "Ordering Instructions" on the 2319. Standard features include file scan and record overflow functions. The IFA is always addressed as Channel 1. Maximum: One. Limitations: Cannot be installed if 3333/3330 Intermix (#9315) is specified under 3330/3340 Series IFA (#4655) ... cannot be installed with 2314/3340 Compatibility Feature (#8070). Field Installation: Yes. Prerequisites: IFA Conversion Feature (#4645) required if installed with 3330/3340 Series IFA (#4655).

3330/3340 Series Integrated File Adapter (#4655). Permits native attachment of up to two 3333s or 3340 mdl A2s. A maximum of ten 3330 or 3340 series drives can be attached to the IFA. The IFA supports rotational position sensing, disconnected command chaining and multiple requesting if the Block Multiplexer Channel (#1421) is installed. Record overflow is standard. For 3340, standard I/O addresses are (hex) 150 thru 15F. For 3340, standard addresses are (hex) ICO thru ICF. For 3340 with 3344, standard addresses are (hex) 1CO thru 1E1. Maximum: One. Field Installation: IFA Conversion Feature (#4645) is required if installed with 2319 IFA (#4650).

Specify [1] DASD Designation -- Specify ONE of the following -- #9313f (3333/3330) to attach up to two 3333 mdl 1s, each with up to three 3330 mdls 1/2 in any combination ... #9314f (3340), to attach up to two 3340 mdl A2s, each with up to three 3340 mdls B1/B2 in any combination ... #9315f (3333/3330 Intermix) to attach one 3333 mdl 1 (with up to three 3330 mdls) plus one 3340 mdl A2 (with up to three 3340 mdls B1/B2 in any combination). #9319f cannot be installed with IFA Conversion Feature (#4645).

[2] If any 3330 mdl 11 and/or 3330 mdl 11 is to be attached, also specify #9316f (3333/3330 mdl 11) in addition to #9313 or #9315.

With #9313 plus #9316, a mixture of one 3333 mdl 1 and one 3333 mdl 11, each with up to three 3330 mdls 1, 2 and 11 (in any combination) can be attached ... two 3333 mdl 11s, each with any mixture of up to three 3330 mdls 1, 2 and 11.

With #9315 plus #9316, one 3333 (either mdl 1 or mdl 11) with up to three 3330 mdls 1, 2 and 11 (in any combination) can be attached in addition to one 3340 mdl A2 with up to three associated mdls B1/B2. The maximum numbers with ... #9315f for 3330 are (HEX) 150 thru 15F, for 3340 (HEX) 158 thru 15F.

[3] If any 3344 is to be attached, specify #9317f in addition to #9314f (#9317 and #9319f are mutually exclusive). Maximum: One. Prerequisites: Specify #9314f also specified if 3344 mdl B2Fs or the 3340 Fixed Head Feature (#4301/4302) is ordered.

With #9314, #9317, and #9190 up to three 3344 mdl B2/B2F and/or 3340 mdl B2, B1 units in any combination can be attached to one 3340 mdl A2. The second 3340 mdl A2 if present can attach up to three 3340 mdl B1/B2 units.

#9317 is mutually exclusive with IFA Conversion Feature #4645 and with 2314/3340 Compatibility Feature (#8070).

[4] When #9314 is specified, also specify 3340 Address Designation: #9820f for addresses (HEX) 100 thru 11F. When #9821f for addresses (HEX) 160 thru 16F. The specification of 160 allows the 3135 IFA addresses to coincide with those of the 3115 and 3125 IFAs.

[5] When #9314 or #9315 is specified, also specify #9190f (Fixed Head Attachment) if Fixed Head Feature (#4301/4302) is ordered for any 3340 attached to the IFA.

[6] If String Switch (#8160) is ordered for any attached 3333 or 3340 mdl A2, specify String Switch Attachment (#9841f).

[7] When #9821f is specified in conjunction with #9313 the maximum addresses for the 3333/3330 mdls (HEX) 160 thru 16F.

[8] When #9821f is specified and both #9314 and #9317 are specified for the 3340/3344s are as follows:

<table>
<thead>
<tr>
<th>String</th>
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Physical Drive

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</table>

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### INTEGRATED PRINTER ADAPTER BASIC CONTROL (#4670).
Provides the power supply and basic control for a natively attached 1403 printer. The standard address is "00F." Specify: #9485 if optional address of "00F" is desired. Maximum: One. Field Installation: Yes. Note: If the optional address of "11F" for the Console Printer-Keyboard adapter (#3215 or #3211) and "00F" for the integrated 1403 are both used, Multiplexer Subchannels, Add1 (#3905) must be specified.

### INTEGRATED 1403 PRINTER MDL 2, MDL N1 ATTACHMENT (#4685). Adds control for attaching a 1403 printer to a mdl 2. Specify: #9185 to attach 1403 mdl 2. #9186 to attach 1403 mdl N1. Maximum: One. Field Installation: Yes. Prerequisites: Integrated Printer Adapter Basic Control (#4670). On the 1403, Voltage Adapter (#9709) and 600 LPM Voltage Conversion Adapter (#9725) are required on a mdl 2; 1100 LPM Voltage Conversion Adapter (#9726) is required on a mdl N1. See Specify under 1403.


### SELECTOR CHANNEL (#6981, 6982). Each adds a high-speed channel to the system. The channel permits overlapped I/O operation with processing. Eight control unit positions are provided on each channel; if an Integrated File Adapter (#4650 or #4655) is present, these channels are addressed as 2 and 3 respectively. Otherwise, they are addressed as 1 and 2. #6981 -- for first selector channel. #6982 -- for second. Field Installation: Yes. Prerequisites: #6981 requires #6982.

### S/360 MODEL 20 COMPATIBILITY (#7520). Microprogrammed controlled feature which, in combination with special software, permits the system to execute S/360 mdl 20 or S/360 mdl 25 in mdl 20 mode instructions. Field Installation: Yes.

### 3210 MDL 1 ADAPTER (#7844). To attach a 3210 Console Printer-Keyboard mdl 1 (15.5 cps) for systems console I/O ... includes an alter-display ability. Maximum: One. Limitation: Cannot be installed with 3215 Adapter (#7855). Field Installation: Yes. Prerequisite: Uses one address on the standard byte multiplexer channel, but does not use a control unit position. See 'Specify.'

### 3215 ADAPTER (#7855). To attach a 3215 Console Printer-Keyboard (95 cps) for systems console I/O ... includes alter-display ability. Maximum: One. Limitation: Cannot be installed with 3210 Mdl 1 Adapter (#7844). Field Installation: Yes. Prerequisite: Uses one address on the standard byte multiplexer channel, but does not use a control unit position. See 'Specify.'

### 12K CONTROL STORAGE INCREMENTS (#7861, 7862). Each adds 12,288 bytes of control storage. Required for some feature combinations ... see 'Control Storage Requirements' under 'Highlights' for details. #7861 -- for first 12K increment ... #7862 -- for second. Field Installation: Yes. Prerequisite: #7862 requires #7861.

### 2314/3340 COMPATIBILITY FEATURE (#8070). Permits the emulation of 2314/3319 volumes on the 3340 Disk Storage. The user program may access both the emulated 2314 data set as well as 3340 volumes. This provides a 'mixed-mode' operating environment. 'Mixed-mode' is only possible with D0G releases which support 3340 on the mdl 135. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with IFA Conversion Feature (#4645), 219 IFA (#4650), 3353/3340 Interface Mill (#9315), 3336 Attachment (#9317) or String Switch Attachment (#9841). Prerequisite: #9314 on 3330/3340 Series IFA (#4655).


### VIRTUAL MACHINE ASSIST (#8740). Provides assist to VS operating systems operating under VM/370 by emulation of certain privileged operations. Field Installation: Yes. Prerequisites: Clock Comparator and CPU Timer (#2001) and Floating Point (#3900).

### INTEGRATED COMMUNICATIONS ADAPTER (#4680). Provides the circuits and controls for direct attachment of up to eight teleprocessing lines to the 3135. The controls for the first line adapter are included in this feature. Lines can be any combination of Start/Stop or BSC. Provides for the attachment of 1050, 2260 mdl 1, 2260 mdl 2, 2265 mdl 1, 2740 mdl 1, 2740 mdl 2, 2741 mdl 1, 2760 mdl 1, 5010 Axx, or any IBM computer, multiplexer or terminal conforming to the Binary Synchronous Communications (BSC) standard. Note: In addition to the appropriate adapter, each communications line attached to the system requires an external modem.

### ADDITIONAL LINES (#4722 - 4728). Each provides circuits and controls for attachment of an additional line adapter ... for a total of eight lines in a system. Specify: Order additional line according to line position required ... see Table 1-A below. Each line specified requires the next lower order line as a prerequisite. Maximum: One of each (#4722 thru #4728). Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4680).

### SPECIFY REQUIREMENTS FOR INTEGRATED COMMUNICATIONS ADAPTER. For each line (#4722-4728) attached to the ICA, including the first line included in the 4680, one of the following line adapters must be specified: Terminal Adapter Type I Model II (#9721-9728), Terminal Adapter Type III (#9753-9760), Tele-
3135 Processing Unit (cont'd)

graph Adapter Type II (#9785-9792), or Synchronous Data Adapter Type II (#9649-9656). Each line adapter and all associated features must be specified according to the line position(s) they correspond. Refer to Table 2 below prior to ordering features for the ICA.

**TERMINAL ADAPTER TYPE I MODEL II** (#9721-9728).
Controls data transfers between the 3135 and 1050/2740 modl 1/2741/5010 modl Axx over facility C1 or D1, and between the 3135 and 2740 modl 2 or 5010 modl Axx over facility D1 or D2. Includes logical checking for 1060 terminal 2740 eqips with Record Checking (#6114). Specify: Refer to Table 1-B for appropriate feature code according to line position(s) desired. Special Requirements: See Table 2 below for additional specific requirements if Switched Network Facility, Write Interrupt, Unit Exception Suppression, Field 6032 or Autocall are required. Normal operation is at 134.5 bps, 600 Bits Per Second feature must be specified for operation at 600 bps to 2740s or 5010 modl Axx. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640).

**300 BITS PER SECOND** (#9593-9650).

denies. Field Installation: Yes. Prerequisite: Terminal Adapter Type I Model II.

Type I Model II or the Synchronous Data Adapter Type II to operate at 600 bps. Specify: Refer to Table 1-C for Terminal Adapter Type I Model II or Table 1-E for Synchronous Data Adapter Type II for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Terminal Adapter Type I Model II, or Synchronous Data Adapter Type II.

**SWITCHED NETWORK FACILITY** (#9625-9632).

Refer to Table 1-B for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Terminal Adapter Type I Model II.

Type I Model II or the Synchronous Data Adapter Type II to operate at 600 bps. Specify: Refer to Table 1-C for Terminal Adapter Type I Model II or Table 1-E for Synchronous Data Adapter Type II for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Terminal Adapter Type I Model II, or Synchronous Data Adapter Type II.

**WRITE INTERRUPT** (#9745-9752).

Refer to Table 1-B for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Terminal Adapter Type I Model II.

Model II to operate with a 2741 equipped with Transmit Interrupt (#7900). Not supported under BTAM, Q2M or Q3M. Specify: Refer to Table 1-C for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Terminal Adapter Type I Model II.

**UNIT EXCEPTION SUPPRESSION** (#9729-9736). If this feature is installed with Terminal Adapter Type I Model II, Unit Exception will not be supported under BTAM, Q2M or Q3M. Specify: Refer to Table 1-C for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Terminal Adapter Type I Model II.

**TERMINAL ADAPTER TYPE III** (#9753-9760).

Refer to Table 1-B for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640).

**MULTIPOINT** (#9761-9768).

Specifies that a Terminal Adapter Type III is to operate in multipoint mode. If #9761-9768 is not ordered for a given Terminal Adapter Type III, point-to-point operation is presumed. Specify: Refer to Table 1-D for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Terminal Adapter Type III.

**MODEM CLOCKING** (#9609-9616).

Refer to Table 1-D for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Terminal Adapter Type III or Synchronous Data Adapter Type II.

**NEW SYNC** (#9808-9815).

Provides control of data transfers between the 3135 and either remote 2845 Display Console or a Synchronous Data Adapter Type II. Specify: Refer to Table 1-B for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640) and Switched Network Network (#9625-9632).

**SYNCHRONOUS DATA ADAPTER TYPE II** (#9649-9656).

Provides control of data transfers between the 3135 and either remote 2845 Display Console or a Synchronous Data Adapter Type II. Specify: Refer to Table 1-B for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640) and Switched Network Network (#9625-9632).

SPECIAL REQUIREMENTS: See Table 2 below for additional specific requirements if Switched Network Facility, Write Interrupt, Unit Exception Suppression, Field 6032 or Autocall are required. Normal operation is at 134.5 bps, 600 Bits Per Second feature must be specified for operation at 600 bps to 2740s or 5010 modl Axx. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640).

**SPECIAL REQUIREMENTS**

Refer to Table 1-B and features below for additional specific requirements if Half Duplex Facility, Transparent, Tributary Station, Switched Network or EON are required. Specify: Refer to Table 1-E for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640).

**TRANSPARENT** (#9673-9680).

Provides the Synchronous Data Adapter Type II with the ability to transmit and receive 8-bit binary as well as EBCDIC or ASCII codes ... or 6-bit binary data as well as 6-bit Transcode. This feature with ASCII modifies VRC/LRC checking to VRC/CRC checking. Limitation: ASCII code and Transparency cannot be installed together for the same line position when attached to the 2770, 2780, 3735, 3780, System/3, System/7, System/32 or System/34. Specify: Refer to Table 1-E for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Synchronous Data Adapter Type II.

EON (#9801-9807).

Automatically generates an EON digit at the end of the dial sequence. Specify: Refer to Table 1-E for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Synchronous Data Adapter Type II.

CPU Diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $405 on purchased machines to include any number of diskette-only changes ordered on same diskette.

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TABLE I-B
FEATURES

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<th>FEATURE</th>
<th>Additional Lines</th>
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<tr>
<td>Flexible Subchannel Adapter</td>
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<tr>
<td>Emergency Power-Off Control</td>
<td>for up to 2 switches</td>
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<tr>
<td>Extnd Precision Fltng Point</td>
<td>230/240 230/240 230/240</td>
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<td>Floating Point</td>
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Before ordering, check Special Feature write-ups for Prerequisites and Limitations.

TABLE I-A
ADDITIONAL LINE APPEARANCES

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TABLE I-B
TERMINAL ADAPTERS

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$ CPU diskette-only feature. No fee when ordered at time of manufacture or when charged feature that supplies diskette. $405 on purchased machines to include any number of diskette-only changes ordered on the same diskette.

+ Feature supplies CPU diskette.

** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. $405 on purchased machines when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.

TABLE I-C
OPTIONS FOR TERMINAL ADAPTER TYPE I MODEL II

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<td>Unit Excess Supress</td>
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TABLE I-D
OPTIONS FOR TERMINAL ADAPTER TYPE III

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TABLE I-E
OPTIONS FOR SYNCHRONOUS DATA ADAPTER TYPE II

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TABLE I-F
OPTIONS FOR TELEGRAPH ADAPTER TYPE II

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<tr>
<td>Telegraph Adapter</td>
<td>9785 9786 9787 9788 9789 9790 9791 9792</td>
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<td>Autocal</td>
<td>9777 9778 9779 9780 9781 9782 9783 9784</td>
<td></td>
<td></td>
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(1) 6-Bit Transcode can be used only with a 2780 Data Transmission Terminal.

M 3135.6
Jul 79

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<table>
<thead>
<tr>
<th>Terminal</th>
<th>IBM Modem</th>
<th>Line Speed (Bits/sec)</th>
<th>Communication Line and Modem Facilities</th>
<th>Features Required</th>
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</thead>
<tbody>
<tr>
<td>3135.7</td>
<td></td>
<td></td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td></td>
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<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td>2740 Display Station Model 1</td>
<td></td>
<td></td>
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<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
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<td></td>
<td></td>
<td>600</td>
<td>Terminal Adapter Type I Model II; and 600 Bits Per Second</td>
</tr>
<tr>
<td>2745 Display Station Model 1</td>
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<td></td>
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<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
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<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
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<tr>
<td>2746 Optical Image Unit Model I</td>
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<td>Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Write Interrupt; and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td>2845 Display Control Model 1 (point-to-point or multipoint)</td>
<td>3872 Model 1</td>
<td>300</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and 300 Bits Per Second Line Speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Write Interrupt; and 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td>2845 Display Control Models 1, 2 and 3 (point-to-point or multipoint)</td>
<td>3872 Model 1</td>
<td>300</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and 300 Bits Per Second Line Speed</td>
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<tr>
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<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Write Interrupt; and 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td>3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (without interrupt feature)</td>
<td>300</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Write Interrupt, 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td>3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Receive Interrupt feature)</td>
<td>300</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility, Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Read Interrupt, 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)</td>
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<td></td>
</tr>
<tr>
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<td>D1</td>
<td>Terminal Adapter Type I Model II; and Read Interrupt, and 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)</td>
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<td>300</td>
<td>C1</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Read Interrupt, and 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)</td>
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<td>3767 Communications Terminal Model 1 or 2 or 3 with (#7112) - 2740-2 Line Control</td>
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<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
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<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
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<tr>
<td>System/7</td>
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<td>134.5</td>
<td>C1</td>
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<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
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TABLE 2 -- Part I (cont'd)

<table>
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<tr>
<th>5100/5110 Computer Systems</th>
<th>3135 Processing Unit (cont'd)</th>
<th>C1</th>
<th>Terminal Adapter Type I Model II, and Switched Network Facility, Read Interrupt, Write Interrupt, and Unit-Exception Suppression (if required)</th>
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<tbody>
<tr>
<td>300</td>
<td></td>
<td>C1</td>
<td>Terminal Adapter Type I Model II, and Switched Network Facility, Read Interrupt, Write Interrupt, and Unit-Exception Suppression (if required)</td>
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<tr>
<td>TTY 33/35</td>
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<td>C2</td>
<td>Telegraph Adapter Type II</td>
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TABLE 2 -- Part 2

<table>
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<tr>
<th>Line Speed (Bits/Sec)</th>
<th>IBM Modem</th>
<th>Manner of Line Operation</th>
<th>Communication Line and Modem Facilities</th>
<th>Features Required</th>
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<tr>
<td>600</td>
<td>3872 Model I</td>
<td>Point-to-Point</td>
<td>D3 (two-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Half Duplex Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>C3</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Switched Network Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multipoint - 3135 as Control Station</td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multipoint - 3135 as Tributary Station</td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
</tr>
<tr>
<td>1200</td>
<td>3872 Model I</td>
<td>Point-to-Point</td>
<td>D3 (two-wire)</td>
<td>Synchronous Data Adapter Type II, and Half Duplex Facility, and Data Code Features</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multipoint - 3135 as Control Station</td>
<td>C4</td>
<td>Synchronous Data Adapter Type II, and Switched Network Facility, and Data Code Features</td>
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<td></td>
<td>Multipoint - 3135 as Tributary Station</td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Data Code Features</td>
</tr>
<tr>
<td>2400</td>
<td>3874 Model I</td>
<td>Point-to-Point</td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Half Duplex Facility, and Data Code Features</td>
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<td></td>
<td>D4</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Switched Network Facility, and Data Code Features</td>
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<tr>
<td>2400</td>
<td>3874 Model I</td>
<td>Multipoint - 3135 as Control Station</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multipoint - 3135 as Tributary Station</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II, and Data Code Features</td>
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<tr>
<td>4800</td>
<td>3875 Model I</td>
<td>Point-to-Point</td>
<td>D5</td>
<td>Synchronous Data Adapter Type II, and Modem Clocking; and Switched Network Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D6 (with C2 conditioning)</td>
<td>Synchronous Data Adapter Type II, and Modem Clocking; and Data Code Features</td>
</tr>
</tbody>
</table>

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IBM 3135-3 PROCESSING UNIT

Purpose: Provides a performance improvement for S/370 mdl 135 models H, HF, HG and I only.

Model
A1* 262,144 Bytes of Processor Storage
A2* 327,680 Bytes of Processor Storage
A3* 393,216 Bytes of Processor Storage
A4* 524,288 Bytes of Processor Storage

NOTE: The 3135-3 is available as a non-removable, field installable upgrade to a S/370 model 135 ml d H, HF, HG and I only.

- The complete systems assurance review/approval at the branch office level required before ordering.

Highlights: Depending on the model, up to 524,288 bytes of processor storage are available. CPU cycle time varies from 275 to 1485 nanoseconds depending upon the internal operation being performed. Sixteen general purpose and four floating point registers are provided.

Standard Features Include: APL Assist, Audible Alarm, Byte Oriented Operand, 1 Byte Multiplexer Channel, 64 Byte Multiplexer Subchannels, Channel Command Retry, Channel Indirect Addressing, Clock Comparator and CPU Timer, Conditional Swapping, Console File, Control Registers, Dynamic Address Translation, Error Reading and Correction (On Main and Control Storage), Extended Control Mode, Extended Control-Program Support, Instruction Retry, Interval Timer, Machine Check Handling, OS/OS0S Compatibility, Program Event Recording, Storage Protection (Store and Fetch), S/370 Universal Instruction Set (Floating Point included), Time of Day Clock, and PSW Key Handling.

Control Storage: 131,072 bytes of Reloadable Control Storage are provided for each model in addition to the applicable main storage. This feature permits emulator and control routines to function. The Reloadable Control Storage is housed in the CPU and is loaded from the Console File. Reloadable Control Storage is not addressable by the user.

Virtual Storage: Virtual Storage capability is provided to increase the effective utilization of main storage.

Console File (standard): This is the basic microprogram loading device for the system. The console file contains a small file device that provides all of the microcode for the system on removable magnetic disks. The several disks that will be supplied with the system will supply all of the required microcode for FE diagnostics, basic systems features, plus the optional features ordered for the system.

Console Function: Operator communications with the system is via a system control panel located on the 3135-3 and a 3210 model 1 or 3215 Console Printer-Keyboard as on other models of the S/370 model 135. A right reading board extension is standard ... a left extension is not available.

Input/Output Channels:

Byte Multiplexer Channel -- one is standard ... functionally equivalent to the byte multiplexer channel on the S/370 model 135 ... provides eight control unit positions ... in byte mode, permits simultaneous operation of many low-speed devices. Burst mode operation of unbuffered devices operating in excess of 10KB is not allowed for concurrent operation with the Integrated File Adapter. The Integrated Communications Adapter, or the Block Multiplexer Channel -- see IBM S/370 Model 135 Channel Characteristics Manual, GA33-3010 for further clarification ... for OS exclusion, refer to SRL GC29-6554, System Generation.

Block Multiplexer Channels -- two are available as special features ... data rates are 1.3 megabytes per second ... permits simultaneous operation of high-speed devices ... ability to "Block Multiplex" provides greater channel efficiency ... devices on these channels which cannot utilize block multiplexing will function as if attached to selector channels ... if the 3330/3340 Series Integrated File Adapter is present these channels are addressed as 2 and 3 respectively. Otherwise they are addressed as 1 and 2.

Subchannels -- on the byte multiplexer channel 64 subchannels are provided as standard with the option of 128 or 256 (see "Special Features") ... on each of the two available block multiplexer channels, 16 non-shared subchannels and 1 shared subchannel are provided as standard with the option of 5 non-shared and 9 shared or 8 non-shared and 5 shared (see "Special Features") ... on a block multiplexer channel a single shared subchannel may attach a control unit having a maximum of 16 device addresses.

Non-native -- a wide variety of I/O devices may be attached to the functional models of the S/370 model 135 via the standard byte multiplexer channel, and/or the optional block multiplexer channel(s). In particular, any I/O device which is attachable to a 3135 is attachable to the 3135-3.

Native -- the following integrated I/O attachments/adapters are provided for controlling the designated I/O devices.

Console Printer-Keyboard (Required) -- this unit serves as the on-line I/O device for operator/system communications. It provides a means of manually entering data into the system, altering or displaying data already in storage, and for printing error logout messages.

2319 Integrated File Adapter (#4650) (Optional) -- this feature enables native attachment of a 2319 Disk Storage Mdl A1 **, and a 2319 mdl A3 **, 2312 mdl A1 ** or 2318 mdl A1 **) up to a total of eight drives. The IFA is addressed as channel 1. LIMITATION: Cannot be installed if 3333/3340 Intermix (#8515) is specified when 3332/3340 Series IFA (#4655) is also ordered.

3330/3340 Series Integrated File Adapter (#4655) (Optional) -- this feature allows the native attachment of one or two 3333 modules or 3340 mdl A2 units. Each 3333 module (either mdl 1 or mdl 11) can attach up to three 3330 modules (any combination of mdls 1, 2 or 11). Each 3340 mdl A2 can attach 3340 mdl B2 or B1 units and one 3340 mdl A2 can also attach 3344 units to a maximum of eight drives. Maximum is sixteen drives per IFA. If 2319 IFA (#4650) is also present, IFA Conversion Feature (#4645) is also ordered.

Integrated Communications Adapter (Optional) -- this feature provides attachment of up to eight teleprocessing lines to the 3135-3. These may be any combination of supported BSC and Start/Stop lines and appear to the processor as if connected via one or more 2701a on the byte multiplexer channel.

Integrated Printer Adapter (Optional) -- this feature enables native attachment of a 1403 Printer mdl 2, 7 or N1. The Universal Character Set Feature can be optionally specified on the 1403 mdl 2 or N1.

Programming Features:

APL Assist (standard) -- this feature is an APL emulator. It replaces functions performed by the APL software interpreter. This feature can provide a performance improvement for many APL applications when used with VS APL PP #5748 AP1.

Conditional Swapping (standard) -- provides two additional instructions ... Compare and Swap ... Compare Double and Swap.

PSW Key Handling (standard) -- provides two additional instructions ... Insert PSW Key ... Set PSW Key from Address.

Extended Control Program Support (standard) -- the 3135-3 processor models of the S/370 mdl 135 include Extended Control-Program Support. This is a hardware assist that reduces the CPU time needed to execute certain frequently used supervisor functions in both VS and VM/370.

The functional areas for VM/370 include:

Virtual Machine I/O
Storage Management
Page Management
SVIC Handler
Privileged Instruction Interfaces
Dispatching
Virtual Interval Timer

For VS-1 the functional areas are:

Storage Management
IO5
SVIC FLII
System Trace
Page Management

PREREQUISITES: The following prerequisites apply to each 3135-3 processor model.

(1) 3046 Power Unit ... see 3046.

(2) Extended Precision Floating Point Feature (#3840) ... see 3135 Processing Unit Special Features.

Bibliography: GC20-0001

Specify: (1) Voltage: 115V, 60Hz; #9003 for 208 V, or #9908 #1 230 V.

(2) Cabling: #9008 for below the floor, or #9001 for on the floor.

(3) Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

** No longer available.

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3135-3 Processing Unit (cont'd)

[4] Console Printer-Keyboard Address: Recorded on console file for X'01F'.


[6] Console Printer-Keyboard: A 3210 model 1 or 3215 Console Printer-keyboard is required in every system... see 3210, 3215 and "Special Features."

[7] Shipping Instructions: Unless otherwise specified, shipping dimensions of the 3135 Frame 01 (CPU) are 31-1/2" wide x 70" long x 60" high. Removal of the side covers will reduce the width to 29-1/2". If further reduction in length is required, specify 9570. Shipping dimensions will then be 29-1/2" wide x 60" long x 60" high.

NOTE: RENT/370 ... CE access is by telephone.

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**Model Upgrade Purchase Prices**

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>A1</th>
<th>A2</th>
<th>A3</th>
<th>A4</th>
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<td>$120,000</td>
<td>$141,900</td>
<td>$163,800</td>
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<tr>
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<td></td>
<td>$120,000</td>
<td>$141,900</td>
<td>$163,800</td>
<td>$207,600</td>
<td>$120,055</td>
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<tr>
<td>I</td>
<td></td>
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<td>$163,800</td>
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<td>$21,900</td>
<td>$43,800</td>
<td>$87,600</td>
<td>$170,300</td>
<td>$120,055</td>
</tr>
</tbody>
</table>

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**Special Features**

**Block Multiplexer Channel** (#1425, 1426). Each adds a block multiplexer channel with 16 non-shared subchannels and 1 shared selector subchannel to the system. #1425 -- first #1426 -- second. If the 3330/3340 Series Integrated File Adapter is present these channels are addressed as 2 and 3 respectively. Otherwise they are addressed as 1 and 2. Field Installation: Yes. Prerequisite: #1426 requires #1425.

**Block Multiplexer Shared Subchannels** (#1431).

Note: This feature should only be installed if devices See 370 I/O Configuration Form GA20-7002. Allows any one of the following combinations of "Non-Shared," "Block Shared," or selector subchannels to be attached to the block multiplexer channel: [1] 1 Block Shared and 1 Shared Selector (see address restrictions) ... [2] 8 Non-Shared, 8 Block Shared, and 1 Shared Selector (see address restrictions) ... [3] 8 Non-Shared, 4 Block Shared, and 1 Shared Selector (see address restrictions). If option [2] is selected, then each block shared subchannel may have attached to it a control unit having a maximum of 16 device addresses. If option [3] is selected, the four block shared subchannels may each have attached a control unit having a maximum of 32 device addresses. If option [1] is selected, no Non-Shared subchannels are available, and addresses X00 through X7F are not available. With any option, the selector subchannel may have attached to it control units with a maximum of 16 device addresses. This feature will apply to both selector channels if installed. The options are selectable by the Customer Engineer and may be defined differently.

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3135-3 Processing Unit (cont’d)

### 3135-3, 3330/3340 IFA (#4655)

#### CHANNEL PRIORITY (#1501)
When the IFA (#4650 or #4655) and both block multiplexer channels are present, this feature changes the higher priority for command chaining from the first block multiplexer channel (Channel 2) to the second block multiplexer channel (Channel 3). #1501 is required if any DASD devices are to be attached to Channel 3. Field installation: Yes. Prerequisites: Integrated File Adapter (#4650 or #4655) and both Block Multiplexer Channels (#1425 and #1426).

#### DIRECT CONTROL (#3274)
Provides two instructions, Read Direct and Write Direct, and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. Maximum: One. Cable Order: Required. Field Installation: Yes. Prerequisites: External devices must meet the interface specifications outlined in S/360 Direct Control Feature - OEM, GA22-6845.

#### EMERGENCY POWER-OFF CONTROL (#3621, 3622)
Provides a single emergency power-off switch in a "room" or "area". See Emergency Power-Off Control under S/370 mod 135 in "Systems." #3621 -- to interconnect two emergency power-off switches. #3622 -- to interconnect up to twelve emergency power-off switches. Field Installation: Yes.

#### EXTENDED PRECISION FLOATING POINT (#3840)
[Prerequisite for 3135-3] For description, see M 3135 pages. 1401/1440/1460 COMPATIBILITY (#4457). Microprogrammed controlled feature, which, in conjunction with special software, permits the system to execute 1401/1440/1460 instructions. Field Installation: Yes.

#### IFA CONVERSION FEATURE (#4645)
Permits co-residence of both 2319 Integrated File Adapter (#4650) and 3330/3340 Series IFA (#4655). Both IFAs are addressed as Channel 1. Maximum: One. Limitations: Cannot be installed if 3333/3340 Intermix (#9315) or 3344 Attach (#9317) is specified... Cannot be installed with 2314/3340 Compatibility Feature (#8070). Field Installation: Yes. Prerequisites: 2319 Integrated File Adapter (#4650) and 3330/3340 Series IFA (#4655).

2319 INTEGRATED FILE ADAPTER (#4650).
Permits native attachment of a 2319 mod A1 (and a 2319 mod A3, 2312 mod A1s or 2318 mod A1) up to a total of 8 drives... See item [4] under "Intermix Instructions" in the 2319. Standard features include file scan and record overflow functions. The IFA is always addressed as Channel 1. Maximum: One. Limitations: Cannot be installed if 3333/3340 Intermix (#9315) is specified under 3330/3340 Series IFA (#4655) ... cannot be installed with 2314/3340 Compatibility Feature (#8070). Field Installation: Yes. Prerequisites: IFA Conversion Feature (#4645) if installed with 3330/3340 Series IFA (#4655).

#### INTEGRATED PRINTER ADAPTER BASIC CONTROL (#4670)
Provides the power supply and basic control for a natively attached 1403 Printer. The standard address is "OOF." Specify: #9485 if optional address of "OEE" is desired. Maximum: One. Field Installation: Yes.

#### INTEGRATED 1403 PRINTER MDL 2, MDL N1 ATTACHMENT (#4672)
Provides control for attaching 1403 mod 2 or N1. Specify: #9182f to attach 1403 mod 2, #918bf to attach 1403 mod N1. Maximum: One. Field Installation: Yes. Prerequisites: Integrated Printer Adapter Basic Control (#4670). On the 1403, Voltage Adapter (#9709) and 600 LPM Voltage Conversion Adapter (#9725) are required on a mod 2; 1100 LPM Voltage Conversion Adapter (#9726) is required on a mod N1. See Specify under 1403.

#### INTEGRATED 1403 PRINTER MDL 7 ATTACHMENT (#4677)

S/360 MODEL 20 COMPATIBILITY (#7520). Microprogrammed controlled feature which, in conjunction with special software, permits the system to execute S/360 mod 20 LPM in mod 20 mode instructions. Field Installation: Yes.

3210 MDL 1 ADAPTER (#7844). To attach a 3210 Console Printer-Keyboard mod 1 (15.5 cps) for systems console I/O...

---

Note: The DASD control combinations that can be attached to the 3330/3340 Series IFA (#4655) are shown in the left hand column of the table below. From Section A of the table select one of the feature numbers shown (one and only one must be selected). From Section B select the feature number(s) required to support your configuration (select none, one or more than one from Section B). Section C of the table shows the addresses available. The specification of the (HEX) 160 addresses allows the 3135-3 IFA addresses to coincide with those of the 3115 and 3125 IFA. Select a number from Section C if required.

---

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3135-3 Processing Unit (cont'd)

includes an alter-display ability. Maximum: One. Limitation: Cannot be installed with 3215 Adapter (#7855). Field Installation: Yes. Prerequisite: Uses one address on the standard byte multiplexer channel, but does not use a control unit position. See 'Specify'.

3215 ADAPTER (#7855). To attach a 3215 Console Printer-Keyboard (65 cps) for systems console I/O ... includes alter-
display ability. One. Limitation: One. Limitation: Cannot be used with 3210 Mdl 1 Adapter (#7844). Field Installation: Yes. Prerequisite: Uses one address on the standard byte multiplexer channel, but does not use a control unit position. See 'Specify'.

2314/3340 COMPATIBILITY FEATURE (#8070). Permits the emulation of 2314/2319 volumes on the 3340 Disk Storage. The user program access both the emulated 2314 data set as well as 3340 volumes. Provides a "mixed-mode" operating environment. "mixed-mode" is only possible with DOS releases which support 3340 on the 3135-3. Maximum: One. 3135-3.4

2314/3340 String Switch (see M 3135-3.4 Jul 79). Includes data transfers between the 3135-3 and other terminals and devices such as 3210 Mdl 1, 2740 Mdl 1, and 5010 Mdl Axx. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640).
TELEGRAPH ADAPTER TYPE II (#9785-9792). Controls data transfers between ICA and Model 33/35 TTY terminals (8 level code at 110 bps only) with facility C2. Specify: To Table 1-B for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640) and Switched Network Facility (#9625-9632).

SYNCHRONOUS DATA ADAPTER TYPE II (#9649-9656). Provides control of data transfers between the 3135-3 and binary synchronous terminals. See "Binary Synchronous Terminals" under 2701 Data Adapter Unit. Control Station is included with this feature. Specify: Refer to Table 1-B for appropriate feature code according to line position(s) desired. Speed Selection: Provides operation over C3, D2 and D3 facilities at 600 bps if 600 Bits Per Second feature is specified... see above. Provides operation over C4 and D3 facilities at 1200 bps (no speed need be specified). Provides operation over C5 facility at 2000 bps if Modem Clocking is specified... see above. Provides operation over C5, D4 or X1M at 2400 bps, over C6, D5 or X2M at 4800 bps, or over D6 at 7200 bps... see above. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640).

Special Requirements: See Table 1-E and features below for additional specific requirements if Hal Duplex Facility, Transparency, Tributary Station, Switched Network Facility, Autocall, EON, or New Sync are required. See Table 1-E and 600 Bits Per Second above 600 bps if Speed is required. See Table 1-E and Modem Clocking above 2000 bps, 2400 bps, 4800 bps, or 7200 bps operation is required. The appropriate Data Code feature must be specified if other than EBCDIC is required as the primary data code... see Data Code Features below.

Limitations: For line speed limitations refer to Model 135 Channel Characteristics Manual, GA33-3010.

HALF DUPLEX FACILITY (#9617-9624). Required if the Synchronous Data Adapter Type II is attached to a two-wire facility. Note: This feature is not required with Switched Network (#9625-9632) or Tributary Station (#9665-9672). Specify: To Table 1-E for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Synchronous Data Adapter Type II.

TRIBUTARY STATION (#9665-9672). Required when a Synchronous Data Adapter Type II is installed and functioning on a leased communications line as a tributary station and not functioning as a control station. Specify: To Table 1-E for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Synchronous Data Adapter Type II.

DATA CODE FEATURES. The primary data code for the SDA Type II is EBCDIC. As an option to EBCDIC either ASCII or 6-bit Transcode (2780 Data Transmission Terminal only) may be specified as the primary code. In addition to the primary code, an alternate data code, selected under program control, may be specified for the Synchronous Data Adapter Type II. EBCDIC, ASCII, or 6-bit Transcode may be selected as an alternate code. Specify: To Table 1-E for appropriate feature codes according to line position(s) desired. Field Installation: Yes. Prerequisite: Synchronous Data Adapter Type II.

TRANSPARENCY (#9673-9680). Provides the Synchronous Data Adapter Type II with the ability to transmit and receive 8-bit binary as well as EBCDIC or ASCII codes... 6-bit binary data as well as 6-bit Transcode. This feature with ASCII modifies VRC/LRC checking to VRC/LRC checking. Limitation: ASCII code and Transparency cannot be installed together for the same line position. For Table #2770, 2780, 3735 and 3766 System/3, System/7, System/32 or System/34. Specify: To Table 1-E for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Synchronous Data Adapter Type II.

EON (#9801-9807). Automatically generates an EON digit at the end of the dial sequence. Specify: To Table 1-E for appropriate feature code according to line position(s) desired. Specify for 3872 and 3874 Modem with EON option. Field Installation: Yes. Prerequisites: Autocall (#1290). Synchronous Data Adapter Type II.

Modems Up to eight modems can be attached to a 3135, any model. Prerequisites: Integrated Communications Adapter (#4640) and Synchronous Data Adapter Type II (#9649-9656) 2400 bps to 600 bps, Terminal Adapter Type II Model II (#9728) 134.5 bps to 600 bps, or Terminal Adapter Type III (#9753-9760) 1200 bps or 2400 bps. See feature descriptions for limitations.

Note: For communications capabilities, product utilization and special features, see 3863, 3864, 3872, 3874, 3875 and M 2700 pages.

### Modem Speed (bps)

- 3863: 2400
- 3872: 2400
- 3874: 4800
- 3875: 7200

---

Before ordering, check Special Feature write-ups for Prerequisites and Limitations.

<table>
<thead>
<tr>
<th>TABLE I-A</th>
<th>ADDITIONAL LINE APPEARANCES</th>
<th>Line Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature</td>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
</tr>
<tr>
<td>AUTOMATIC DIALER</td>
<td>4723 4724 4725 4726 4727 4728</td>
<td></td>
</tr>
<tr>
<td>ADDITIONAL LINES</td>
<td>in 4640/4722 4723 4724 4725 4726 4727 4728</td>
<td></td>
</tr>
</tbody>
</table>

Specify additional lines according to line position.

<table>
<thead>
<tr>
<th>TABLE I-B</th>
<th>TERMINAL ADAPTERS</th>
<th>Line Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature</td>
<td>1 2 3 4 5 6 7 8</td>
<td></td>
</tr>
<tr>
<td>TERMINAL ADAPTER</td>
<td>4723 4724 4725 4726 4727 4728</td>
<td></td>
</tr>
</tbody>
</table>

Specify terminal adapter for each line position specified in TABLE I-A.

Note: CPU diskette-only feature spec. No fee when ordered at time of manufacture or when field installed. $405 on purchased machines to include any number of diskette-only changes ordered on the same diskette.

---

IBM 3135-3 Processing Unit (cont'd)

offering New Sync. Note: New Sync is NOT required if Half Duplex Facility (#9617-9624), Tributary Station (#9665-9672), or Switched Network (#9625-9632) is installed for the line position in question.

### TLP/ MRC Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature Code</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autocall</td>
<td>$1.290</td>
</tr>
<tr>
<td>Direct Control</td>
<td>$1.324</td>
</tr>
<tr>
<td>Emergency Power-Off Control for 2 switches</td>
<td>$1.362</td>
</tr>
<tr>
<td>Extended Precision Filing</td>
<td>$1.434</td>
</tr>
<tr>
<td>Multiplexer Subchannels, Add1</td>
<td>$1.434</td>
</tr>
<tr>
<td>128 subchannels</td>
<td>$1.390</td>
</tr>
<tr>
<td>256 subchannels</td>
<td>$1.390</td>
</tr>
<tr>
<td>1401/1440/1460 Comptlty</td>
<td>$1.457</td>
</tr>
<tr>
<td>Integrated Comms.</td>
<td>$1.460</td>
</tr>
<tr>
<td>IFA Conversion Fee</td>
<td>$1.465</td>
</tr>
<tr>
<td>2319 Intgrd File Adapter</td>
<td>$1.465</td>
</tr>
<tr>
<td>33/33/340 Series IFA</td>
<td>$1.465</td>
</tr>
<tr>
<td>Int Prntr Adptr Basic Cntrl</td>
<td>$1.467</td>
</tr>
<tr>
<td>Int 1403 Prntr -2,-N1 Attach</td>
<td>$1.467</td>
</tr>
<tr>
<td>Int 1403 Prntr -7 Attach</td>
<td>$1.467</td>
</tr>
</tbody>
</table>

### Limitations:

- For line speed limitations refer to Model 135 Channel Characteristics Manual, GA33-3010.
- The Primary data code for the SDA Type II is EBCDIC. As an option to EBCDIC either ASCII or 6-bit Transcode (2780 Data Transmission Terminal only) may be specified as the primary code. In addition to the primary code, an alternate data code, selected under program control, may be specified for the Synchronous Data Adapter Type II. EBCDIC, ASCII, or 6-bit Transcode may be selected as an alternate code. Specify: To Table 1-E for appropriate feature codes according to line position(s) desired. Field Installation: Yes. Prerequisite: Synchronous Data Adapter Type II.
- Transparency (#9673-9680) provides the Synchronous Data Adapter Type II with the ability to transmit and receive 8-bit binary as well as EBCDIC or ASCII codes... 6-bit binary data as well as 6-bit Transcode. This feature with ASCII modifies VRC/LRC checking to VRC/LRC checking. Limitation: ASCII code and Transparency cannot be installed together for the same line position. For Table #2770, 2780, 3735 and 3766 System/3, System/7, System/32 or System/34. Specify: To Table 1-E for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Synchronous Data Adapter Type II.
- EON (#9801-9807) automatically generates an EON digit at the end of the dial sequence. Specify: To Table 1-E for appropriate feature code according to line position(s) desired. Specify for 3872 and 3874 Modem with EON option. Field Installation: Yes. Prerequisites: Autocall (#1290). Synchronous Data Adapter Type II.

---

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### TABLE I-C
#### OPTIONS FOR TERMINAL ADAPTER

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>Line Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 bps $f$</td>
<td>9593 9594 9595 9596 9597 9598 9599 9600</td>
</tr>
<tr>
<td>600 bps $f$</td>
<td>9601 9602 9603 9604 9605 9606 9607 9608</td>
</tr>
<tr>
<td>Switched Netw Facility $f$</td>
<td>9625 9626 9627 9628 9629 9630 9631 9632</td>
</tr>
<tr>
<td>Read Interrupt $f$</td>
<td>9737 9738 9739 9740 9741 9742 9743 9744</td>
</tr>
<tr>
<td>Write Interrupt $f$</td>
<td>9745 9746 9747 9748 9749 9750 9751 9752</td>
</tr>
<tr>
<td>Unit Excep Suppress $f$</td>
<td>9729 9730 9731 9732 9733 9734 9735 9736</td>
</tr>
<tr>
<td>Autocall</td>
<td>9777 9778 9779 9780 9781 9782 9783</td>
</tr>
</tbody>
</table>

### TABLE I-D
#### OPTIONS FOR TERMINAL ADAPTER TYPE III

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>Line Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multipoint $f$</td>
<td>9761 9762 9763 9764 9765 9766 9767 9768</td>
</tr>
<tr>
<td>New Sync $f$</td>
<td>9808 9809 9810 9811 9812 9813 9814 9815</td>
</tr>
<tr>
<td>Modem Clocking</td>
<td>9609 9610 9611 9612 9613 9614 9615 9616</td>
</tr>
</tbody>
</table>

Select modem clocking feature for each line position for which Terminal Adapter Type III is specified and operation at 2400 bps is desired.

### TABLE I-E
#### OPTIONS FOR SYNCHRONOUS DATA ADAPTER TYPE II

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>Line Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparency $f$</td>
<td>9673 9674 9675 9676 9677 9678 9679 9680</td>
</tr>
<tr>
<td>600 BPS $f$</td>
<td>9601 9602 9603 9604 9605 9606 9607 9608</td>
</tr>
<tr>
<td>Switched Netw Facility $f$</td>
<td>9625 9626 9627 9628 9629 9630 9631 9632</td>
</tr>
<tr>
<td>Half Duplex Facility $f$</td>
<td>9617 9618 9619 9620 9621 9622 9623 9624</td>
</tr>
<tr>
<td>Tributary Station $f$</td>
<td>9665 9666 9667 9668 9669 9670 9671 9672</td>
</tr>
<tr>
<td>New Sync $f$</td>
<td>9808 9809 9810 9811 9812 9813 9814 9815</td>
</tr>
<tr>
<td>EON $f$</td>
<td>9801 9802 9803 9804 9805 9806 9807</td>
</tr>
</tbody>
</table>

Select features required for each line position for which Synchronous Data Adapter Type II is specified.

### OPTIONAL PRIMARY DATA CODES

| ASCII $f$                | 9681 9682 9683 9684 9685 9686 9687 9688 |
|                         | Select one of the above data codes if required in lieu of EBCDIC for each line position for which Synchronous Data Adapter Type II is specified. |

### OPTIONAL ALTERNATE DATA CODES

| ASCII $f$                | 9705 9706 9707 9708 9709 9710 9711 9712 |
| 6-Bit Transcode (1) $f$  | 9713 9714 9715 9716 9717 9718 9719 9720 |

Select one of the above Alternate Data Codes if required for each line position for which Synchronous Data Adapter Type II is specified.

### TABLE I-F
#### OPTIONS FOR TELEGRAPH ADAPTER TYPE II

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>Line Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tel Adptr Type II $f$</td>
<td>9785 9786 9787 9788 9789 9790 9791 9792</td>
</tr>
<tr>
<td>Autocall</td>
<td>9777 9778 9779 9780 9781 9782 9783</td>
</tr>
<tr>
<td>Switched Netw Facility $f$</td>
<td>9625 9626 9627 9628 9629 9630 9631 9632</td>
</tr>
</tbody>
</table>

(1) 6-Bit Transcode can be used only with a 2780 Data Transmission Terminal.

---

$\text{CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette.} \text{ $405 on purchased machines to include any number of diskette-only changes ordered on same diskette.}$

---

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## FEATURES REQUIRED FOR START/STOP TERMINALS

<table>
<thead>
<tr>
<th>Terminal</th>
<th>IBM Modem</th>
<th>Line Speed (Bits/sec)</th>
<th>Communication Line and Modem Facilities</th>
<th>Features Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1050 Data Communication System</td>
<td></td>
<td>134.5</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td>2260 Display Station Model 1</td>
<td></td>
<td>134.5</td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td>2260 Display Station Model 2</td>
<td></td>
<td>134.5</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td>2365 Display Station Model 1</td>
<td></td>
<td>134.5</td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td>2741 Communication Terminal Model 1</td>
<td></td>
<td>134.5</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td>2740 Communication Terminal Model 2</td>
<td></td>
<td>134.5</td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td>2741 Communication Terminal Model 1 (without interrupt feature)</td>
<td></td>
<td>600</td>
<td>D2</td>
<td>Terminal Adapter Type I Model II; and 600 Bits Per Second</td>
</tr>
<tr>
<td>2741 Communication Terminal Model 1 (with Receive Interrupt Feature)</td>
<td></td>
<td>134.5</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td>2741 Communication Terminal Model 1 (with Transmit Interrupt feature)</td>
<td></td>
<td>134.5</td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Write Interrupt; and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td>2845 Display Control Model 1 - see this table</td>
<td>3872 Model 1</td>
<td>3872 Model 1</td>
<td>D3</td>
<td>Terminal Adapter Type III multipoint for multipoint operation</td>
</tr>
<tr>
<td>2845 Display Control Models 1, 2 and 3 (point-to-point or multipoint)</td>
<td>3872 Model 1</td>
<td>3872 Model 1</td>
<td>D4</td>
<td>Terminal Adapter Type III and Modem Clocking multipoint for multipoint operation and New Sync (if required)</td>
</tr>
<tr>
<td>3756 Communications Terminal Model 1 or 2 with (97113) - 2741 Line Control (without interrupt feature)</td>
<td>300</td>
<td>1200</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility; and Write Interrupt; and 300 Bits Per Second Line Speed</td>
</tr>
<tr>
<td>3756 Communications Terminal Model 1 or 2 with (97113) - 2741 Line Control (with Transmit Interrupt feature)</td>
<td>300</td>
<td>1200</td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and 300 Bits Per Second Line Speed</td>
</tr>
<tr>
<td>3756 Communications Terminal Model 1 or 2 with (97113) - 2741 Line Control (with Receive Interrupt and Transmit Interrupt features)</td>
<td>300</td>
<td>1200</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility; Read Interrupt; and 300 Bits Per Second Line Speed</td>
</tr>
<tr>
<td>3756 Communications Terminal Model 1 or 2 with (97113) - 2740-1 Line Control</td>
<td>300</td>
<td>1200</td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Read Interrupt; and 300 Bits Per Second Line Speed</td>
</tr>
<tr>
<td>System/7</td>
<td></td>
<td>1200</td>
<td>D2</td>
<td>Terminal Adapter Type I Model II; and 600 Bits Per Second Line Speed</td>
</tr>
</tbody>
</table>

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### TABLE 2 -- Part 1 (cont'd)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Required Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Adapter Type I Model II, and Switched Network Facility, Read Interrupt, Write Interrupt, and Unit-Exception Suppression (if required)</td>
<td>C1</td>
</tr>
<tr>
<td>Terminal Adapter Type I Model II, and Read Interrupt, Write Interrupt, and Unit-Exception Suppression (if required)</td>
<td>D1</td>
</tr>
<tr>
<td>Terminal Adapter Type I Model II, and Switched Network Facility, Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)</td>
<td>C1</td>
</tr>
<tr>
<td>Terminal Adapter Type I Model II, and Read Interrupt, Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)</td>
<td>D1</td>
</tr>
</tbody>
</table>

**5100/5110 Computer Systems**

<table>
<thead>
<tr>
<th>Code</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>134.5</td>
<td>D1</td>
</tr>
<tr>
<td>300</td>
<td>C1</td>
</tr>
</tbody>
</table>

**TTY 33/35**

<table>
<thead>
<tr>
<th>Code</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>110</td>
<td>C2</td>
</tr>
<tr>
<td>33/35</td>
<td></td>
</tr>
</tbody>
</table>

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### TABLE 2 -- Part 2

<table>
<thead>
<tr>
<th>Line Speed (Bits/Sec)</th>
<th>IBM Modem</th>
<th>Manner of Line Operation</th>
<th>Communication Line and Modem Facilities</th>
<th>Features Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td></td>
<td>Point-to-Point</td>
<td>D3 (two-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Half Duplex Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C3</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Switched Network Facility, and Data Code Features</td>
</tr>
<tr>
<td>1200</td>
<td></td>
<td>Multi-point -- 3135 as Control Station</td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multi-point -- 3135 as Control Station</td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multi-point -- 3135 as Control Station</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Switched Network Facility; and Data Code Features</td>
</tr>
<tr>
<td>2400</td>
<td>3863</td>
<td>Point-to-Point</td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>2400</td>
<td>3863</td>
<td>Multi-point - 3135 as Control Station</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Switched Network Facility; and Data Code Features</td>
</tr>
<tr>
<td>2400/3863</td>
<td></td>
<td>Multi-point - 3135 as Control Station</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking; and Half Duplex Facility; and Switched Network Facility; and Data Code Features</td>
</tr>
<tr>
<td>2400</td>
<td>3872 Model I</td>
<td>Point-to-Point</td>
<td>C5</td>
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<td>D4 (two-wire)</td>
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<td>D6 (with C2 conditioning)</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking; and Data Code Features</td>
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</table>

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Purpose: Provides main and control storage plus arithmetic and logic circuits for the S/370 mdl 138.

Model I 524,288 bytes of processor storage

Model J 1,048,576 bytes of processor storage

Highlights: 524,288 bytes or 1,048,576 bytes of processor storage are provided. CPU cycle time ranges from 275 to 1485 nanoseconds depending on the internal operation being performed. Sixteen general purpose and four floating point registers are provided.

Standard Features Include: Conditional Swapping ... APL Assist ... Audible Alarm ... Byte Oriented Operand ... 1 Byte Multiplexer Channels ... 64 Byte Multiplexer Subchannels ... 2 Block Multiplexer Channels ... 16 Non-Shared Block Multiplexer Subchannels ... 1 Shared Block Multiplexer Subchannel ... Channel Command Retry ... Console File ... Control Registers ... Dynamic Address Translation ... Error Checking and Correction (on Main and Control Storage) ... Extended Control Mode ... Extended Control-Program Support ... Extended Precision Floating Point ... Instruction Retry ... Floating Point ... Interval Timer ... Machine Check Handling ... OS/VS Compatibility ... Program Event Recording ... Storage Protection (Store and Fetch) ... S/370 Universal Instruction Set ... Time of Day Clock ... PSW Key Handling.

Control Storage: 131,072 bytes of Reloading Control Storage are provided in addition to main storage. This permits emulator and control routines to function. The Reloading Control Storage is housed in the CPU and is loaded from the Console File. Reloading Control Storage is not available to the user.

Virtual Storage: Virtual Storage capability is provided to increase the effective utilization of main storage.

Console File (Standard): This is the basic microprogram loading device for the system. The console file contains a small file device that provides all of the microcode for the system on removable magnetic disks. The several disks that will be supplied with the system will supply all of the required microcode for FE diagnostics, basic systems features, plus the optional features ordered for the system.

Console Function: A display console is standard ... includes a cathode ray tube, and a keyboard ... functions as an operator's I/O console to communicate with the operating system ... standard attachment of an optional 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 for hard copy output. CRT can accommodate twenty-four 80-character lines of information. A system control panel is also located on the 3138 for additional operator communication with the system. Three console modes are available: "Keyboard-Printer" Mode, "Display" Mode, and "115/125 Console-Display-Emulation" Mode.

In "Printer-Keyboard" mode, the display console uses the keyboard for input and the CRT and a recommended 3286 Printer mdl 2 or 3287 mdl 1 and 2 for output. The CRT, keyboard and printer appear to the system as a 3215 Console Printer-Keyboard. "Printer-Keyboard" mode is supported by DOS, DOS/VS, OS/360, OS/VS and VM/370.

In "Display" mode, the keyboard is used for input, the CRT with 24 lines by 80 characters/line for output, and DIODCS or equivalent support is required. DOS/VS does not support Display Mode. The 3286 Printer mdl 2 or 3287 Printer mdl 1 or 2 (optional) has a separate address and requires MCS support or equivalent. When present the printer appears to the system as a 3213 Console Printer.

In "115/125 Console-Display-Emulation" mode, the keyboard is used for input, the CRT is used for output, and the CRT displays twelve, 56-character lines of information. The 3286 Printer mdl 2 or 3287 mdl 1 or 2 are optional. When present, the printer emulates a 5213 Printer mdl 1 and acts as a slave unit to the display console. That is, the 3286 mdl 2 or 3287 mdl 1 or 2 are not separately addressable in this mode. The "115/125 Console-Display-Emulation" mode is available in DOS/VS Rel. 26 and above.

The display console provides the capability to select three aspects of the system's environment at IMPL time:

Console mode - See above (Mode Descriptions)

CPU mode (3138 or 3135) - See Programming Features

Unit addresses of natively attached I/O

Integrated Communications Adapter Line Characteristics - See Integrated Communications Adapter Features

These selections will be recorded on the console file for permanent or reuse until such time as any new selection is made during a subsequent IMPL. (Note: This is the only user access to the console file.) A right reading board extension is standard ... a left extension is not available.

Input/Output Channels:

Byte Multiplexer Channel: One is standard functionally equivalent to the byte multiplexer channel on the S/370 mdl 135 ... provides eight control unit positions ... in byte mode, permits simultaneous operation of many low-speed devices ... burst mode operation of unbuffered devices operating in excess of 10KB is not allowed for concurrent operation with the Integrated File Adapter, the Integrated Communications Adapter, or a Block Multiplexer Channel - see IBM S/370 M 3138 Channel Characteristics Manual, GA24-3633 for further clarification ... for OS exclusion refer to SRL GC28-6654, "System Generation."

Block Multiplexer Channels: Two are standard ... data rates are 1.3 megabytes per second ... permits simultaneous operation of high-speed devices ... ability to "Block Multiplex" provides greater channel efficiency and increases the efficiency of the 3330/3340 Series IFA when using direct access storage devices equipped with statistical position sensing devices on these channels which cannot utilize block multiplexing will function as if attached to selector channels ... if the 3330/3340 Series Integrated File Adapter is present these channels are addressed as 2 and 3 respectively. Otherwise they are addressed as 1 and 2.

Subchannels: On the byte multiplexer channel 64 subchannels are provided as standard with the option of 128 or 256 (see "Special Features") ... for each of the two standard block multiplexer channels 16 non-shared subchannels and 1 shared selector subchannel are provided as standard. In the option of 8 non-shared and 9 shared or 8 non-shared and 5 shared (see "Special Features") ... each of the standard single shared subchannels may attach a control unit having a maximum of 16 device addresses.

Non-Native: A wide variety of I/O devices may be attached to the S/370 model 138 via the standard byte multiplexer channel or any of the 2 standard block multiplexer channels.

Native: The following integrated I/O attachments/adapters are provided for controlling the designated I/O devices:

Integrated 3203-4 Printer Attachment, First Printer (Optional) Provides the capability to natively attach the 3203 Printer mdl 4 as the first systems printer. The Universal Character Set feature is standard on the 3203.

Integrated 3203-4 Printer Attachment, Second Printer (Optional) - Provides the capability to natively attach the 3203 Printer mdl 4 as the second systems printer. The Universal Character Set feature is standard on the 3203.

Integrated 1403 Printer Adapter (Optional) - This feature allows native attachment of a 1403 Printer mdl 2, 7, or 11 ... the Universal Character Set Feature can be optionally specified on the 1403mdl 2 or 11.

Integrated Console Printer Adapter (Standard) - Provides the capability to natively attach the optional 3286 Printer mdl 2, 3287 mdl 1 and 2 as a hard copy console printer.

3330/3340 Series Integrated File Adapter (Optional) - This feature allows the native attachment of one or two 3333 modules or 3340 mdl A2 units ... each 3333 module (either mdl 1 or mdl 11) can attach up to three 3330 modules (any combination of mdls 1, 2 or 11). When attached to a 3340 mdl A2 can attach 3340 mdl b2 or b1 units, and one 3340 mdl A2 can also attach 3344 units to a maximum of eight drives ... maximum is sixteen drives per IFA.

Integrated Communications Adapter (Optional) - This feature provides attachment of up to eight teleprocessing lines to the S/370 mdl 138 ... these may be any combination of supported BSC and Start/Stop lines and appear to the processor as if connected via one or more 2701s on the byte multiplexer channel.

Integrated Communications Adapter Features: To improve the ordering of the ICA on the S/370 mdl 138 the user may define, from the display-console-keyboard, the following line characteristics for each line installed (a maximum of 8 lines are attachable to the ICA):

[1] Leased Facility* or Switched Network Facility: Allows the Terminal Adapter Type I Model II, Synchronous Data Adapter Type II (SDA), or Telegraph Adapter Type II to operate over leased or C type switched lines.

[2] Half Duplex Facility or Full Duplex Facility* - Allows the user to make a business tradeoff between his TP applications and turn-around requirements and available teleprocessing facilities

* These options will comprise the standard microcode on the console file as shipped from the plant. They may be altered as explained from the display-console-keyboard at the operator's discretion.

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and the cost of those facilities... half-duplex is required if the
Sync Data Adapter Type II is attached to a two-wire
facility or that facility is part of a switched network unless that
facility is a leased line and the Synchronous Data Adapter
Type II is installed and functioning as a tributary station and
not functioning as a control station on that leased line.

[3] Primary Code for the SDA Type II (EBCDIC*, ASCII, 6-Bit)

[4] Secondary or Alternate Code for the SDA Type II (EBCDIC*,
ASCII, 6-Bit)

[5] Tributary Station Allows the user to specify a station
address As of any Synchronous Data Adapter Type II
which is installed and functioning on a leased communications
line as a tributary station and not functioning as a control
station on that leased line. (Station address 0829*). Only
addresses A to R are valid.

[6] Line Speed
(a) 134 bps*, 300 bps, or 600 bps for Terminal Adapter Type
1 Model II.
(b) 600 bps or 1200 bps* for Synchronous Data Adapter Type
II.
(c) Not applicable for Terminal Adapter Type III or Telegraph

[7] Transparency - Yes or No* - Provides the SDA Type II with the
ability to transmit and receive 6-bit binary as well as EBCDIC
or ASCII codes or 6-bit binary data as well as 6-bit
modulo binary checking. This feature combines the
ASCII and Line Code checking into a single feature.

[8] Write Interrupt - Yes or No* - Allows the Terminal Adapter
Type II to operate with a 2741 equipped with Receive
Interrupt (#7408) ... LIMITATIONS: Not supported under
BTAM, QTAM, or TCAM ... PREREQUISITE: Terminal Adapter
Type I Model II.

[9] Read Interrupt - Yes or No* - Allows the Terminal Adapter
Type I Model II to operate with a 2741 equipped with Receive
Interrupt (#7408) ... LIMITATIONS: Not supported under
BTAM, QTAM, or TCAM ... PREREQUISITE: Terminal Adapter
Type I Model II.

[10] New Sync - Yes or No* - Allows the Synchronous Data Adap-
ter Type II or Terminal Adapter Type III to be connected to
modems which offer the New Sync feature option and have
this option installed ... New Sync minimizes modem turnaround
and allows faster bit synchronization of the following data...
PREREQUISITES: Modern Clocking (#9606-9610), and
a modem offering New Sync. NOTE: New Sync is not required if
Half-Duplex Facility, Tributary Station, or Switched Network is
selected for the line position in question.

[11] Multipoint - Yes or No* - Specifies that a Terminal Adapter
Type III to operate in multipoint. If multipoint is not
selected for a given Terminal Adapter Type III, point-to-point
operation is presumed. PREREQUISITE: Terminal Adapter
Type III.

[12] Unit Exception Suppression - Yes or No* - If selected with
Terminal Adapter Type I Model II, Unit Exception will not be set
in response to a Circle C... LIMITATION: Not supported under
BTAM, GTAM, or TCAM ... PREREQUISITE: Terminal Adapter
Type I Model II.

Note: See 'Special Features' for optional 'ICA features' on the
S/370 model 138.

Also, if the user wishes to have the capability to "run" on 5/370 md1 138 any SCP which will "run" today on a S/370 model 135, recovery from error capabilities will be experienced in
this mode. That is, in 3135 CPU Mode the improved hardware
performance of the S/370 mdl 138 will be available to the user.
Moreover the user will have the same recovery capabilities on the
S/370 md1 138 as he has on a S/370 md1 135 when 3135
CPU Mode is selected. NOTE: S/370 md1 138 Extended
Lock/EREPI is not supported in this mode.

Extended Control Program Support (Standard): The S/370
model 138 includes Extended Control-Program Support. This is
a hardware assist that reduces the CPU time needed to execute
frequent commands used in VS-1 and
VM/370.

The functional areas for VM/370 include:
Virtual Machine I/O
Storage Management
Page Management
SVC Handler
Privileged Instruction Interfaces
Dispetching
Virtual Interval Timer
For VS-1 the functional areas are:
Storage Management
IOS
SVC FLH
System Trace
Page Management

Prerequisite: Each S/370 mod 138 requires a 3046 power unit ... see 3046.

Bibliography: GC20-0001

Specify:
[1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or
#9905 for 230 V.
[2] Cabling: #9090 for below the floor, or #9081 for on the floor.
[3] Color: #9041 for red, #9042 for yellow, #9043 for blue,
#9045 for gray, or #9046 for white.


[5] Shipping Instructions: Unless otherwise specified, shipping
dimensions of the 3138 Frame 01 (CPU) are 21-1/2" wide x
70" long x 60" high. Removal of the side covers will reduce
the width to 29-1/2". If further reduction in length is required,
specify #9570. Shipping dimensions will then be 29-1/2"
wide x 60" long x 60" high.

NOTE: RETAIN/370 ... CE access is by telephone.

Prices: MdI  MLC  4-Yr Purchase MMMC
3138 I $ 9,600 $ 8,730 $222,900 $1,275
J  11,120 10,115 250,400 1,335

Plan Offering: Plan A, Additional Use Charge Rate: 10%.
Metering: Base Unit: A, Additional Use Charge Rate: 10%. For
Call: A, Additional Use Charge Rate: 10%. For

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional
installation charges)
From Model I to Model J ..... $37,500

SPECIAL FEATURES

BLOCK MULTIPLEXER SHARED SUBCHANNEL (#1431). Note:
This feature should be installed only if devices capable of "Block Shared"
operation are installed on the block multiplexer channel. See
370 I/O Configuration Form GA22-7002. Allows any one of
the following combinations of "Non-Shared", "Block Shared" or
selector subchannels to be attached to the block multiplexer channel:
[1] 16 Non-Shared and 1 Selector (see address restrictions)... [2] 8 Non-Shared, 8 Block Shared and 1 Selector (see address restrictions)
[3] 8 Non-Shared, 4 Block Shared and 1 Selector (see address restrictions). If option
[2] is selected, then each block shared channel may have
attached to it a control unit having a maximum of 16 device
addresses. If option [3] is selected, the four block shared channels
each may have attached a control unit having a maximum of
32 device addresses. If option [3] is selected, no block shared
subchannels are available, and addresses X00 through X7F are
not available. With any option, the selector subchannel may have
attached to it control units with a maximum of 16 device
addresses. This feature will apply to both selector channels if installed.
The options are selectable by the Customer Engineer and may be

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3138 Processing Unit  (cont'd)
defined differently on each channel. Maximum: One. Field Installation: Yes.
Address Restrictions with #1431
a) Addresses X00 through X7F are assigned as block shared subchannels. With option [1] they may not be used. With option [2] each control unit address position, i.e., X00, X10, X20, etc., through X70 is available. With option [3] address positions only are available, i.e., 00, 20, 40 and 60.
b) Selector and Non-Shared addresses are limited to addresses X80 through XFF.

CHANNEL PRIORITY (#1502). When the IFA (#4655) is present, this feature changes the higher priority for command chaining from the first block multiplexer channel (Channel 2) to the second block multiplexer channel (Channel 3). #1502 is required if any DASD devices are to be attached to Channel 3. Field Installation: Yes. Prerequisite: Integrated File Adapter (#4655).

DIRECT CONTROL (#3274). Provides two instructions, Read Direct and Write Direct, and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. Maximum: One. Cable Order: Required. Field Installation: Yes. Prerequisites: External devices must meet the interface specifications outlined in S/360 Direct Control Feature - OEM, GA22-6844.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide a single emergency power-off switch in a "room" or "area". See Emergency Power-Off Control under S/370... #3622 -- to interconnect up to twelve emergency power-off switches. Field Installation: Yes.

MULTIPLEXER SUBCHANNELS, ADD'L (#3906, 3907). To increase the number of I/O devices on the byte multiplexer channel, the number of subchannels can be increased by specifying one of the following: ... #3906 -- for 128 subchannels ... #3907 -- for 256 subchannels. The maximum number of shared subchannels is eight. When 256 subchannels are installed there are no shared subchannels. Note: The number of subchannels ordered must be equal to or greater than the device addresses. Also see "Byte Multiplexer Channel" under "Input/Output Channels" above. Field Installation: Yes.

1401/1440/1460 COMPATIBILITY (#4457). Microprogrammed controlled feature, which, in conjunction with special software, permits the system to execute 1401/1440/1460 instructions. Field Installation: Yes.

3330/3340 SERIES INTEGRATED FILE ADAPTER (#4655). Permits native attachment of up to two 3333s or 3340 mld A2s. A maximum of sixteen 3330 or 3340 series drives can be attached to the IFA. The IFA supports rotational position sensing, disconnected command chaining and multiple requesting. Record overflow standard. For 3340, standard I/O addresses are (hex) 150 thru 15F. For 3340, standard addresses are (hex) ICO thru ICF. For 3340 with 3344, standard addresses are (hex) ICO thru 1E1.

Specify:
[1] DASD Designation -- Specify ONE of the following -- #9313f (3333/3334) to attach up to two 3333 mld 1s, each with up to three 3330 mlds 1/2 in any combination ... #9314f (3340 only) to attach up to two 3340 mld 2xs, each with up to three 3340 mlds B1/B2 in any combination ... #9315f (3333/3340 Intermix) to attach one 3333 mld 1 (with up to three 3330 mlds 1/2 in any combination) plus one 3340 mld A2 (with up to three 3340 mlds B1/B2 in any combination).

[2] If any 3333 mld 11 and/or 3330 mld 11 is to be attached, also specify #9316f (3333/3330 mld 11) in addition to #9313 or #9315.
With #9313 plus #9316, a mixture of one 3333 mld 1 and one 3330 mld 11, each with up to three 3330 mlds 1, 2, and 11 (in any combination) can be attached ... or two 3333 mld 11s, each with any mixture of up to three 3330 mlds 1, 2 and 11.
With #9315 plus #9316, one 3333 (either mld 1 or mld 11) with up to three 3330 mlds 1, 2 and 11 (in any combination) can be attached in addition to one 3340 mld A2 with up to three associated mlds B1/B2. The standard addresses with #9315 for 3330 are (hex) 150 thru 15F, for 3340 (hex) 158 thru 15F.

[3] If any 3344 is to be attached specify #9317f in addition to #9314 (#9317 and #9315 are mutually exclusive). #9190f must also be specified if 3344 mld B2Fs or the 3340 Fixed Head Feature (#4301/4302) is ordered.

Note: The DASD control combinations that can be attached to the 3330/3334 Series IFA (#4655) are shown in the left hand column of the table. Section A of the table select one of the feature numbers shown (one and only one must be selected). From Section B select the feature number(s) required to support your configuration (select none, one or more than one from Section B). Section C of the table shows the addresses available. The specification of the (HEX) 160 addresses allows the 3138 IFA addresses to coincide with those of the 3115 and 3125 IFAs. Select a number from Section C if required.

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With #9314, #9317, and #9190 up to three 3344 mld B2/B2F and/or 3340 mld B2, B1 units in any combination can be attached to one 3340 mld A2. The second 3340 mld A2 if present can attach up to three 3340 mld B1/B2 units.

[4] When #9314 is specified, also specify 3340 Address Designation. #9820f for addresses (hex) ICO thru 1CF, or #9821f for addresses (hex) 160 thru 16F. The specification of 160 allows the 3138 IFA addresses to coincide with those of the 3115 and 3125 IFAs.

[5] When #9314 or #9315 is specified, also specify #9190f (Fixed Head Attachment) if Fixed Head Feature (#4301/4302) is ordered for any 3340 attached to the IFA.

[6] If String Switch (#8150) is ordered for any attached 3333 or 3340 mld A2, specify String Switch Attachment (#9841f).

[7] When #9821f is specified in conjunction with #9313 the addresses for the 3333/3330s are (HEX) 160 thru 16F.

[8] When #9821f is specified and both #9314 and #9317 are specified the addresses for the 3340/3344s are as follows:

| String 0 | 160 | 161 |
| String 1 | 168 | 169 |... | 3344 B2/B2Fs...

| Drive | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Drive | 3340 A2 | ... | 3340 B2s... |

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$ CPU diskette-only specify feature. No fee when ordered at time of manufacture or with changeable feature that supplies diskette. $40 on purchased machines to include any number of diskette-only changes ordered on same diskette.
INTEGRATED 1403 PRINTER ADAPTER BASIC CONTROL (#4670). Provides the power supply and basic control for a natively attached 1403 Printer. Maximum: One. Field Installation: Yes.

INTEGRATED 1403 PRINTER MLDL 2, MLN 1 ATTACHMENT (#4672). Provides control for attaching 1403 ml2 or N1. Specify: #4652 to attach 1403.ml2 or #4692 to attach 1403.ml1. Maximum: One. Field Installation: Yes. 


MULTIPLEXER INSTALLATION (#8637). The use of the Universal Character Set adapter on a 1403 Printer ml2 or N1 attached via the Integrated 1403 Printer ml2, ml1 N1 Attachment (#4672). Maximum: One. Field Installation: Yes. 

INTEGRATED COMMUNICATIONS ADAPTER (#4640). Provides the circuits and controls for direct attachment of up to eight teleprocessing lines to the S/370. The controls for the first line adapter are included in this feature. Lines can be any combination of Start/Stop or BSC. Provides for the attachment of 1050, 2260, ml2, 2260 ml2, 2265 ml1, 2740 ml1, 2740 ml2, 2741 ml1, 2760 ml1, 5010 Axx or any IBM computer multiplexers or terminal conforming to the Binary Synchronous Communications (BSC) standard. Note: In addition to the appropriate adapter, each communications line attached to the system requires an external modem.

Refer to Table 2 below to define customer configuration requirements.

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<td>DASD Design</td>
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<td>and/or 3330</td>
<td>3344</td>
<td></td>
</tr>
<tr>
<td>Mdl 11</td>
<td>3344 Mdl B2F</td>
<td></td>
</tr>
<tr>
<td>Fixed Head</td>
<td>String Switch</td>
<td>*</td>
</tr>
<tr>
<td>Feature</td>
<td>#8102 on</td>
<td>HEX 150-15F</td>
</tr>
<tr>
<td>#3021 on</td>
<td>3340</td>
<td>9821</td>
</tr>
<tr>
<td>3340</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3340</td>
<td>Compatibility</td>
<td>Feature</td>
</tr>
<tr>
<td>(see</td>
<td>(see</td>
<td>#4670)</td>
</tr>
<tr>
<td></td>
<td>#4670)</td>
<td></td>
</tr>
</tbody>
</table>

* No feature number required.
** Mutually exclusive with String Switch #9841, 2319 IFA (#4650), IFA Conversion feature (#4645), 3344 Attachment (#9317).

Additional tables and specifications are provided for various components and configurations.
basically 2400 bps modems, offer a 1200 bps half speed facility. Since the requirements for the Modem Clocking feature are defined by the type of modem, not the line speed, when such modems are attached to the Synchronous Data Adapter Type II and are switched for 1200 bps operation, Modem Clocking is still required as a prerequisite on the ICA. Specify: Refer to Table 1-D for Terminal Adapter Type III or Table 1-E for Synchronous Data Adapter Type II for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Terminal Adapter Type III or Synchronous Data Adapter Type II.

TELEGRAPH ADAPTER TYPE II (#9785-9792). Controls data transfers between ICA and Model 33/35 TTY terminals (8 level code at 110 bps only) with facility C2. Specify: Refer to Table 1-B for appropriate feature code according to line position(s) desired. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640) and Switched Network Facility selection from the display console.

SYNCHRONOUS DATA ADAPTER TYPE II (#9649-9656). Provides control of data transfers between the 3138 and binary synchronous terminals. See ‘Binary Synchronous Terminals’ under 2701 Data Adapter Unit. Control Station is included with this feature. Specify: Refer to Table 1-B for appropriate feature code according to line position(s) desired. Speed Selection: Provides operation over C3, D2 and D3 facilities at 600 bps if 600 Bits Per Second is selected from the display console. Provides operation over C4 and D3 facilities at 1200 bps (no speed need be specified). Provides operation over C5M facility at 2000 bps if modem clocking is provided ... see above. Provides operation over C5, D4 or D4M of 1200 bps, over C6, D5 or X2M at 4800 bps, or over D6 at 7200 bps ... see above. Field Installation: Yes. Prerequisite: Integrated Communications Adapter (#4640).

SPECIAL REQUIREMENTS: See Table 1-E for additional specify requirements if Autocall or EON are required. See Table 1-E and Modem Clocking above if 2000 bps, 2400 bps, 4800 bps, or 7200 bps operation is required. The appropriate Data Code must be selected from the display console.


EON (#9901-9807). Automatically generates an EON digit at the end of the dial sequence. Specify: Refer to Table 1-E for appropriate feature code according to line position(s) desired. Specify for 3872 and 3874 Modem with EON option. Field Installation: Yes. Prerequisites: Autocall (#1290) ... Synchronous Data Adapter Type II.

MODEMS: Up to eight modems can be attached to a 3138. Prerequisites: Integrated Communications Adapter (#4640) and Synchronous Data Adapter Type II (#9649-9656) 2400 bps to 7200 bps, Terminal Adapter Type I Model II (#9721-9728) 134.5 bps to 600 bps, or Terminal Adapter Type III (#9753-9760) 1200 bps or 2400 bps. See feature descriptions for limitations.

** Modem Speed (bps)

<table>
<thead>
<tr>
<th>Modem</th>
<th>Speed (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3863</td>
<td>2400</td>
</tr>
<tr>
<td>3872</td>
<td>2400</td>
</tr>
<tr>
<td>3864</td>
<td>4800</td>
</tr>
<tr>
<td>3874</td>
<td>4800</td>
</tr>
<tr>
<td>3875</td>
<td>7200</td>
</tr>
</tbody>
</table>

Note: for communications capabilities, product utilization and special features, see 3961, 3964, 3972, 3974, 3975 and M 2700 pages.
Before ordering, check Special Feature write-ups for Prerequisites and Limitations.

**TABLE I-A**  
**ADDITIONAL LINE APPEARANCES**  

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Adapter Type II $\S$</td>
<td>9721</td>
<td>9722</td>
<td>9723</td>
<td>9724</td>
<td>9725</td>
<td>9726</td>
<td>9727</td>
<td>9728</td>
</tr>
<tr>
<td>Terminal Adapter Type III $\S$</td>
<td>9753</td>
<td>9754</td>
<td>9755</td>
<td>9756</td>
<td>9757</td>
<td>9758</td>
<td>9759</td>
<td>9760</td>
</tr>
<tr>
<td>Synchronous Data Adapter Type II $\S$</td>
<td>9649</td>
<td>9650</td>
<td>9651</td>
<td>9652</td>
<td>9653</td>
<td>9654</td>
<td>9655</td>
<td>9656</td>
</tr>
</tbody>
</table>

Specify additional lines according to line position.

**TABLE I-B**  
**TERMINAL ADAPTERS**  

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terminal Adapter Type I Model II</td>
<td>9721</td>
<td>9722</td>
<td>9723</td>
<td>9724</td>
<td>9725</td>
<td>9726</td>
<td>9727</td>
<td>9728</td>
</tr>
<tr>
<td>Terminal Adapter Type II</td>
<td>9753</td>
<td>9754</td>
<td>9755</td>
<td>9756</td>
<td>9757</td>
<td>9758</td>
<td>9759</td>
<td>9760</td>
</tr>
<tr>
<td>Synchronous Data Adapter Type II</td>
<td>9649</td>
<td>9650</td>
<td>9651</td>
<td>9652</td>
<td>9653</td>
<td>9654</td>
<td>9655</td>
<td>9656</td>
</tr>
</tbody>
</table>

Any adapter added, removed, or relocated to another line position requires reconfiguration of the entire line. Select one terminal adapter for each line position specified in **TABLE I-A**.

**TABLE I-C**  
**OPTIONS FOR TERMINAL ADAPTER TYPE I MODEL II**  

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autocall</td>
<td>9777</td>
<td>9778</td>
<td>9779</td>
<td>9780</td>
<td>9781</td>
<td>9782</td>
<td>9783</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE I-D**  
**OPTIONS FOR TERMINAL ADAPTER TYPE III**  

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modem Clocking</td>
<td>9609</td>
<td>9610</td>
<td>9611</td>
<td>9612</td>
<td>9613</td>
<td>9614</td>
<td>9615</td>
<td>9616</td>
</tr>
<tr>
<td>Modem Clocking</td>
<td>9801</td>
<td>9802</td>
<td>9803</td>
<td>9804</td>
<td>9805</td>
<td>9806</td>
<td>9807</td>
<td></td>
</tr>
</tbody>
</table>

Select modem clocking feature for each line position for which Terminal Adapter Type III is specified and operation at 2400 bps is desired. Select features required for each line position for which Synchronous Data Adapter Type II is specified.

**TABLE I-E**  
**OPTIONS FOR SYNCHRONOUS DATA ADAPTER TYPE II**  

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modem Clocking</td>
<td>9609</td>
<td>9610</td>
<td>9611</td>
<td>9612</td>
<td>9613</td>
<td>9614</td>
<td>9615</td>
<td>9616</td>
</tr>
<tr>
<td>Modem Clocking</td>
<td>9801</td>
<td>9802</td>
<td>9803</td>
<td>9804</td>
<td>9805</td>
<td>9806</td>
<td>9807</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE I-F**  
**OPTIONS FOR TELEGRAPH ADAPTER TYPE II**  

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telegraph Adapter Type II</td>
<td>9785</td>
<td>9786</td>
<td>9787</td>
<td>9788</td>
<td>9789</td>
<td>9790</td>
<td>9791</td>
<td>9792</td>
</tr>
</tbody>
</table>

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### TABLE 2 - Part I

**FEATURES REQUIRED FOR START/STOP TERMINALS**

<table>
<thead>
<tr>
<th>Terminal</th>
<th>IBM Modem</th>
<th>Line Speed (Bits/sec)</th>
<th>Communication Line and Modem Facilities</th>
<th>Features Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>1050 Data Communication System</td>
<td></td>
<td>134.5</td>
<td>CI</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DI</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td>2260 Display Station Model 1</td>
<td></td>
<td></td>
<td>Connects via 2848 Display Control Model 3 - see this table</td>
<td></td>
</tr>
<tr>
<td>2260 Display Station Model 2</td>
<td></td>
<td></td>
<td>Connects via 2848 Display Control Model 1 or 2 - see this table</td>
<td></td>
</tr>
<tr>
<td>2265 Display Station Model 1</td>
<td></td>
<td></td>
<td>Connects via the 2845 Display Control Model 1 - see this table</td>
<td></td>
</tr>
<tr>
<td>2740 Communication Terminal Model 1</td>
<td></td>
<td>134.5</td>
<td>CI</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td>2740 Communication Terminal Model 2</td>
<td></td>
<td>134.5</td>
<td>CI</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and 600 Bits Per Second</td>
</tr>
<tr>
<td>2741 Communication Terminal Model 1 (without interrupt feature)</td>
<td></td>
<td>600</td>
<td>CI</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td>2741 Communication Terminal Model 1 (with Receive Interrupt Feature)</td>
<td></td>
<td>134.5</td>
<td>CI</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Write Interrupt and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td>2741 Communication Terminal Model 2 (with Transmit Interrupt feature)</td>
<td></td>
<td>134.5</td>
<td>CI</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Read Interrupt and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td>2741 Communication Terminal Model 1 (with Transmit Interrupt features)</td>
<td></td>
<td>134.5</td>
<td>CI</td>
<td>Terminal Adapter Type I Model II; and Read Interrupt and Unit-Expansion Suppression (if required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td>2760 Optical Image Unit Model 1</td>
<td></td>
<td>1200</td>
<td>D3</td>
<td>Terminal Adapter Type III multipoint for multipoint operation</td>
</tr>
<tr>
<td>2840 Display Control Model 1 (point-to-point or multipoint)</td>
<td>3872 Model 1</td>
<td>2400</td>
<td>D4</td>
<td>Terminal Adapter Type III and Modem Clocking multipoint for multipoint operation and New Sync (if required)</td>
</tr>
<tr>
<td>2848 Display Control Models 1, 2 and 3 (point-to-point or multipoint)</td>
<td>3872 Model 1</td>
<td>2400</td>
<td>D4</td>
<td>Terminal Adapter Type III and Modem Clocking multipoint for multipoint operation and New Sync (if required)</td>
</tr>
<tr>
<td>3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (without interrupt feature)</td>
<td></td>
<td>300</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility; and 300 Bits Per Second Line Speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and 300 Bits Per Second Line Speed</td>
</tr>
<tr>
<td>3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Receive Interrupt feature)</td>
<td></td>
<td>300</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility; Write Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Write Interrupt, and 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td>3767 Communications Terminal Model 1 or 2 with (#7113) - 2741 Line Control (with Transmit Interrupt feature)</td>
<td></td>
<td>300</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and Switched Network Facility; Read Interrupt, 300 Bits Per Second Line Speed, and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and Read Interrupt, and 300 Bits Per Second Line Speed and Unit-Exception Suppression (if required)</td>
</tr>
<tr>
<td>3767 Communications Terminal Model 1 or 2 with (#7113) - 2740-1 Line Control</td>
<td></td>
<td>300</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and 300 Bits Per Second Line Speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II; and 300 Bits Per Second Line Speed</td>
</tr>
<tr>
<td>3767 Communications Terminal Model 1 or 2 with (#7112) - 2740-2 Line Control</td>
<td></td>
<td>134.5</td>
<td>C1</td>
<td>Terminal Adapter Type I Model II; and 600 Bits Per Second Line Speed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D1</td>
<td>Terminal Adapter Type I Model II</td>
</tr>
<tr>
<td>System/7</td>
<td></td>
<td>600</td>
<td>D2</td>
<td>Terminal Adapter Type I Model II; and 600 Bits Per Second Line Speed</td>
</tr>
</tbody>
</table>

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### TABLE 2 – Part 1 (cont’d)

<table>
<thead>
<tr>
<th>Line Speed (Bits/Sec)</th>
<th>IBM Modem</th>
<th>Manner of Line Operation</th>
<th>Communication Line and Modem Facilities</th>
<th>Features Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>3872</td>
<td>Point-to-Point</td>
<td>D3 (two-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Half Duplex Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td></td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td></td>
<td>C3</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Switched Network Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>1200</td>
<td>3872</td>
<td>Point-to-Point</td>
<td>D3 (two-wire)</td>
<td>Synchronous Data Adapter Type II, and Half Duplex Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td></td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td></td>
<td>C4</td>
<td>Synchronous Data Adapter Type II, Switched Network Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>2400</td>
<td>3872</td>
<td>Point-to-Point</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Half Duplex Facility, and Switched Network Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Data Code Features, and New Sync (if required)</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>4800</td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D5</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Data Code Features, and New Sync (if required)</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D5</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>4800</td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D5</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Data Code Features, and New Sync (if required)</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D5</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>7200</td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D6 (with C2 conditioning)</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D6 (with C2 conditioning)</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Tributary Station, and Data Code Features</td>
</tr>
</tbody>
</table>

### TABLE 2 – Part 2

### FEATURES REQUIRED FOR BINARY SYNCHRONOUS TERMINALS

<table>
<thead>
<tr>
<th>Line Speed (Bits/Sec)</th>
<th>IBM Modem</th>
<th>Manner of Line Operation</th>
<th>Communication Line and Modem Facilities</th>
<th>Features Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>3872</td>
<td>Point-to-Point</td>
<td>D3 (two-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Half Duplex Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td></td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td></td>
<td>C3</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Switched Network Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D2 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and 600 Bits Per Second, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>1200</td>
<td>3872</td>
<td>Point-to-Point</td>
<td>D3 (two-wire)</td>
<td>Synchronous Data Adapter Type II, and Half Duplex Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td></td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td></td>
<td>C4</td>
<td>Synchronous Data Adapter Type II, Switched Network Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D3 (four-wire)</td>
<td>Synchronous Data Adapter Type II, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>2400</td>
<td>3872</td>
<td>Point-to-Point</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Half Duplex Facility, and Switched Network Facility, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Data Code Features, and New Sync (if required)</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D4</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>4800</td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D5</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Data Code Features, and New Sync (if required)</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D5</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>4800</td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D5</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Data Code Features, and New Sync (if required)</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D5</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Tributary Station, and Data Code Features</td>
</tr>
<tr>
<td>7200</td>
<td>3872</td>
<td>Multipoint – 3138 as Control Station</td>
<td>D6 (with C2 conditioning)</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Data Code Features</td>
</tr>
<tr>
<td></td>
<td>3872</td>
<td>Multipoint – 3138 as Tributary Station</td>
<td>D6 (with C2 conditioning)</td>
<td>Synchronous Data Adapter Type II; and Modem Clocking, and Tributary Station, and Data Code Features</td>
</tr>
</tbody>
</table>

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IBM 3145 PROCESSING UNIT

Purpose: Has program, control and auxiliary storage, plus arithmetic and logic circuits for a S/370 model 145.

Model GE 163,840 bytes of processor storage.
Model GFD 212,992 bytes of processor storage.
Model H 262,144 bytes of processor storage.
Model HG 393,216 bytes of processor storage when used with a 3345 mdl 1 or 4.
Model I 524,288 bytes of processor storage when used with a 3345 mdl 2 or 5.
Model H2 262,144 bytes of processor storage.
Model HG2 393,216 bytes of processor storage.
Model I2 524,288 bytes of processor storage.
Model H2 766,432 bytes of processor storage.
Model J2 1,048,576 bytes of processor storage.
Model J2 1,572,864 bytes of processor storage.
Model K2 2,097,152 bytes of processor storage.

For additional models of the 3135, see 3135-3 in “Machines” pages.

Highlights: Depending upon the processing unit model, up to 2,097,152 bytes of processor storage are available. CPU cycle time of 202-315 nanoseconds depending upon internal operations being performed. Sixteen general purpose and four floating point registers.

Virtual storage capability to increase the effective utilization of main storage.

On the 3145 mdls FED*, GE, GFD, H, HG or I, the 2319 Disk Storage mdl A1 (with 2312, 2313, 2316 or 2319 mdl A2 Disk Storage) can be natively attached via the Integrated File Adapter (#4650). 3330 Disk Storage and Control modules (with 3330 modules) and/or 3340 Disk Storage mdl A2s (with 3340 B mdls and/or 3344s) and/or 3350 Disk Storage mdls A2/A2F (with 3350 B2/B2F, C2/C2F mdls) can be attached to 3145 mdls FED, GE, GFD, H, HG or I via the Integrated Storage Control on 3545 mdls 3, 4 or 5. Attachment of 3330 series, 3340 series and 3344s and/or 3350 series disk storage to 3145 mdls H2, HG2, I2, I2, I2, J2, J2 or K2 is via the Integrated Storage Control (#4660).

In addition to main storage, 32,768 bytes of Reloadable Control Storage are included in the CPU for all storage configurations. This feature permits emulator and control routines to function. Any expansion of control storage beyond 32,768 bytes (up to 65,536 bytes maximum) is provided in 2,048 byte increments at the expense of main memory ... see “Control Storage Requirements” below for basic machine and selected feature requirements in microcode.

An optional Clock Comparator and CPU Timer provides additional timing facilities for the programmer.

Virtual Storage: Extended Control (EC) Mode expands the structure of the Program Status Word to accommodate the control of new S/370 features and extends the number of permanently assigned main storage locations. The S/370 mdl 145 can operate in either EC Mode or Basic Control (BC) Mode as defined for S/360. Dynamic Address Translation (DAT) is a standard feature on the S/370 mdl 145. When the S/370 mdl 145 is in EC Mode, with Translation Mode operable, program addresses are treated as "logical addresses" and the translation feature develops "real addresses." Since logical storage addressing is not limited by the amount of available real storage, program size may exceed real storage size. This logical storage is referred to as "virtual storage" and may be as large as 16,777,216 bytes on the S/370 mdl 145. For I/O operations, Channel Indirect Addressing provides a means to transmit data that spans pages of noncontiguous real storage.

Program Event Recording, a standard feature, is a debugging aid which permits four types of events to be selectively monitored in a virtual environment: [1] Successful branches ... [2] Instruction fetch address compare ... [3] Main Storage alteration address compare ... [4] General Purpose Register alteration address compare...

Standard features include a commercial instruction set, new S/370 instructions, Extended Control (EC) Mode, Dynamic Address Translation, Channel Indirect Data Addressing, Program Event Recording, interval timer, time-of-day clock, store and fetch protect, console file, byte-oriented operand feature, error checking and correction code on main storage, micro-instruction retry, channel multiplexer channel, audible alarm, OS/DOS Compatibility Feature, and one selector channel.

**PREREQUISITES:**

For 3145 mdl HG or I – 3345 Storage and Control Frame and 3046 Power Unit.
For 3145 mdl H2, HG2, I2, I2, J2, J2 or K2 – 3047 Power Unit.

**Control Storage Requirements:** The Reloadable Control Storage is housed in the CPU and is loaded from the Console File, which is located below the console reading board. This area of control storage is not available to the user. Control Storage requirements for the system are as follows:

- **Basic System Microcode** – does not include 16 standard subchannels on the byte multiplexer channel 26,000 bytes
- **Byte Multiplexer Channel UCWs** – select one of the following:
  1. 16 MPX Channel Units 256
  2. 32 MPX Channel Units 512
  3. 64 MPX Channel Units 1024
  4. 128 MPX Channel Units 2048
  5. 256 MPX Channel Units 4096

**Optional System Features**

- Console Printer/Keyboard and Alternate Console Facility (select one of the following):
  1. 3210 Console Printer-Keyboard mdl 1 3200
  2. 3210 Console Printer-Keyboard mdl 1 with remote 3210 mdl 3 3440
  3. 3215 Console Printer-Keyboard 3800
  4. 3215 Console Printer-Keyboard with remote 3210 mdl 3 4570

- Select Channel Block Multiplex Feature (basic microcode which supports any and all selector channels with block multiplex) 2500 bytes

- **UCWs for the Block Multiplexer Channel**

<table>
<thead>
<tr>
<th>Model HG</th>
<th>8 bytes x UCWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 bytes x UCWs</td>
<td>NOTE: 512 UCWs are maximum.</td>
</tr>
</tbody>
</table>

- Integrated File Adapter 9760 bytes
- **Compatibility Support** – select one:
  1. 1401/1440/1460 Compatibility 5200 bytes
  2. 1401/1440/1460/1410/7010 Compatibility 6000 bytes

- **Floating Point**

<table>
<thead>
<tr>
<th>Model HG</th>
<th>6 bytes x UCWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 bytes x UCWs</td>
<td>+bytes</td>
</tr>
</tbody>
</table>

- **Direct Control Feature**

<table>
<thead>
<tr>
<th>Model HG</th>
<th>7 bytes x UCWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 bytes x UCWs</td>
<td>+bytes</td>
</tr>
</tbody>
</table>

- **Clock Comparator and CPU Timer**

<table>
<thead>
<tr>
<th>Model HG</th>
<th>8 bytes x UCWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 bytes x UCWs</td>
<td>+bytes</td>
</tr>
</tbody>
</table>

- **Conditional Swapping**

<table>
<thead>
<tr>
<th>Model HG</th>
<th>14 bytes x UCWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 bytes x UCWs</td>
<td>+bytes</td>
</tr>
</tbody>
</table>

- **Advanced Control Program Support**

<table>
<thead>
<tr>
<th>Model HG</th>
<th>16 bytes x UCWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 bytes x UCWs</td>
<td>+bytes</td>
</tr>
</tbody>
</table>

- **Virtual Machine Assist**

<table>
<thead>
<tr>
<th>Model HG</th>
<th>240 bytes x UCWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>240 bytes x UCWs</td>
<td>+bytes</td>
</tr>
</tbody>
</table>

- **APL Assist**

<table>
<thead>
<tr>
<th>Model HG</th>
<th>1950 bytes x UCWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950 bytes x UCWs</td>
<td>+bytes</td>
</tr>
</tbody>
</table>

Control storage requirements in excess of 32,768 bytes will reduce processor storage by the amount exceeding 32,768 bytes in 2,048-byte increments to a maximum of 65,536 bytes.

**Example:**

<table>
<thead>
<tr>
<th>Model HG</th>
<th>26,000 bytes</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 UCWs on byte multiplexer channel 256 bytes</td>
<td></td>
</tr>
<tr>
<td>3210 Console Printer-Keyboard mdl 1 3,200 bytes</td>
<td></td>
</tr>
<tr>
<td>Integrated File Adapter 9,760 bytes</td>
<td></td>
</tr>
<tr>
<td>1401/1440/1460 Compatibility 5,200 bytes</td>
<td></td>
</tr>
</tbody>
</table>

44,416 bytes

The Movable Control Storage Boundary is set on 2,048 bytes. Control Storage required is 45,056 (32,768 + 6 x 2,048). The impact on processor storage is 12,288 bytes.

The address boundary between control and processor storage is assigned at Initial Micro Program (IMPL) time. The boundary is established by the value loaded (during IMPL) according to the requirements in the console file. The boundary established is the upper limit of main storage addresses. If an I/O operation or program instruction attempts to address a main storage location at or above this boundary, an address check occurs and no storage location is accessed. If a control storage access is attempted below the boundary, a machine check occurs. Control storage will never be less than 32,768 bytes. Above this amount - to a maximum of 65,536 bytes - control storage is allocated from processor storage in 2,048-byte increments depending upon requirements specified to the system. This allocation can be changed by utilizing an alternate magnetic disk cartridge with another set of 3145 features. Alternate cartridges for an installation will be available via RPQ.

For S/360 Programming Systems (DOS and OS), the amount of processor storage available after control storage requirements have been met must be equal to or larger than the S/360 memory.*

* 3145 mdl FED is no longer available.

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size that the version of the operating system requires. Any decre­
ment of processor storage for control storage requirements will be made in increments of 2,048 bytes.

Input/Output Attachment — a wide variety of I/O devices may be
attached to the S/370 mdls 145 via the standard byte multiplexer
channel and the optional selector channels. There are, however,
four direct attachment features for the 3145; they are:

Console File (standard) — this is the basic microprogram loading
device for the system. The console file contains a small, low­
performance read-only file device that provides all of the micro­
code for the system on removable magnetic disk cartridges or
several disks that will be supplied with the system will supply all
of the required microcode for FE diagnostics, basic systems features, plus the optional features ordered for the system.

Console Printer-Keyboard (required) — this unit serves as the on­
line-inlet/output device for operator/system communications.
It provides a means of manually entering data into the system,
altering data already in storage, and for printing error logout
messages.

Integrated File Adapter (optional on 3145 mdls FED, GE, GFD,
H, HG or if ... not available on mdls H2, HG2, I2, HJ2, J2 or
J2) — this feature enables native attachment of 2319 Disk Stor­
age mdl A1 (and additional 2312, 2313, 2316* or 2319 mdl
A2* Disk Stores) through an integrated adapter. The adapter is
permanent assigned to the standard selector channel
(Channel 1), and requires space normally assigned to Selector
Channel 4. When the IFA is installed, Selector Channel 2 be­
comes standard, and only Selector Channel 3 can be ordered.

Integrated Storage Channels (optional on models FED, GE, H2,
J2, J2 or K2) — not available on mdls FED, GE, H, HG or if —
this feature allows native attachment of 3333 Disk Storage and
Control Channel 2 (with 3330 models) and/or 3340 Disk Stor­
age mdl A2s (with 3340 B2 models and/or 3344A or 3350 Disk
Storage mdls A2/A2F (with 3350 B2/B2F, C2/C2F mdls). This
feature requires an available control unit position on a system
channel. A Block Multiplexer Channel and one unshared sub­
channel per logical device are required for support of block
multiplexing and rotational position sensing. If this support is
not required, attachment to a system selector channel is permitted.

This attachment capability is provided for the 3145 mdls FED,
GE, GFD, H, HG or if or the 3345 mdls 3, 4 and 5 ... see 3345.

Input/Output Channels

Byte Multiplexer Channel — one is standard on the 3145 and is
functionally equivalent to the byte multiplexer channel on the S/
360 mdls 30, 40 and 50. Sixteen subchannels are provided as
standard with the option of 32, 64, 128 or 256 ... see "Special Features." At system order time, the number of units on the
multiplexer channel must be specified in order that the total
amount of control storage is reserved. The byte multiplexer chan­
nel provides eight control unit positions and permits several I/O
operations simultaneously with computing. In burst mode, the
channel handles one high speed unit. For Operating System/360
exclusive, refer to SRL GC26-6554, System/360 Operating
Systems System Generation.

Selector Channels — one is standard and three additional are
available ... see "Special Features." NOTE: If the Integrated File
Adapter is specified, see Selector Channel under "Special Features" for limitations. With the optional Word Buffer installed, the
selector channel data rate will approximate 1.85 megabytes/second, while unbuffered, the data rate will be 820KB. The Block Multiplexer Channel is also available for the
selector channels and the channel data rates apply with or with­
out the feature. On channels without the Word Buffer (#8810),
the 3330/3330 or 3345 mdl 3, 4, 5 with 3330 drives must be attached to channel 1 of non-IFA systems and to channel
2 on IFA systems. On channels with #8810, the 2305/2835 mdl 2
must be attached to channel 1 on non-IFA systems and to chan­
el 2 on IFA systems, and the 3330/3330 or 3345 mdl 3, 4, 5
may be attached to any available channel. NOTE: If block multi­
plexing or rotational position sensing is required, the Block Multi­
plexer Channel feature must be installed. The Word Buffer
(#8810) is required to attach the 2305/2835 mdl 2 or 3340. If the
S/370 mdls 145 has 3 or 4 selector channels (IFD controller
counts as a selector channel), the Word Buffer (#8810) is required
to attach a 3330 series facility.

Console Function — a standard system control panel is located on
the 3145. It has switches and lights necessary to operate and
control the system. A systems control I/O function is provided with
either of two alternatives. Feature #7844 attaches the 3210 Con­
sole Printer-Keyboard mdl 1 (15.6 cpa) on the console tele­
ing board. Optionally, the 3215 Console Printer-Keyboard (85 cpa)
can be attached via feature #7855. Either #7844 or #7855 is
required in the system. A remodeled 3210 mdl 2 may also be at­
tached ... see "Special Features."
IBM

DP Machines

3145 Processing Unit (cont'd)

From To H2 HG2 I2 H1 J2 J12 K2
GE $79,280 $138,150 $182,800 $272,100 $361,400 RPQ RPQ
GFD 47,180 106,050 150,700 240,000 329,300 RPQ RPQ RPQ
H 15,050 73,950 118,600 207,900 297,200 RPQ RPQ RPQ RPQ
HG RPQ RPQ RPQ 120,000 209,350 298,650 RPQ RPQ
I RPQ 209,350 298,650 RPQ RPQ RPQ RPQ
H2 58,850 103,950 152,800 232,100 240,600 476,900 655,500 RPQ RPQ RPQ RPQ
HG2 44,650 133,250 233,250 318,000 398,650 596,650 RPQ RPQ RPQ RPQ
J2 89,300 178,600 373,400 532,000 RPQ RPQ RPQ RPQ
JH2 89,300 240,800 462,700 RPQ RPQ RPQ RPQ
J12 194,800 178,600
J12 178,600

Customer price quotations and customer order acknowledgement letters for purchase must state: 'Installation of model changes to the '2' series from the non '2' series channel by performing operations on other devices while the above) and or VTAM and for TCAM/NCP. Limitation: Cannot be included if Conditional Swapping (#1051) is installed. Field Installation: Yes.

ADVANCED CONTROL PROGRAM SUPPORT (#1001). Provides four additional instructions and a new function. ... and Compare Swap ... Compare Double and Swap. Insert PSW Key ... Set PSW Key ... Clear I/D Function. This feature is a prerequisite for the execution of MVS (OS/VS2 Release 2 up and above) and VTAM and for TCAM/NCP. Limitation: Cannot be included if Advanced Control Program Support (#1001) is installed. Field Installation: Yes.

AJP ASSIST (#1005). Provides performance assist to AJP programs when used with the VS APL PP #5748 AP1. Field Installation: Yes.

CONDITIONAL SWAPPING (#1051). Provides two additional instructions ... Compare and Swap ... Compare Double and Swap. This feature is a prerequisite for the execution of VTAM programming support and for TCAM/NCP. Limitation: Cannot be included if Advanced Control Program Support (#1001) is installed. Field Installation: Yes.

BLOCK MULTIPLEXER CHANNEL (#1421). Increases the efficiency of the selector channel when using direct access storage devices equipped with rotational position sensing. The disconnect­ ed command chancing feature of the channel allows multiple devices to perform non-data transfer operation concurrently with one data transfer operation. This permits increased utilization of the channel by performing operations on other devices while the channel would have normally been waiting on one device. This feature provides Block Multiplexer capabilities for all system selector Channels. Field Installation: Yes. Specify: The number of UCWs (available in multiples of 16) for Block Multiplexer Channels must be specified. Select one of the following numbers, which will supply the specified number of UCWs to be shared by the Block Multiplexer Channel(s). Field Installable: Yes.

Code UCWs Code UCWs Code UCWs Code UCWs
#9497 16 #9498 14 #9507 160 #9509 272 #9515 400
#9492 32 #9509 160 #9509 288 288 288 288 288
#9493 48 #9509 176 #9509 304 304 304 304 304 304
#9494 64 #9509 192 #9509 320 320 320 320 320 320
#9495 80 #9509 208 #9511 336 336 336 336 336 336
#9496 96 #9509 224 #9512 352 352 352 352 352 352
#9497 128 #9509 256 #9514 384 384 384 384 384 384
#9521 256 #9522 512

Note: The number of UCWs specified for the Block Multiplexer Channel(s) does NOT affect the number of Multiplexer Sub-channels. See Multiplexer Subchannels, Add'l (#4951 - 4954).

CHANNEL-TO-CHANNEL ADAPTER (#1650). To interconnect two channels (either S/360, S/370 or 4341 Processor). Only one of the processors requires this feature. Uses two control unit positions on each of the connected channels. Maximum: One. Field Installation: Yes.

CLOCK COMPARATOR AND CPU TIMER (#2001). The Clock Comparator provides a means of causing an interruption when the time-of-day clock has passed a program-specified value. The CPU Timer is a decrementing binary counter with a resolution of one microsecond. It provides a means for measuring elapsed CPU time by causing an interruption when the pre-specified amount of time has elapsed. Maximum: One. Field Installation: Yes.

CONTROL STORE EXTENSION (#2150). [Mdl's H2, HG2, I2, IH2, J2, J12, K2 only] Provides additional control store for micro­program use on the ISC (#4660) ... see 'Specify' under Integrated Storage Control (#4660) to determine when required. Limitation: Cannot be installed with Control Store Extension (#2150). Maximum: One. Field Installation: Yes.

DIRECT CONTROL (#3274). Provides two instructions, Read Direct and Write Direct and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. Maximum: One.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single emergency power-off switch in a "room" or "area" ... see Emergency Power-Off Control under S/370mdl 145 in "System." (#3621) ... to interconnect two emergency power-off switches ... (#3622) ... to interconnect up to twelve emergency power-off switches.


1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with special software, permits the system to execute 1401/1440/1460 instructions. Field Installation: Yes.


INTEGRATED FILE ADAPTER (#4650). [Mdl's FED, GE, GHD, HG, I only] Permits native attachment of the 2319 Disk Storage ... to eight drives total) through an integrated adapter. Standard features include file scan and record overflow functions. Specify: One of the following additional power features -- #8303 for three drives ... #9304 for four ... #9305 for five ... #9306 for six ... #9307 for seven ... #9308 for eight. See 2319 for additional ordering instructions. Limitation: Cannot be installed on mdls H2, HG3, I2, IH2, J2, J12 or K2. Field Installation: Not recommended ... but may be removed in the field.

INTEGRATED STORAGE CONTROL (#4660). [Mdl's H2, HG2, I2, J2, J12, K2 only] Provides for the attachment of 3333s (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs ... see DASD Configuration under Specify, below. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344s to the 3340 mdl A2 or by attaching 3350 mdl Bs and/or a mdl C to the 3350 mdl A2 or A2F ... see DASD Configuration table below and 3330, 3333, 3340, 3344, 3350 "Machines" pages. Maximum: One. Field Installation: Yes. Specify: Can be installed on mdls FED, GE, GHD, HG or I Prerequisites: Requires a control unit position on a system channel. A block multiplexer channel and one unshared sub-channel per logical device is required for both the block multiplexing and rotational position sensing. If this support is not required, attachment to a system selector channel is permitted. Word Buffer (#8810) is required to support the 3340, or if the system includes Selector Channel, 3rd (#9383). Specify: The available combinations of storage devices which can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Features" are installed. Based on the DASD, and the Special Features listed below being ordered for them, order the Required DASD Specify Feature(s). [Note that #9180 is 3340 Fixed Head Attachment for #9314 and #9315 and is not specified for #9317 or #9318.]

J2, J12, K2 only) Provides additional control storage for micro­program use on the ISC (#4660) ... see 'Specify' under Integrated Storage Control (#4660) to determine when required. Limitation: Cannot be installed with Control Store Extension (#2150). Maximum: One. Field Installation: Yes.


d CPU diskette-only specify feature. No fee when ordered at time of manufacture or with expansion to an existing diskette. $480 on purchased machines to include any number of diskette-only changes ordered on same diskette.

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<table>
<thead>
<tr>
<th>DASD Configuration</th>
<th>Required DASD Specify Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>One or two 3333s with associated 3330s</td>
<td>X</td>
</tr>
<tr>
<td>Up to four 3333s with associated 3330s</td>
<td>X</td>
</tr>
<tr>
<td>String Switch (8150) on any 3330</td>
<td>X</td>
</tr>
<tr>
<td>One or two 3340s with associated 8132</td>
<td>X</td>
</tr>
<tr>
<td>Up to four 3340s with associated 8132</td>
<td>X</td>
</tr>
<tr>
<td>String Switch (8150) on any 3340</td>
<td>X</td>
</tr>
<tr>
<td>Fixed Head Feature (4301/4302) on any 3340</td>
<td>X</td>
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</tbody>
</table>

**Notes:**
- ISC, diskette-only specify feature. No fee when ordered at time of manufacture.
- Any change to an installed DASD configuration requires an MES for the new configuration that indicates a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed and removal of any not listed as required for the new configuration.
- Control Store Extension is prerequisite. With #9315, the ISC requires 32 contiguous device addresses regardless of the number of drives attached.
- Control Store Extension and Register Expansion are prerequisites. For configurations in this group the ISC uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 m2 As on the first and third strings may attach up to three 3340 m2 B1, B2, and/or 3344 in any combination. The 3340 m2 A2 on the second string may attach up to three 3340 m2 B1/B2. The 3340 m2 A2 on the fourth string may attach one 3340 m2 B1 or B2.

**TWO CHANNEL SWITCH (#8100).** [Mds H2, HG2, J2, JH2, J2, K2 only] To attach the Integrated Storage Control (#4660) to a second channel ... the two channels are not connected CH 3 and CH 4. Switching is under program control. The ISC feature in the 3145 can be dedicated to a single channel by means of a single/Double switch. Limitation: Cannot be installed on a m1 FED, GE, GFD, H, HG or I. Maximum: One. Field Installation: Yes. Prerequisite: See "Prerequisites" under ISC (#4660).

VIRTUAL MACHINE ASSIST (#8740). Provides assist to VS systems operating under VM/370 by utilization of certain privileged operations. Field Installation: Yes. Prerequisite: Clock Comparator and CPU Timer (#2001) and Floating Point (8730).

WORD BUFFER (#8810). Increases the data rate capability of the selector channels on the 3145 from a maximum aggregate data rate of 1.55 megabits per second to 5.3 megabits, and the maximum single channel rate from 0.85 megabits to 1.85 megabits. When installed, applies to all selector channels. Field Installation: Yes. Prerequisite: This feature is required to operate 3350 or 3350 series drives when the system configuration includes an Integrated File Adapter and two Selector Channels, or three or more Selector Channels. It is also required whenever 3340, 3344 or 3350 series drives are attached.
<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/ MRC</th>
<th>TLP</th>
<th>MLC</th>
<th>Purch</th>
<th>MMIC</th>
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<td>for all Selector Channels</td>
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<tr>
<td>Channel-to-channel Adapter</td>
<td>1850</td>
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<td>$297</td>
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<td>Clock Compte &amp; CPU Timer</td>
<td>2001*</td>
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<td>for 2 switches</td>
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† MAC/MRC, TLP/MLC prices effective June 1, 1979.
* Feature supplies CPU diskette.
** Feature supplies ISC diskette.
*** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. $405 on purchased machines when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.

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IBM 3145-3 PROCESSING UNIT


Model Processor Storage
A1* 196,608 Bytes of Processor Storage
A2* 327,680 Bytes of Processor Storage
A3* 456,752 Bytes of Processor Storage
A4* 720,896 Bytes of Processor Storage
A5* 963,040 Bytes of Processor Storage
A6* 1,507,328 Bytes of Processor Storage
A7* 2,031,616 Bytes of Processor Storage

NOTE 1: The 3145-3 is available as a non-removable, field installable upgrade to a S/370 mdl 145 models H2, H2G, I2, I2H, J2, J26 and K2.

NOTE 2: Up to 64K of main memory is removed during the conversion to a 3145-3 resulting in the memory sizes as specified.

* A complete systems assurance review/approval at the branch office level is required before ordering.

Highlights: Depending on the model, up to 2,031,616 bytes of processor storage are available. CPU cycle time varies from 180 to 270 nanoseconds depending upon the internal operation being performed. Sixteen general purpose and four floating point registers are provided.

Standard Features Include: Advanced Control Program Support ... Virtual Storage: Virtual Storage Error Checking and Correction (in Main and Control Storage) ... Program Event Recording ... System

Features.

Basic Features:

- Console Printer-Keyboard (required) -- the unit serves as the online input/output device for operator/system communications. It provides a means of manually entering data into the system, allowing data already in storage, and for printing error logout messages.
- Integrated Storage Control -- this feature allows native attachment of 3333 Disk Storage and Control modules (with 3330 models) and/or 3340 Disk Storage mdl A2s (with 3340 B models and/or 3344E) and/or 3350 Disk Storage mdls A2/A2F (with 3350 B2/B2F, C2/C2F mdls). This feature requires an available control unit position on a system channel.

Programming Features:

- Advanced Control Program Support (standard) -- provides four additional instructions and an additional function ... Configure and Swap ... Compare and Double and Swap ... Insert PSW Key ... Set PSW Key from Address ... Clear I/O Function.
- APL Assist (standard) -- this is an APL emulator. It replaces functions performed by a true APL software interpreter. This feature can provide a performance improvement for many APL applications when used with VS APL PP #5745 AP1.
- Extended Control Program Support (standard) -- the 3145-3 processor models of the S/370 mdl 145 include Extended Control-Program Support. This is a hardware assist that reduces the CPU time needed to execute certain frequently used supervisory functions in both VS-1 and VS-2.

The functional areas for VM/370 include:
- Virtual Machine I/O
- Storage Management
- Page Management
- SVC Handler
- Privileged Instruction Interfaces
- Dispatching
- Virtual Interval Timer

For VS-1 the functional areas are:
- Storage Management
- IOD
- SVC FLII
- System Trace
- Page Management

PREREQUISITES: The following prerequisites apply to each 3145-3 processor model.

1. 3047 Power Unit ... see 3047.
2. Clock Comparators and CPU Timer Feature (#2001) ... see 3145 Processing Unit (Special Features).
3. Word Buffer Feature (#8810) ... see 3145 Processing Unit (Special Features).

Bibliography: GC20-0001

Specify:
1. Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, #9035 for 230 V, or #9005 for 250 V.
2. Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
3. Console Table (Reading Board) Extension: #9824 for extension to operator’s right, or #9825 for extension to left.
4. Cabling: #9090 for below the floor, or #9091 for on the floor.
5. Additional Multiplexer Subchannels: 64 are standard ... if more are required, see “Special Features.”
6. Emergency Power-Off Control: May be required ... see “Special Features” and S/370 Manual, Installation Information Physical Planning, for requirements.
8. RETAIN/370: #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, or #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to the telephone line.

NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.

9. Shipping Instructions: Unless otherwise specified, shipping dimensions of the 3145 Frame 01 (CPU) are 31-1/2” wide x 70” long x 60” high. Removal of the side covers will reduce the width to 29-1/2”. If further reduction in length is required.

Not to be reproduced without written permission.
3145-3 Processing Unit (cont’d)
specify #9626. Shimming dimensions will then be 29-1/2” wide 
ox 60” long x 60” high.
[10] Console Printer-Keyboard Address: Recorded on the console 
file disk at the plant. *9101F* for “01F”, or *9102F* for “00F”.
[11] Alternate Console Printer-Keyboard Address: *9105$ ... 
alternate address of “00F” for the Second Console Printer-
Keyboard (3210) md1 303. Address is in lieu of the standard 
Alternate Console Printer-Keyboard address of “01E” when 
the Primary Printer-Keyboard is “01E” Recorded on the console 
file disk at the plant. PRECURRISE: *9101, Primary 
Console Printer-Keyboard Address “01F”.

### TLP

**MAC/ MLC**

**A2**

**MRC**

**Purchase**

**MMMC**

<table>
<thead>
<tr>
<th>Prices: Mdl</th>
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<tr>
<td>A7</td>
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</table>

### Plan Offering: Plan A, Additional Use Charge Rate: 10%

### Metering: Base Unit

### Maintenance: A

### Per Call: 3

### Purchase Option: 45% *** Warranty: A

### Useful Life Category: 2

### Termination Charge Percent: 25%

### Upper Limit Percent: 5%

### Model/Feature Additional Charge in lieu of AU Charge: 15%

**Prices shown do not include charges for any 3145-3 prerequisite features.**

### SPECIAL FEATURES

**BLOCK MULTIPLEXER CHANNEL (###1427-1429).** Each adds a high-speed channel to the system. The channel permits overlapped I/O operation with processing. Eight control unit positions are provided on each channel. #1427 – for second channel ... #1428 – for third ... #1429 – for fourth. Field Installation: Yes. Prerequisites: #1427 requires #1427 ... #1429 requires #1429.

**BLOCK MULTIPLEXER SUBCHANNELS, ADDITIONAL (###1450).** To increase the number of I/O devices on the block multiplexer channels, the number of subchannels can be increased by specifying one of the following: #9582 for 128 ... #9582 for 256 ... #9583$ for 512. The number of subchannels selected will be shared by the Block Multiplexer Channels(s) attached to the system.

**INTEGRATED STORAGE CONTROL (###4660).** Provides for the attachment of 3333a (md1 1 and/or 11) and/or 3340 md1 A2s and/or 3350 md1 A2s/A2Fs ... see DASD Configuration under Specify. Additional storage is provided by attaching 3333 modules to the 3333 or by attaching 3340 md1 B8 and/or 3344s to the 3340 md1 A2 or by attaching 3350 md1 B8 and/or a md1 C to the 3350 md1 A2. DASD configuration tables under Specify and 3330, 3333, 3340, 3344, 3350 "Machines" pages.

### IBM diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $250 on purchased machines to include any number of diskette-only changes ordered on same diskette.

### Any change to an installed DASD Configuration requires an M3S ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The M3S must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.

### Control Store Extension (#2150) is prerequisite. With #9315, the ISC requires 32 contiguous device addresses regardless of the number of drives attached.

### Expanded Control Store (#2152) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 md1 A2s on the first and third strings may attach up to three 3340 md1 B1, B2, and/or 3344s in any combination. The 3340 md1 A2 on the second string may attach up to three 3340 md1 B1/B2. The 3340 md1 A2 on the fourth string may attach one 3340 md1 B1 or B2.

### Expanded Control Store (#2152) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 8 or 16 or 32 or 64 device addresses depending upon the DASD configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

---

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3145-3 Processing Unit (cont'd)

NOTE: Customers who may elect to purchase Control Store Extension (#2150) and later upgrade to Expanded Control Store should consider the purchase of Expanded Control Store (#2152) initially because this field upgrade requires replacement of Control Store Extension (#2150) and installation of Expanded Control Store (#2152). The prerequisite of Control Store Extension (#2150) for #9315 or #9317 can be satisfied by Expanded Control Store (#2152).

MULTIPLEXER SUBCHANNELS, ADDITIONAL. (#4953, 4954).

To increase the number of I/O devices on the byte multiplexer channel, the number of subchannels beyond the two specified here may be increased by specifying one of: #4953 for 128 or #4954 for 256. The maximum number of shared subchannels is eight. When 256 multiplexer subchannels are installed there are NO shared subchannels. Note: The number of Multiplexer Subchannels does not affect the number of UWCs specified for the Block Multiplexer Channels. Subchannels in Block Multiplexer Subchannels, Additional (#1450) specify. Field Installation: Yes.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (S/360, S/370, or 4341 Processor). Only one of the processors requires this feature. Uses two control unit positions on each of the connected channels. Maximum: One. Field Installation: Yes.


CONTROL STORE EXTENSION (#2150). Provides additional control store for microprogram use on the ISC (#4660) ... see "Specify" under Integrated Storage Control (#4660) to determine when required. Limitation: Cannot be installed with Expanded Control Store (#2152).

EXPANDED CONTROL STORE (#2152). Provides additional control store for microprogram use on the ISC (#4660). ... see "Specify" under Integrated Storage Control (#4660) to determine when required. Limitation: Cannot be installed with Control Store Extension (#2150). One. Field Installation: Yes.

DIRECT CONTROL (#327). Provides two instructions, Read Direct and Write Direct and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. Maximum: One. Field Installation: Required. Field Installation: Yes. Prerequisites: External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - OEM SRL G22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3822). To provide, in effect, a single emergency power-off switch in a "room" or "area" ... see Emergency Power-Off Control under S/370 mdll 145 in "Systems." #3621 to interconnect two emergency power-off switches ... #3822 - to interconnect up to twelve emergency power-off switches.

1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with special software, permits the system to execute 1401/1440/1460 instructions. Field Installation: Yes.


REGISTER EXPANSION (#611). Provides additional registers for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (#4660) to determine when required. Field Installation: Yes. Maximum: One.

3210 MDL 1 ADAPTER (#7844). To attach a 3210 Console Printer-Keyboard mdll 1 (15.5 cps) for system console I/O ... includes an alter-display ability. Position of the 3210 to the right or left of the operator depends upon Console Table Extension (#8824 or #9825) ... see "Specify" above. Limitation: Cannot be installed with 3210 Mdl 1 Adapter (#7844). Maximum: One. Field Installation: Yes. Prerequisites: See "Specify" under Alternate Console Printer-Keyboard is "O1" if the Primary Console Printer-Keyboard is "O1." If the Primary Console Printer-Keyboard is "O2," the standard address for the Alternate Console Printer-Keyboard is "O2." Also see "Specify" for alternate address.

3215 ADAPTER (#7855). To attach a 3215 Console Printer-Keyboard (85 cps) for systems console I/O ... includes alter-display ability. Position of the 3215 to the right or left of the operator depends upon Console Table Extension (#9824 or #9825) ... see "Specify" above. Limitation: Cannot be installed with 3210 Mdl 1 Adapter (#7844). Maximum: One. Field Installation: Yes. Prerequisites: See "Prerequisites" under ISC (#4660).


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<tr>
<th>TLP</th>
<th>MAC/MRC</th>
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<tr>
<td>Multiplexer Subchannels, Addl</td>
<td>128 subchannels</td>
<td>4953</td>
<td>NC</td>
<td>NC</td>
<td>***</td>
</tr>
<tr>
<td>256 subchannels</td>
<td>4954</td>
<td>NC</td>
<td>NC</td>
<td>***</td>
<td>NC</td>
</tr>
<tr>
<td>Register Expansion</td>
<td>6111</td>
<td>24</td>
<td>22</td>
<td>662</td>
<td>4.00</td>
</tr>
<tr>
<td>3210 Model 1 Adapter</td>
<td>7844</td>
<td>153</td>
<td>140</td>
<td>7,410</td>
<td>4.00</td>
</tr>
<tr>
<td>3210 Model 2 Adapter</td>
<td>7845</td>
<td>123</td>
<td>112</td>
<td>5,925</td>
<td>6.50</td>
</tr>
<tr>
<td>3215 Adapter</td>
<td>7855</td>
<td>215</td>
<td>196</td>
<td>10,390</td>
<td>6.50</td>
</tr>
<tr>
<td>Two Channel Switch</td>
<td>8100</td>
<td>205+</td>
<td>186+</td>
<td>7,075</td>
<td>10.00</td>
</tr>
<tr>
<td>Word Buffer</td>
<td>8810</td>
<td>247</td>
<td>225</td>
<td>11,780</td>
<td>6.50</td>
</tr>
</tbody>
</table>

+ MAC/MRC and TLP/MLC prices effective June 1, 1979.  
† 3145-3 prerequisite feature ... see M 3145 pages (special features) for details.  
* Feature supplies CPU diskette.  
** Feature supplies ISC diskette.  
*** CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. $405 on purchased machines when combined with changes subject to a distribution fee to include any number of diskette-only changes ordered on the same diskette.
1,048,576 bytes of Processor Storage
K 2,097,152 Bytes of Processor Storage

Virtual Storage:

Virtual Storage capability is provided to increase the effective utilization of main storage.

Control Storage: 151,072 bytes of Re-loadable Control Storage are provided in addition to main storage. This permits emulator and control routines to function. The Re-loadable Control Storage is housed in the CPU and is loaded from the Console File. Re-loadable Control Storage is not available to the user.

Virtual Storage: Virtual Storage capability is provided to increase the effective utilization of main storage.

Console File (Standard): This is the basic microprogram loading device for the system. The console file contains a small file device that provides all of the microcode for the system on removable magnetic disks. The several disks that will be supplied with the system will supply all of the required microcode for FE diagnostics, basic systems features, plus the optional features ordered for the system.

Console Function: A display console is standard ... includes a cathode ray tube, and a keyboard ... functions as an operator's I/O console to communicate with the operating system ... standard attachment for an optional 3268 Printer mdl 2 or 3287 Printer mdl 1 or 2 for hard copy output. CRT can accommodate twenty-four 80-character lines of information. A system control panel is also located on the 3148 for additional operator communications with the system.

Three console modes are available - "Printer-Keyboard Mode", "Display-Keyboard Mode", and "115/125 Console-Display-Emulatation Mode".

In "Printer-Keyboard mode", the display console uses the keyboard for input and the CRT and a recommended 3268 Printer mdl 2 or 3287 Printer mdl 1 or 2 for output. The CRT, keyboard and printer appear as a single unit on a block multiplexer channel. "Printer-Keyboard" mode is supported by DOS, DOS/VS, OS/360, OS/VS and VM/370.

In "Display" mode, the keyboard is used for input, the CRT with 24 lines by 80 characters/line for output, and DISCS or equivalent support is required. DOS/VS does not support Display Mode. The 3268 Printer mdl 2 or 3287 Printer mdl 1 or 2 optionally has a separate address and requires MGS support or equivalent. When present, the printer appears to the system as a 3215 Printer.

In "115/125 Console-Display-Emulatation" mode, the keyboard is used for input, the CRT is used for output, and the CRT displays twenty-four 80-character lines of information. The 3268 Printer mdl 1 or 2 is optional. When present, the printer emulates a 5213 Printer mdl 1 and acts as a slave unit to the display console. The 3268 Printer mdl 1 or 2 is not addressable in this mode. The "115/125 Console-Display-Emulatation mode is available in DOS/VS Rel. 28 and above.

The display console provides the capability to select three aspects of the system's environment at IPL time:

- Console Mode - see above (Mode descriptions)
- CPU Mode (3148 or 3145) - see Programming Features
- Unit address of native attached I/O (except for those attached to the Integrated Storage Control)

These selections will be recorded on the console file for permanent reuse until such time as any new selection is made during a subsequent IPL. NOTE: This is the only user access to the console file.

Input/Output Files:

- Byte Multiplexer Channel - one is standard ... functionally equivalent to the byte multiplexer channel on the S/370 mdls 148 ... provides eight control unit positions ... byte mode, permits simultaneous operation of many low-speed devices ... in burst mode, handles one high-speed unit.
- Block Multiplexer Channels - four are standard ... each contains the Word Buffer ... as described, each Block Multiplexer Channel approximates 1.85 megabytes/second ... ability to "Block Multiplex" provides greater channel efficiency when using direct access storage devices equipped with rotational position sensing ... devices on these channels which cannot use block multiplexing will function as if attached to selector channels.
- Subchannels - on the byte multiplexer channel, 64 subchannels are provided. Subchannels are provided as standard with the option of 128 or 256 (see "Special Features")... for the four block multiplexer channels 64 block multiplexer subchannels (UCWs) are provided as standard with the option of 128, 256 or 512 (see "Special Features") ... the number of block multiplexer subchannels (UCWs) chosen will be shared by the number of Block Multiplexer Channel(s) attached to the system.

Input/Output Attachment

Non-Native - a wide variety of I/O devices may be attached to the S/370 mdls 148 or 3287 Printer mdls 1 or 2 for hard copy output. CRT can accommodate twenty-four 80-character lines of information. A system control panel is also located on the 3148 for additional operator communications with the system.

Integrated 3203-4 Printer Attachment, First Printer (optional) - provides the capability to natively attach the 3203 Printer mdl 4 as the first systems printer.

Integrated 3203-4 Printer Attachment, Second Printer (optional) - provides the capability to natively attach the 3203 Printer mdl 4 as the second systems printer.

Integrated Console Printer Adapter (standard) - provides the capability to natively attach the optional 3266 Printer mdl 2 or 3287 Printer mdl 1 or 2 as a hard copy printer.

Integrated Storage Control (optional) - allows native attachment of 3333 Disk Storage and Control modules (with 3330 modules) and/or 3400 Disk Storage mdls A2, B2, C2, D2, E2 or F2 (and/or 3344s) and/or 3350 Disk Storage mdls A2/B2F, C2/C2F mdls) ... requires an available control unit position on a block multiplexer channel, so block multiplexing and rotational position sensing require one unshared subchannel on the block multiplexer channel per logical device.

Programming Features:

Advanced Control Program Support (standard) - provides four additional instructions and an additional function ... Compare and Swap ... Compare Double and Swap ... Insert PSW Key ... Set PSW Key from Address ... Clear I/O Function.

APL Assist (standard) - this is an APL emulator. It ... emulates functions performed by the APL software interpreter. This feature can provide a performance improvement for many APL applications when used with VPS APL PP #5748 AP1.

IMPL 3145 CPU Mode Selection - provides the capability to "run" on an S/370 mdl 148 any SCP which will "run" today on an S/370 mdl 145. No performance degradation or loss of S/370 mdl 145 recovery from error capabilities will be experienced in this mode. That is, in 3145 CPU Mode, the improved hardware performance of the S/370 mdl 148 will be available to the user. Moreover, the user will have the same recovery capabilities on the S/370 mdl 148 as he has on a S/370 mdl 145 when 3145 CPU Mode is selected. NOTE: S/370 mdl 148 Integrated Logout/EREP is not supported in this mode.

Extended Control-Program Support (standard) - the S/370 mdl 148 includes Extended Control-Program Support. This is a hardware assist that reduces the CPU time needed to execute certain frequently used supervisor functions in both VS-1 and VM/370.

The functional areas for VM/370 include:

- Virtual Machine I/O
- Storage Management
- Page Management
- SVC Handler
- Privileged Instruction Interfaces
- Dispatching
- Virtual Interval Timer

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Eliminating the number of I/O devices on the block multiplexer channels, the number of subchannels (UCW's) can be increased by specifying one of the following: #9585 # for 256 #9586 # for 256 #9587 # for 512. The number of subchannels selected will be shared by the Block Multiplexer Channel(s) attached to the system. Field Installation: Yes.

PORT-TO-PORT ADAPTER (#1850). To interconnect two channels (either S/360, S/370, or 841 Processor). Only one of the processors requires this feature. Uses two control unit positions on each of the connected channels. Maximum: One. Field Installation: Yes.

CONTROL STORE EXTENSION (#2150). Provides additional control storage for microprogram use on the ISC (#4660) to determine when required. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with Expanded Control Store (#2152).

EXPANDED CONTROL STORE (#2152). Provides additional control storage for microprogram use on the ISC (#4660) to determine when required. Limitation: Cannot be installed with Control Store Extension (#2150). Maximum: One. Field Installation: Yes.

DIRECT CONTROL (#3274). Provides two instructions, Read and Write Direct and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes between two cable-connected processing units, or a cable-connected processing unit and external devices. Maximum: One. Cable Order: Required. Field Installation: Yes. Prerequisite: External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - OEM, SRL GA22-6845.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single emergency power-off switch in a "room" or "area"... see Emergency Power-Off Control under S/370 mdl 148 in "Systems." Field Installation: Yes.

#3621 - to interconnect two emergency power-off switches...

#3622 - to interconnect up to twelve emergency power-off switches.

1401/1440/1460 COMPATIBILITY (#4457). Microprogram controlled feature which, in combination with special software, permits the system to execute 1401/1440/1460 instructions. Field Installation: Yes.


INTEGRATED STORAGE CONTROL (#4660). Provides for the attachment of 3333's (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdls A2s/A2Fs ... see DASD Configuration under Specify, below. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl Bs and/or 3344a to the 3340 mdl A2 or by attaching 3350 mdl Bs and/or a mdl C to the 3350 mdl A2 or A2Fs ... see DASD Configuration table below and 3330, 3333, 3340, 3344, 3350 "Machines" pages. Maximum: One. Field Installation: Yes. Prerequisite: Requires a control unit position on a block multiplexer channel. Block Multiplexing and rotational position sensing require one unshared subchannel on the block multiplexer channel per logical device. Specify: The available combinations of storage devices which can be attached are shown in the table below. Two, three or three in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required Specify Features" are installed. Based on the DASD, and the special features listed below being ordered for them, order the required DASD Specify Feature(s). [Note that #9190 is 3340 Fixed Head Attachment for #9314 and #9335 and is not specified for #9317 or #9318.]
**DIGITAL PROCESSING UNIT (cont'd)**

**3148 PROCESSING UNIT**

**ISC (#4660) WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#8100)**

<table>
<thead>
<tr>
<th>DASD Configuration</th>
<th>Required DASD Specify Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>3333 Only</td>
<td></td>
</tr>
<tr>
<td>One or two 3333s with associated 3333s</td>
<td>x</td>
</tr>
<tr>
<td>Up to four 3333s with associated 3333s</td>
<td>x</td>
</tr>
</tbody>
</table>

**DASD Configuration**

<table>
<thead>
<tr>
<th>3333 Only</th>
<th>3340 Only</th>
<th>3340 Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>One or two 3340s with associated 3340s</td>
<td>Fixed Head Feature (4201) on any 3340s</td>
<td>x</td>
</tr>
<tr>
<td>String Switch (8100) on any 3340s</td>
<td>Fixed Head Feature (4301) on any 3340s</td>
<td>x</td>
</tr>
</tbody>
</table>

**NOTE:**

- ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.
- Any change to an installed DASD Configuration requires a MESS ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MESS must include addition of any new Specify and/or Special Features not previously installed QUESTION/INSTALLATION.
- **Control Store Extension (#2150) is prerequisite. With #9315, the ISC requires 32 contiguous device addresses regardless of the number of drives attached.**
- **Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 and A2s on the first and third strings may attach up to three 3340 mdd B1s, B2s and/or 3346 in any combination. The 3340 mdd A2 on the second channel may attach up to three 3340 mdd B1/B2. The 3340 mdd A2 on the fourth string may attach up to three 3340 mdd B1 or B2.**
- **Expanded Control Store (#2152) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 8 or 16 or 32 or 64 device addresses depending upon the DASD configuration installed and whether any 3350 drive or 3350 compatibility mode.**

**NOTE:**

Customers who may elect to purchase Control Store Extension (#2150) and later upgrade to Expanded Control Store (#2152) should consider the purchase of Expanded Control Store (#2152) initially because this field upgrade requires replacement of Control Store Extension (#2150) and installation of Expanded Control Store (#2152). The prerequisite of Control Store Extension (#2150) for #9315 or #9317 can be satisfied by Expanded Control Store (#2152).

**MULTIPLEXER SUBCHANNELS, ADD’L (#4953, 4954).** To increase the number of I/O devices on the byte multiplexer channel, the number of subchannels can be increased by specifying one of the following: #4953 for 128, or #4954 for 256. The maximum number of shared subchannels is eight. When 256 multiplexer subchannels are installed there are NO shared subchannels. Note: The number of Multiplexer Subchannels does not affect the number of UCWs specified for this Block Multiplexer Channel(s). See Block Multiplexer Subchannels, Add’l (#1450) specify. Field installation: Yes.

**REGISTER EXPANSION (#6111).** Provides additional registers for microprogram use on the ISC ... see 'Specify' under Integrated Storage Control (#4660) to determine when required. **Maximum:** One. Field installation: Yes.

**INTEGRATED 3203-4 PRINTER ATTACHMENT, FIRST PRINTER (#8075).** Provides the capability to natively attach the 3203 Printer mdl 4. **Maximum:** One. **Field installation:** Yes. **Specify:** #4623 to allow unit address definition of the natively attached 3203 Printer mdl 4 from the display console keyboard. **Prerequisite:** Integrated 3203-4 Printer Attachment, First Printer (#8075).

**TWO CHANNEL SWITCH (#8100).** To attach the Integrated Storage Control (#4660) to a second channel, ... the two channels may be on the same or different CPUs. Switching is under program control. The ISC feature in the 3148 can be dedicated to a single channel by means of an Enable/Disable switch. **Maximum:** One. **Field installation:** Yes. **Specify:** See 'Prerequisites' under ISC (#4660).

**Special feature Prices:**

- MRC 4 yr Purchase MMMC
- Channel-to-Chen Adjtp 1850 $326 $297 $12,510 $14.00
- Control Store Extension 2150 262 238 8,350 11.00
- Expanded Control Store 2162 241 363 13,420 22.50
- Direct Control 3274 146 133 5,640 4.00
- Emergency Power-Off Control for 2 switches 3621 NC NC NC NC
- for up to 12 switches 3622 NC NC NC NC
- First Printer 8075 180 164 4,750 30.00
- Second Printer 8076 180 164 4,750 30.00
- Two Channel Switch 8100 205 186 7,075 11.00

* MRC and MLC prices effective June 1, 1979.
* CPU diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $405 on purchased machines to include any number of diskette-only changes ordered on same diskette.
* Feature supplies CPU diskette.
* This feature supplies ISC diskette.
* CPU diskette-only special feature. No fee when ordered at time of manufacture or when field installed. $405 on purchased machines when combined with changes subject to distribution fee to include any number of diskette-only changes ordered on the same diskette.

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3155 PROCESSING UNIT

[The 3155 is no longer available; features and model changes can be ordered on an "as available" basis.]

Purpose: Performs arithmetic, logic and control functions for a S/370 mdl 155.

Model H: Used with one 3360 mdl 1 in a S/370 mdl H155 (262,144 bytes).
Model HG: Used with one 3360 mdl 2 in a S/370 mdl HG155 (393,216 bytes).
Model I: Used with one 3360 mdl 3 in a S/370 mdl I155 (524,288 bytes).
Model IH: Used with one 3360 mdl 1 and one 3360 mdl 3 in a S/370 mdl IH155 (786,432 bytes).
Model J: Used with two 3360 mdl 3s in a S/370 mdl J155 (1,048,576 bytes).
Model JI: Used with three 3360 mdl 3s in a S/370 mdl JI155 (1,572,864 bytes).
Model K: Used with four 3360 mdl 3s in a S/370 mdl K155 (2,097,152 bytes).

Highlights: Depending upon the model, can attach up to 2,097,152 bytes of processor storage with a 2.1 microsecond cycle time. 16 byte parallel data flow includes 8,192 bytes of 60 nanosecond cycle buffer storage which is transparent to the processor and reduces the effective cycle time of processor storage. Sixteen general purpose and four floating point registers are controlled by a 69 nanosecond access read-only storage.

Standard features include: universal instruction set, 14 new instructions, interval timer, time-of-day clock, multiaccess facility, and correction code on main storage. Instruction retry is controlled by a 69 nanosecond access read-only storage.

Byte Multiplexer Channel—permits simultaneous operation of many low-speed devices. Can be operated in "burst" mode for attachment of high-speed devices. For OS exclusion, refer to SRL GC26-6554, System/370 Operating Systems System Generation.

Channel permits overlap of processor I/O with different processing units and external devices. Maximum: one.

Special Features:


2. RETAIN/370: #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to telephone line.


MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To Processor Storage (bytes) Byte Multiplexer Subchannels | Block Multiplexer Subchannels | MAC/ MRC Purchase MMMC

<table>
<thead>
<tr>
<th>Model</th>
<th>Processor Storage (bytes)</th>
<th>Byte Multiplexer Subchannels</th>
<th>Block Multiplexer Subchannels</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>262,144</td>
<td>128</td>
<td>96</td>
</tr>
<tr>
<td>HG</td>
<td>393,216</td>
<td>192</td>
<td>160</td>
</tr>
<tr>
<td>I</td>
<td>524,288</td>
<td>256</td>
<td>224</td>
</tr>
<tr>
<td>IH</td>
<td>686,432</td>
<td>256*</td>
<td>252</td>
</tr>
<tr>
<td>J</td>
<td>1,046,576</td>
<td>256**</td>
<td>480</td>
</tr>
<tr>
<td>JI</td>
<td>1,572,864</td>
<td>256**</td>
<td>480</td>
</tr>
<tr>
<td>K</td>
<td>2,097,152</td>
<td>256**</td>
<td>480</td>
</tr>
</tbody>
</table>

* Can be increased to 384 by adding 2nd Byte Multiplexer Channel (#4990).
** Can be increased to 512 by adding 2nd Byte Multiplexer Channel (#4990).

Console Function—standard system control panel is located on the 3155. It has switches and lights necessary to operate and control the system. A systems console I/O function is provided by adding either a 3210 Console Printer-Keyboard mdl 1 (5.15 cps) or a 3215 Console Printer-Keyboard (55 cps) mounted on the console table reading board. One of these is required. See "Special Features" for attachment features.

A 3210 Mdl 2 Adapter (#7845) can also be used to attach a remote 3210 Console Printer-Keyboard mdl 2.

PREREQUISITES: In addition to appropriate 3360 Processor Storage(s), each 3155 also requires a 3210 Console Printer-Keyboard mdl 1 or a 3215 Console Printer-Keyboard.

Each model of the 3155 has been designed for interconnected operation with a specified number of 3360 Processor Storage Units and operators who wish to order the 3155 for use without the specified number of 3360s should submit an RPQ to provide the necessary safety elements (covers, connectors, etc.) and the changes required for quality testing and installing.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.

[2] Console Table (Reading Board) Extension: #9824 for extension to operator's right, or #9825 for extension to left.

[3] Cabling: #9080 for below floor, or #9081 for on the floor.

[4] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.


[7] RETAIN/370: #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to telephone line.

PRICES: Mdl | MAC/ MRC | Purchase MMMC

<table>
<thead>
<tr>
<th>Mdl</th>
<th>Processor Storage (bytes)</th>
<th>Byte Multiplexer Subchannels</th>
<th>Block Multiplexer Subchannels</th>
<th>MAC/ MRC</th>
<th>Purchase MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>262,144</td>
<td>128</td>
<td>96</td>
<td>1,017,300</td>
<td>1,675</td>
</tr>
<tr>
<td>HG</td>
<td>393,216</td>
<td>192</td>
<td>160</td>
<td>1,018,500</td>
<td>1,675</td>
</tr>
<tr>
<td>I</td>
<td>524,288</td>
<td>256</td>
<td>224</td>
<td>1,019,700</td>
<td>1,675</td>
</tr>
<tr>
<td>IH</td>
<td>686,432</td>
<td>256*</td>
<td>252</td>
<td>1,044,800</td>
<td>1,690</td>
</tr>
<tr>
<td>J</td>
<td>1,046,576</td>
<td>256**</td>
<td>480</td>
<td>1,047,000</td>
<td>1,690</td>
</tr>
<tr>
<td>JI</td>
<td>1,572,864</td>
<td>256**</td>
<td>480</td>
<td>1,162,900</td>
<td>1,740</td>
</tr>
<tr>
<td>K</td>
<td>2,097,152</td>
<td>256**</td>
<td>480</td>
<td>1,162,900</td>
<td>1,745</td>
</tr>
</tbody>
</table>

Plan Offering: Plan A, Additional Use Charge Rate: 10% Warranty: A Purchase Option: 55% Maintenance: D Metering: Base Unit Useful Life Category: 2 Per Call: 3

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To Processor Storage (bytes) Byte Multiplexer Subchannels | Block Multiplexer Subchannels | MAC/ MRC | Purchase MMMC |

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>Processor Storage (bytes)</th>
<th>Byte Multiplexer Subchannels</th>
<th>Block Multiplexer Subchannels</th>
<th>MAC/ MRC</th>
<th>Purchase MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>G</td>
<td>$1,200</td>
<td>$2,400</td>
<td>$27,300</td>
<td>$29,700</td>
<td>$144,900</td>
</tr>
<tr>
<td>HG</td>
<td>I</td>
<td>2,400</td>
<td>1,019,700</td>
<td>1,675</td>
<td>1,690</td>
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<td>J</td>
<td>525,288</td>
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<td>1,745</td>
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<tr>
<td>JI</td>
<td>K</td>
<td>2,097,152</td>
<td>480</td>
<td>1,162,900</td>
<td>1,745</td>
<td>1,745</td>
</tr>
</tbody>
</table>

The model conversion prices above are applicable only when the 3155 is used with the combinations of 3360 Processor Storage as indicated under "Models" above. Prices do not include those of the required 3360(s).

SPECIAL FEATURES

BLOCK MULTIPLEXER CHANNEL (#1433-1435). Each adds a channel for attachment of I/O devices for devices that can be attached see S/370 in "Systems." The channel permits overlapping I/O operation with processing. Eight control unit positions are provided on each channel. #1433 for block multiplexer channel ... #1434 for fourth ... #1435 for fifth. Limitation: #1434 cannot be installed if Second Byte Multiplexer Channel (#4990) is installed. Field Installation: Yes. Prerequisites: #1434 requires #1433 ... #1435 requires #1434 or #4990.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (either S/360 or S/370). Only one of the processors requires this feature. Uses one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. Maximum: One. Field Installation: Yes.

DIRECT CONTROL (#3274). Provides two instructions, "Read Direct" and "Write Direct," and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide timing signals and transfer a single byte of information, normally for controlling or synchronizing purposes, between two cable-connected processing units, or a cable-connected processing unit and external devices. Maximum: One. Cab Order: Required. Field Installation: Yes. Prerequisites:

† NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.
EMERGENCY POWER-OFF CONTROL (#3621, 3622). To provide, in effect, a single emergency power-off switch in a "room" or "area." see Emergency Power-Off under "Systems." #3621 -- to interconnect two emergency power-off switches. #3622 -- to interconnect up to twelve emergency power-off switches. Field Installation: Yes.

EMERGENCY POWER-OFF PANEL EXPANSION (#3625). The basic S/370mdl 155 provides emergency power-off control for up to 16 control units. When single mdl 155 configurations exceed this limit, Emergency Power-Off Panel Expansion (#3625) should be ordered. Each #3625 attaches up to four additional EPO terminations. Maximum: Five. Where assistance is needed in determining requirements, consult with Installation Planning Representatives.

EXTENDED PRECISION FLOATING POINT (#3700). Provides instructions to handle extended precision (28-hexadecimal digit fraction) floating point operands. Extended precision operands may also be rounded to long-precision format, which in turn may be rounded to short-precision format. Limitation: Cannot be installed with 7070/7074 Compatibility (#7117). Field Installation: Yes.

1401/40/60, 1410/7010 Compatibility (#3950). Provides the system with the ability to execute 1401/1440/1460 and 1410/7010 instructions under specific conditions of minimum and matching configurations. See P 360N pages for DOS and P 360C pages for OS. Field Installation: Yes.

SECOND BYTE MULTIPLEXER CHANNEL (#4990). [Models IH, J, Ji, K] Provides the same function as the standard multiplexer channel in the normal sense. The number of subchannels to be used is increased from 384 on model IH, and to 512 on models J, Ji and K. Takes the place of block multiplexer channel number four. Limitation: Cannot be installed with Channel-to-channel Adapter (#4990). Field Installation: Yes. Prerequisite: Block Multiplexer Channel No. 4 (#1434). Installation Planning instructions under specific conditions of minimum and matching configurations. See P 360N pages in "Programming." Field Installation: Yes.

OS/DOS Compatibility (#5450). Provides the system with the ability to execute DOS programs under specific conditions. See P 360C pages. Limitation: Cannot be installed with Extended Precision Floating Point (#3700). Field Installation: Yes.

7070/7074 Compatibility (#7117). Provides the system with the ability to execute 7070/7074 instructions under specific conditions. See P 360C pages. Limitation: Cannot be installed with Extended Precision Floating Point (#3700). Field Installation: Yes.

3210 Mdl 1 ADAPTER (#7844). To attach a 3210 Console Printer-Keyboard mdl 1 (15.5 cps) for system console I/O. Includes after-display ability. Position of the unit to the right or left of the operator depends upon the Console Table Extension (#9824 or #9825). See "Specify." Limitation: Cannot be installed with Block Multiplexer Channel or Block Multiplexer Channel number four. Maximum: One. Field Installation: Yes. Prerequisite: Uses one address on the standard byte multiplexer channel but does not use a control unit position.

3210 Mdl 2 ADAPTER (#7845). To attach a free-standing 3210 Console Printer-Keyboard mdl 2, for remote system console I/O. Limitation: Maximum distance from the console is 75 feet. Maximum: One. Cable Order: Required. Field Installation: Yes. Prerequisite: Either a 3210 Mdl 1 Adapter (#7844) or a 3215 Adapter (#7855). Uses one control unit position on a byte or block multiplexer channel.

3215 ADAPTER (#7855). To attach a 3215 Console Printer-Keyboard (65 cps) for system console I/O. Includes after-display ability. Position of the unit to the right or left of the operator depends upon the Console Table Extension (#9824 or #9825). See "Specify." Limitation: Cannot be installed with 3210 Mdl 1 Adapter (#7844). Maximum: One. Field Installation: Yes. Prerequisite: Uses one address on the standard byte multiplexer channel but does not use a control unit position.
IBM 3158 PROCESSING UNIT

Purpose: Performs arithmetic, logic, processor storage and control functions for a S/370 model 158.

Models     Bytes of Processor Storage

<table>
<thead>
<tr>
<th></th>
<th>AP1</th>
<th>MP1</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>524,288</td>
<td></td>
</tr>
<tr>
<td>J</td>
<td>1,048,576</td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>1,572,864</td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>2,097,152</td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>3,145,728</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>4,194,304</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>5,242,880</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>6,291,456</td>
<td></td>
</tr>
</tbody>
</table>

Highlights:
- Depending upon the model contains up to 6,291,456 bytes of monolithic processor storage with a cycle time of 1,035 nanoseconds for a 16-byte read, of 690 ns for an 8-byte write, 920 ns for a write of 1 to 7 bytes, and 920 ns for a write of 9 to 16 bytes. 16 byte parallel data flow includes 8,192 bytes of buffer storage which is transparent to the programmer and reduces the effective cycle time of processor storage. Sixteen general purpose and four floating point registers are implemented in high speed internal circuits with a four byte data flow. The 115 nanosecond cycle CPU and I/O functions are controlled by reloadable control storage. An internal integrated power-off control feature allows direct attachment of 3330, 3340, 3344, 3350 direct access storage devices. Attached processing is provided by attachment of a 3052 Attached Processing Unit md 1.

Standard features include: S/370 universal instruction set ... interval timer ... store and fetch protect ... byte oriented operand feature ... error checking and correction code on main storage ... instruction execution time of one byte multiplexer channel ... block multiplexer channels number one and two ... dynamic address translation ... extended control mode ... program event recording ... time-of-day clock with clock comparator ... CPU timer ... channel indirect addressing function for channels ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... clear I/O. Four additional instructions on MP models -- signal processor ... set prefix ... store prefix ... store CPU address.

Byte Multiplexer Channel: Permits simultaneous operation of many low-speed devices. Can be operated in "burst" mode for attachment of high-speed devices. For OS exclusion, refer to SRL GC26-8554, OS System Generation, ... for OS/VS exclusion, refer to SRL GC26-3791, OS/VS System Generation, and SRL GC26-3792, OS/VS System Generation. Eight control unit positions are provided on the channel.

Block Multiplexer Channels: Up to five ... first two are standard and up to three may be attached. See "Special Features." Permits simultaneous operation of high-speed devices ... ability to 'Block Multiplex' provides greater channel efficiency when using direct access storage devices equipped with rotational position sensing or buffered devices ... provides block multiplexing compatible with the same function on the 2860 Block Multiplexer Channel ... operates as a conventional selector channel otherwise.

Subchannels: 256 non-shared subchannels or 120 non-shared and 8 shared subchannels on 1st Byte Multiplexer Channel ... 256 unshared or 120 non-shared and 8 shared subchannels on 2nd Byte Multiplexer Channel 16 shared subchannels on Block Multiplexer Channels ... 400 unshared subchannels on Block Multiplexer Channels.

Console Function: A Display Console is standard ... includes light pen, keyboard, cathode ray tube, two console files and control store ... functions as a manual console for IPL, reset, etc., as an operator's console to communicate with the operating system, an indicated display console, and as a diagnostic console for maintenance ... optional attachment for a 3213 Printer (85 cpm) for hard copy output. CRT has twenty-five 80-character lines of information; as a system console, the last line displays machine status. Optional attachment for a 3056 Remote System Console for operation from an additional keyboard and cathode ray tube up to 150 feet from the processor.

In "Printer-Keyboard" mode, the Display Console uses the keyboard for input and CRT and mandatory 3213 for output. It appears to the system as a 3215, and is supported by DOS, DS/VS, OS/360, OS/VS and VM/370. In "Display" mode, the keyboard and light pen are used for input, the CRT for output, and DDCS support or equivalent is required. The 3213 (optional) has a separate address and requires MCS support or equivalent.

The Display Console replaces the conventional indicators and switches with displays, and diagnostics can be loaded under light pen control from one of the console files.

PREREQUISITES: Each AP system requires (1) a 3158 A series processing unit, (2) a 3052 APU md 1, (3) a 3056 Remote System Console md 1. Identical MP CPU models are required for a multiprocessor system. The 3058 Multisystem Unit is required for each one or two processor MP system.

Bibliography:
- GC20-0001
- SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, or #9005 for 230 V.
- [2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
- [3] Console Table (Reading Board) Extension: #9824 for extension to operator's right, or #9825 for extension to left.
- [4] Cabling: #9080 for below the floor, or #9081 for on the floor.
- [5] Emergency Power-Off Control: May be required ... see Special Features and S/370 Installation Manual - Physical Planning, GC22-7004 for details. If two processors are installed and the 3052 is to be added and emergency power off ability is required on the systems, then the expanded Emergency Power Off Control (#3622) should be ordered for the host processor.
- [7] RETAIN/370: Provided by integrated data adapter which is standard on the console. Customers must provide interface to telephone line.
- [8] CPU Position: #9441 for left CPU in MP configuration, or #9442 for right.

Processor Attach Feature: When one processor is combined with another in a multiprocessor system, each processor must contain sufficient Storage Protect capability for the total storage in the system. Therefore, each processor must add additional Storage Protect capability to reflect the storage in the remote processor. The first megabyte of Storage Protect capability for the remote processor is included in the MP1 and MP2 Processor. One Processor Attach feature is required in an MP processor for each additional megabyte, beyond the first megabyte in the remote processor. See "Special Features."
3158 to 3158 MODEL CONVERSION PURCHASE PRICES

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>AP1</th>
<th>AP2</th>
<th>AP3</th>
<th>AP4</th>
<th>AP5</th>
<th>AP6</th>
<th>AP7</th>
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<td>J</td>
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</tbody>
</table>

Notes:
1. There are no additional installation charges over the above model conversion and model upgrade prices.
2. The above model conversions and model upgrades are field installable.
3. Planning for Model Conversions and Model Upgrades: When a customer requires storage upgrades in addition to a model conversion, the changes must not be consolidated into a single model. Storage upgrades for storage above two megabytes should be ordered individually in one megabyte increments.
4. When an MP storage upgrade is submitted, the proper number of Processor Attach features (#5552) for the remote processor should be ordered.
5. When an AP storage upgrade is submitted, the proper number of Processor Attach features (#5552) for the remote processor must be ordered.
6. When an upgrade to an MP system is submitted, the proper number of Processor Attach features (#5552) for the remote processor must be ordered.
7. 3158 units with System/370 Extended (#7730) that are converted to an AP model require System/370 Extended, Add'1 (#7731) on the AP model processing unit.
8. 3158 units with System/370 Extended (#7730) that are converted to an AP model require System/370 Extended (#7730) and System/370 Extended, Add'1 (#7731) on both processing units.

SPECIAL FEATURES

BLOCK MULTIPLEXER CHANNEL (#1433-1435). Each adds a channel for attachment of I/O devices for devices that can be attached to 'Systems.' The channel permits overlapped I/O operation with processing. Eight control unit positions are provided on each channel. Channel Indirect Addressing is included in each channel. #1433 -- for third block multiplexer channel ... #1434 -- for fourth ... #1435 -- for fifth. Limitation: #1434 cannot be installed if 2nd Byte Multiplexer Channel (#4990) is installed. Field Installation: Yes. Prerequisites: #1434 requires #1433 ... #1435 requires #1434 or #4990.

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (either S/360, S/370 or 4341 Processor). Only one of the processors requires this feature. Uses one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. Maximum: One. Field Installation: Yes.

ISC CONTROL STORE EXTENSION (#2150). Provides additional control store for microprogram use on the ISC. Requires one control unit position on each of the connected channels. Function can be expanded under program control so that the adapter will operate as a standard control unit. Maximum: One. Field Installation: Yes.

EXPANDED CONTROL STORE (#2151). Provides additional control store for microprogram use on the ISC...
### FIRST BYTE MULTIPLEXER CHANNEL ( cont'd )

**3318/2 Processor** (A, A1, or A2) on any 3340 Models A2 or B1 and/or Remote Processor Channel Switch #7731. Provides up to four 3340 Models A2 or B1 and/or Remote Processor Channel Switch #7731.

<table>
<thead>
<tr>
<th>DASD Configuration</th>
<th>Required DASD Specifiers</th>
<th>3313</th>
<th>3314</th>
<th>3315</th>
<th>3316</th>
<th>3317</th>
<th>3318</th>
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<tbody>
<tr>
<td>One or two 3340 Model A2 with associated 3340 Model B1 or B2</td>
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<td>String Switch 3150 on any 3340 Model A2</td>
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<tr>
<td>Up to four 3340 Model A2 with associated 3340 Model B1 or B2</td>
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<tr>
<td>String Switch 3150 on any 3340 Model A2</td>
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<tr>
<td>Fixed Head Feature #350/450 or any 3340</td>
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</table>

**SECOND BYTE MULTIPLEXER CHANNEL ( #4990 ).** Provides the same function as the standard multiplexer channel, but with special features. Addresses the place of Block Multiplexer Channel No. 4. Limitation: Cannot be installed with Block Multiplexer Channel No. 4 (#1434). Field Installation: Yes. Prerequisite: Block Multiplexer Channel No. 3 (#1433).

### OS/DOS COMPATIBILITY ( #5480 ).

Provides the system with the ability to execute DOS programs under specific conditions. See P 3600 pages in "Programming." Field Installation: Yes. Limitation: This feature cannot be loaded, at IPL time, concurrently with System/370 Extended ( #7730 ), System/370 Extended, Add'1 ( #7731 ), or with OS/VS1 ECPS ( Extended Control Program Support ) ( #8750 ).

### PROCESSOR ATTACH ( #5522 ).** [MP model only] One is required for each megabyte of storage over one megabyte in the remote processor of an MP system.

**Remote Processor** Quantity of Processor Storage Size Attach Features (megabytes) (Required)

<table>
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<tr>
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</tbody>
</table>

Field Installation: Yes. Corequisite: MP Model.

**POWER WARNING ( #5760 ).** Provides signal to the 3158 system when power is outside specified limits. Prerequisites: All models require customer supplied uninterruptible power supply with line sensor. MP models also require a field installation. Maximum: One.

**REGISTRATION EXPANSION ( #6111 ).** Provides additional registers for microprogram use on the ISC. See "Specify" under Integrated Storage Control ( #4650 ) to determine when required. Field Installation: Yes. Maximum: One.

**REMOTE SWITCH ATTACHMENT ( #6148 ).** [MP model only] To attach to the Two Channel Switch for ISC ( #7905 ) to the configuration listed in the Switch Control panel on the 3008 Multisystem Unit. Maximum: One. Field Installation: Yes. Prerequisite: One Channel Switch for ISC ( #7905 ).

### SYSTEM/370 EXTENDED ( #7730 ).

Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. Field Installation: Yes. Prerequisite: Required, together with System/370 Extended, Add'1 ( #7731 ), on each processor in an MP system and on the A-series processor in an AP system. System/370 Extended ( #7730 ) is also required on the 3052 Attached Processing Unit in an AP system. Limitation: This feature cannot be loaded, at IPL time, concurrently with System/370 Extended, Add'1 ( #7731 ), or with OS/VS1 ECPS ( Extended Control Program Support ) ( #8750 ).

### SYSTEM/370 EXTENDED, ADD'1 ( #7731 ).

Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. Field Installation: Yes. Prerequisites: Required, together with System/370 Extended ( #7730 ), on each processor in an MP system, and on the A-series processor in an AP system. System/370 Extended ( #7730 ) is also required on the 3052 Attached Processing Unit in an AP system. System/370 Extended ( #7730 ) is also required on the 3052 Attached Processing Unit in an AP system. Limitation: This feature cannot be loaded, at IPL time, concurrently with System/370 Extended, Add'1 ( #7731 ), or with OS/VS1 ECPS ( Extended Control Program Support ) ( #8750 ).

### 3056 REMOTE CONSOLE ATTACHMENT ( #7820 ).

Provides attachment to the Display Console of an optional console up to 150 feet away. Maximum: One. Field Installation: Yes.
**DP Machines**

3158 Processing Unit (cont'd)


**TWO CHANNEL SWITCH FOR ISC (#7905).** To provide each of the two paths of an ISC with the capability of attaching to a second channel. The channels may be on the same CPU or different CPUs. Switching is under program control. Each path of the ISC can be dedicated to a single channel by means of a Configuration Switch. Maximum: One. Field Installation: Yes. Prerequisites: An available control unit position and eight unshared subchannels on a system block multiplexer channel. For S/360 mdls 195 and S/370 mdls 165, 168, 195, see 2880 Block Multiplexer Channel. For S/370 mdls 135, 135-3, 138, 145, 145-3, 148, 155, 158, 3031, 3032, or 3033, see 3135, 3135-3, 3138, 3145, 3145-3, 3148, 3155, 3158, 3031, 3032, 3033 respectively. For 4300 Processors, see 4341.

**VIRTUAL MACHINE ASSIST (#8740).** Provides assist to VS operating systems operating under VM/370 by emulation of certain privileged operations. This function is also included in and enabled by the OS/VS1 ECPS (Extended Control Program Support) (#8750). Field Installation: Yes. Limitation: This feature cannot be loaded, at IMPL time, concurrently with 7070/7074 Compatibility (#7117), System/370 Extended (#7730), or with System/370 Extended, Add'l (#7731).

OS/VS1 ECPS (EXTENDED CONTROL PROGRAM SUPPORT) (#8750). Provides assist to OS/VS1 by emulation of certain supervisor functions. This feature also includes and enables Virtual Machine Assist and Extended Precision Floating Point functions. Prerequisite Feature must be selected at system generation on OS/VS1 Release 6 or subsequent releases. Limitations: This feature cannot be loaded, at IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), 7070/7074 Compatibility (#7117), or in Multiprocessing Mode. Field Installation: Yes.

### Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>TLP/MAC/MLC</th>
<th>MRC</th>
<th>4 Yr Purch</th>
<th>MMMC</th>
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<tr>
<td>Block Multiplexer Channel</td>
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<td>3rd</td>
<td>1433</td>
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<td>for 2 switches</td>
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<td>722.00</td>
</tr>
<tr>
<td>Power Warning</td>
<td>5760</td>
<td>142</td>
<td>130</td>
<td>5,725</td>
</tr>
<tr>
<td>Register Expansion</td>
<td>6111</td>
<td>47</td>
<td>43</td>
<td>1,330</td>
</tr>
<tr>
<td>Remote Switch Attachment</td>
<td>6148</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>7070/7074 Compatibility</td>
<td>7117</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>Staging Adapter for ISC</td>
<td>7220†</td>
<td>2,065</td>
<td>1,875</td>
<td>63,200</td>
</tr>
<tr>
<td>System/370 Extended</td>
<td>7730</td>
<td>715</td>
<td>650</td>
<td>13,000</td>
</tr>
<tr>
<td>System/370 Extd, Add'l</td>
<td>7731</td>
<td>240</td>
<td>200</td>
<td>4,000</td>
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<tr>
<td>3056 Remote Consol Attch</td>
<td>7820</td>
<td>51</td>
<td>47</td>
<td>2,545</td>
</tr>
<tr>
<td>3213 Printer Attachment</td>
<td>7840</td>
<td>114</td>
<td>104</td>
<td>5,545</td>
</tr>
<tr>
<td>Two Channel Sw for ISC</td>
<td>7805</td>
<td>351</td>
<td>319</td>
<td>14,220</td>
</tr>
<tr>
<td>Virtual Machine Assist</td>
<td>8740</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>OS/VS1 Extended Control Program Support</td>
<td>8750</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
</tbody>
</table>

* Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this feature involves removal of parts which become the property of IBM."

† Feature supplies ISC diskette.

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**IBM 3158-3 PROCESSING UNIT**

**Purpose:** Performs arithmetic, logic, processor storage and control functions for a S/370 md1 158.

<table>
<thead>
<tr>
<th>Models</th>
<th>Bytes of Processor Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>U31</td>
<td>A31 M31 524,288</td>
</tr>
<tr>
<td>U32</td>
<td>A32 M32 1,045,576</td>
</tr>
<tr>
<td>U33</td>
<td>A33 M33 1,572,864</td>
</tr>
<tr>
<td>U34</td>
<td>A34 M34 2,097,152</td>
</tr>
<tr>
<td>U35</td>
<td>A35 M35 3,145,726</td>
</tr>
<tr>
<td>U36</td>
<td>A36 M36 4,194,304</td>
</tr>
<tr>
<td>U37</td>
<td>A37 M37 5,242,880</td>
</tr>
<tr>
<td>U38</td>
<td>A38 M38 6,291,456</td>
</tr>
</tbody>
</table>

**Highlights:** Depending upon the model contains up to 6,291,456 bytes of monolithic processor storage with a cycle time of 1035 nanoseconds for a 16-byte read, of 690 ns for an 8-byte write, 920 ns for a write of 1 to 7 bytes, and 920 ns for a write of 9 to 16 bytes... 16 byte parallel data flow... includes 16,384 bytes of buffer storage which is transparent to the programmer and reduces the effective size of processor storage. Special purpose and four floating point registers are implemented in high speed internal circuits with a four byte data flow. The 115 nanosecond cycle CPU and I/O functions are controlled by reloadable control storage. An optional integrated storage control feature allows direct attachment of 3330, 3340, 3444, 3540 direct access storage devices. 128 word instruction buffer, improved instruction execution time over the 3158, increased block multiplexer subchannel pool over the 3158. Asymmetric multiprocessor storage. An attached CPU power down while all storage is left available to the other processor (MP models only). Attached Processing is available by attachment of a 3052 Attached Processing Unit md1.

**Standard features include:** S/370 universal instruction set... interval timer... store and fetch protect... byte oriented operand features... error checking and correction code on main storage... instruction retry... channel retry... one byte multiplexer channel... block multiplexer channels number one and two... dynamic address translation... extended control mode... program recording... time-of-day clock with clock comparator... CPU timer... channel indirect addressing function for channels... compare and swap... compare double and swap... set PSW key from address... clear I/O. Four additional instructions on M models — signal processor... set prefix... store prefix... store CPU address.

**Byte Multiplexer Channel:** Permits simultaneous operation of many low-speed devices. Can be operated in “burst” mode for attachment of high-speed devices. For OS exclusion, refer to SRL GC26-655, for OS/VS exclusion, refer to SRL GC26-3791, OS/VS1 System Generation, and SRL GC26-3792, OS/VS2 System Generation. Eight control unit positions are provided on the channel.

**Block Multiplexer Channels:** Up to five... first two are standard... up to three more can be attached. See "Special Features." Permits simultaneous operation of high-speed devices... to "lock Multiplexer," provides greater channel efficiency when direct access storage devices equipped with rotational position sensing or buffered devices... provides block multiplexing compatible with the same function on the 5280 Block Multiplexer Channel... operates as a conventional selector channel otherwise.

**Subchannels:** In a 3158-3, byte multiplexer channel 0 or 4 may have 256 non-shared subchannels less 16 or 32 for each shared subchannel. A 3158-3 block multiplexer channel may have 40 shared subchannels when the second byte multiplexer channel is not installed. When the second byte multiplexer channel is installed, the block multiplexer channel may have 32 shared subchannels. The block multiplexer channel may have 736 nonshared subchannels when the second byte multiplexer channel is not installed. When the second byte multiplexer channel is installed, the block multiplexer channel may have 736 nonshared subchannels when the second byte multiplexer channel is installed.

**Console Function:** A Display Console is standard... includes light pen, keyboard, cathode ray tube, two console files and control store... functions as a manual console for IPL, reset, etc., as an operator's console to communicate with the operating system, an indicator display console, and as a diagnostic console for maintenance... a diagnostic attachment for a 3213 Printer (85 cps) for hard copy output. CRT has twenty-five 80-character lines of information; as a system console, the last line displays machine status. Optional attachment for a 3056 Remote System Console for console operation from an additional keyboard and cathode ray tube up to 150 feet from the processor.

In "Printer-Keyboard" mode, the Display Console uses the keyboard for input and CRT and mandatory 3213 for output. It appears to the system as a 3215, and is supported by DOS, DOS/VS, OS/360, OS/VS and VM/370. In "Display" mode, the keyboard and light pen are used for input, the CRT for output, and DDODDS support or equivalent is required. The 3213 (optional) has a separate address and requires MCS support or equivalent.

**Price:** $42,280 $38,440 $1,381,100 $2,360

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### Notes:

1. There are no additional installation charges over the above model conversion and model upgrade prices.
2. The above model conversion and model upgrades are field installable.
3. Planning for Model Conversions and Model Upgrades: When a customer requires storage upgrades in addition to a model conversion, the changes must not be consolidated into one megabyte. Also, storage upgrades for storage above two megabytes should be ordered in one megabyte increments.

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3158-3 to 3158-3 Model UPGRADE Purchase Prices</td>
<td>$37,500</td>
</tr>
<tr>
<td><strong>U32</strong></td>
<td>$37,500</td>
</tr>
<tr>
<td><strong>U33</strong></td>
<td>$37,500</td>
</tr>
<tr>
<td><strong>U34</strong></td>
<td>$90,000</td>
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<tr>
<td><strong>U35</strong></td>
<td>$75,000</td>
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<tr>
<td><strong>U36</strong></td>
<td>$75,000</td>
</tr>
<tr>
<td><strong>U37</strong></td>
<td>$75,000</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3158-3 to 3158-3 Model UPGRADE Purchase Prices</td>
<td>$37,500</td>
</tr>
<tr>
<td><strong>A32</strong></td>
<td>$37,500</td>
</tr>
<tr>
<td><strong>A33</strong></td>
<td>$37,500</td>
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<td><strong>A34</strong></td>
<td>$90,000</td>
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<td><strong>A35</strong></td>
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<td><strong>A36</strong></td>
<td>$75,000</td>
</tr>
<tr>
<td><strong>A37</strong></td>
<td>$75,000</td>
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#### 3158-3 Model Changes

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3158-3 to 3158-3 Model CONVERSION Purchase Prices</td>
<td>$85,900</td>
</tr>
<tr>
<td>3158-AP to 3158-A3</td>
<td>$85,900</td>
</tr>
<tr>
<td>3158-MP to 3158-M3</td>
<td>$85,900</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3158-3 to 3158-3 Model CONVERSION Purchase Prices</td>
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<td>3158-US to 3158-A3</td>
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</tr>
<tr>
<td>3158-A3 to 3158-M3</td>
<td>$79,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3158-3 to 3158-3 Model CONVERSION Purchase Prices</td>
<td>$137,500</td>
</tr>
<tr>
<td>3158-US to 3158-A3</td>
<td>$90,000</td>
</tr>
<tr>
<td>3158-A3 to 3158-M3</td>
<td>$90,000</td>
</tr>
</tbody>
</table>

### Additional Features

- **Special Features**
  - **Block Multiplexer Channel** (Model 3158-3): Each adds a channel for attachment of I/O devices... for devices that can be attached see S/370 in “Systems.” The channel permits direct I/O operation with processing. Eight control unit positions are provided on each channel. Channel indirect addressing is included... the channel... fourth... fifth. Limitation: #1434 cannot be installed if 2nd Byte Multiplexer Channel (#4990) is installed. Field Installation: Yes. Prerequisites: #1433... #1435 requires #1434 or #4990.

### Extended Control Store Extension

- **ISC STORE EXTENSION** (Model 3158-3): Provides additional control store for microprogram use on the ISC (#4650). When the Staging Adapter for ISC (#7220) is NOT ordered, see “Specify” under Integrated Storage Controls (Category A) to determine when required. **Prerequisite:** ISC (#7220). Maximum: One. Field Installation: Yes.

### Expanded Control Store

- **Expanded Control Store** (Model 3158-3): Provides additional control store for microprogram use on the ISC... see “Specify” under Integrated Storage Controls (Category A) to determine when required. **Prerequisites:** Register Expansion (#6111), Expanded Control Store (Model 3158-3), and Staging Adapter for ISC (#7220). Maximum: One. Field Installation: Yes.

### Direct Control

- **Direct Control** (#3274): Provides two instructions, ‘Read Direct’ and ‘Write Direct,’ and six distinct external interrupt lines which are independent of data channel operations. The read and write instructions provide signal timing and transfer a single byte of information, normally for controlling or synchronizing purposes, between two cable-connected processing units, or a cable-connected processing unit and external devices. Maximum: One. **Cable Order:** Required. Field Installation: Yes. Prerequisites: External devices must meet the interface specifications outlined in S/370-Direct Control Feature-OMI, GA22-6845.

### Emergency Power-Off Control

- **Emergency Power-Off Control** (Model 3158-3): Provides a single emergency power-off switch in a “room” or “area.” **Prerequisites:** Emergency Power-Off Under S/370 in “Systems.” **3622** — to interconnect two emergency power-off switches... **3622** — to interconnect up to twelve emergency power-off switches. Field Installation: Yes.

#### Extended Precision Floating Point (Model 3158-3):

- Extended Precision floating point operands. This function is also available for addition to existing channels. The extended precision floating point function can be included in the baseline system configuration. The extended precision floating point function is provided as a standard control unit. Maximum: One. **Power-off Switches:** Field change from 3158-3 to 3158-3 is not recommended.

### Storage Controls

- **Integrated Storage Controls (ISC)** (#4650): Provides for the attachment of 3330s (mdls. 1 and/or 11) and/or 3340 mdls. A2s and/or 3350 mdls. A2s when Staging Adapter for ISC (#7220) is NOT ordered. Additional storage is provided by attaching 3330 modules to the 3330 or by attaching 3340 mdls. A2 or by attaching 3350 mdls. A2.

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3158-3 Processing Unit (cont'd)

and/or a model C to the 3350 MDL A2/A2F... see DASD Configuration below and 3330, 33300, 3340, 3344, 3350 'Machines' pages. The ISC is organized functionally into two separate paths with up to 16 drives per path... up to 32 drives per path when ISC Control Store Extension (#2150) is installed. Maximum: One.

Field Installation: Yes. Prerequisites: Each ISC path requires a control unit position on a block multiplexer channel. Specify: The following applies only when Staging Adapter for ISC (#7220) is NOT ordered.

The available combinations of storage devices which may be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Feature(s)" are installed. Based on the DASD, and the Special Features, listed below being ordered for them, order the required DASD Specify Feature(s). Note: The selected "Required DASD Specify Feature(s)" applies to both ISC paths. Within this constraint the DASD Configuration on one ISC path may be different from that on the other ISC path.

ISC (#4650) WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#7905)

<table>
<thead>
<tr>
<th>DASD Configuration</th>
<th>Required DASD Specify Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>One or two 3333s with associated 3333s.</td>
<td>x</td>
</tr>
<tr>
<td>Up to four 3333s with associated 3333s.</td>
<td>x</td>
</tr>
<tr>
<td>String Switch #8150 on any 3333.</td>
<td></td>
</tr>
<tr>
<td>String Switch #8150 on any 3340 MDL A2/2F with associated MDL B1/B2.</td>
<td>x</td>
</tr>
<tr>
<td>Up to four 3340 MDL A2/2F with associated MDL B1/B2.</td>
<td>x</td>
</tr>
<tr>
<td>String Switch #8150 on any 3340 MDL A2/2F.</td>
<td>x</td>
</tr>
<tr>
<td>Fixed Head Feature #4301/4302 on any 3340.</td>
<td></td>
</tr>
<tr>
<td>Up to four 3340 MDL A2Fs of which up to two may attach 3344s.</td>
<td>x</td>
</tr>
<tr>
<td>String Switch #8150 on any 3340 MDL A2/2F.</td>
<td></td>
</tr>
<tr>
<td>Fixed Head Feature #4301/4302 on any 3340.</td>
<td></td>
</tr>
<tr>
<td>Three 3333s and 3340 MDL A2s...</td>
<td>x</td>
</tr>
<tr>
<td>String Switch #8150 on any 3333 or 3340 MDL A2.</td>
<td>x</td>
</tr>
<tr>
<td>Fixed Head Feature #4301/4302 on any 3340.</td>
<td>x</td>
</tr>
<tr>
<td>Five 3333s and 3340 MDL A2s.</td>
<td>x</td>
</tr>
<tr>
<td>String Switch #8150 on any 3333 or 3340 MDL A2.</td>
<td></td>
</tr>
<tr>
<td>Fixed Head Feature #4301/4302 on any 3340.</td>
<td>x</td>
</tr>
</tbody>
</table>

Field Installation: Yes. Corequisite: MP Model.

POWER WARNING (#5760). Provides signal to the 3158/3158-3 system when power is outside specified limits. Prerequisites: All models require customer supplied uninterruptible power supply with line sensor. MP models also require special cable -- consult Physical Planning Representative. Field Installation: Yes.

Remote Processor Storage Size (Megabytes) Quantity of Processor Attach Features (Required)

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Size</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2</td>
<td>1</td>
<td>1-1/2</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

REMOTE SWITCH ATTACHMENT (#5148). [MP models only] To attach the Two Channel Switch for ISC (#7905) to the configuration control panel on the 3058 Multisystem Unit. Maximum: One.

Field Installation: Yes. Prerequisite: Two Channel Switch for ISC (#7905).

SYSTEM/370 COMPATIBILITY (#7117). Provides the system with the ability to execute SYSTEM/370 instructions under specific conditions... see P 360C pages in "Programming." Field Installation: Yes. Limitation: This feature cannot be loaded, at IPLM time, concurrently with System/370 Extended (#7730), System/370 Extended, Add'l (#7731), or with OS/VS1 EGPS (Extended Control Program Support) (#8750).

STAGING ADAPTER FOR ISC (#7220). Enables each path of the ISC to attach a maximum of four 3333 MDLs 1 and 11 and/or 3350 MDL A2/A2F's with associated 3330 MDLs 1, 2 and 11 and/or 3350 MDL B2/B2F 3350 MDL C2/C2F, for a maximum of 32 drives per path. See 3333, 3330 and 3350 for additional information. Also see note on M3333 pages for feature changes required when drive attachment is retained for use with a 3351. Provides up to 64 virtual 3330 addresses for each channel interface on each path of the ISC. Provides for the attachment of up to four Data Recording Controllers in one or two 3851 Mass Storage Facilities to each path of the ISC. Maximum: One. Field Installation: Yes... must include removal of any of the following which are installed: #9190, 9313, 9314, 9315, 9317, 9318. Prerequisites: Integrated Storage Controls (#4650) and ISC Control Store Extension (#2150). For 3350 attachment the additional prerequisites are Expanded Control Store Extension (#2151), Register Expansion (#6111) and ISC/SA Control Store Additional (#2152). Limitations: If Staging Switch (#8150) is installed on a 3333, writeup for this feature on 3333 'Machines' page. 3344s cannot be attached to the ISC when #7220 is installed. 3350 drives attached to the ISC when #7220 is installed cannot be used as staging drives and must be designated as real in the 3350 native mode only. 3350 devices may not be mixed with other type devices in the same string. Specify: #9318 (Staging Adapter 3333/3330/3350).

SYSTEM/370 EXTENDED (#7730). Provides S/370 Extended features which are a prerequisite for operation with the MVS/System Extensions Program Product. Field Installation: Yes. Prerequisites: Required, together with System/370 Extended, Add'l (#7731), on each processor in an MP system and on the A-series processor in an AP system. System/370 Extended (#7730) is also required on the 3052 Attached Processing Unit in an AP system. Limitation: This feature cannot be loaded, at

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3158-3 Processing Unit  (cont’d)  
IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#7117), Virtual Machine Assist (#8740), or with OS/V51 ECPS (Extended Control Program Support)(*8750).

**SYSTEM/370 EXTENDED, ADD’L (#7731).** Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Product. Field Installation: Yes.  
**Prerequisites:** Required, together with System/370 Extended (#7730), on each processor in an MP system, and on the A-series processor in an AP system. System/370 Extended (#7730) is also required on the 3052 Attached Processing Unit in an AP system. Limitation: This feature cannot be loaded, at IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), 7070/7074 Compatibility (#7730), Virtual Machine Assist (#8740), or with OS/V51 ECPS (Extended Control Program Support)(*8750).

**3056 REMOTE CONSOLE ATTACHMENT (#7820).** Provides attachment to the Display Console of an optional console up to 150 feet away. Maximum: One. Field Installation: Yes.

**3213 PRINTER ATTACHMENT (#7840).** To attach a 3213 Printer to the Display Console for optional hard copy. Maximum: One. Field Installation: Yes.

**TWO CHANNEL SWITCH FOR ISC (#7905).** To provide each of the two paths of an ISC with the capability of attaching to a second channel. The channels may be on the same CPU or different CPUs. Switching is under program control. Each path of the ISC can be dedicated to a single channel by means of a Configuration Switch. Maximum: One. Field Installation: Yes.  
**Prerequisites:** ISC Compatibility (#7731), or in Multiprocessing Mode.

**VIRTUAL MACHINE ASSIST (#8740).** Provides assist to VS operating systems operating under VM/370 by emulation of certain privileged operations. This function is also included in and enabled by the OS/V51 ECPS (Extended Control Program Support) (#8750). Field Installation: Yes. Limitation: This feature cannot be loaded, at IMPL time, concurrently with 1401/1440/1460, 1410/7010 Compatibility (#3950), OS/DOS Compatibility (#5450), 7070/7074 Compatibility (#7730), System/370 Extended (#7730), System/370 Extended, Add’l (#7731), or in Multiprocessing Mode. Field Installation: Yes.

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IBM 3165 PROCESSING UNIT

[The 3165 is no longer available ... features and model changes can be ordered on an "as available" basis.]

Purpose: Provides arithmetic, logic and control functions for a S/370 mdl 165.

Model I
Used with two 3360 mdl 4s in a S/370 mdl I165 (524,288 bytes).

Model J
Used with two 3360 mdl 5s in a S/370 mdl J165 (1,048,576 bytes).

Model JI
Used with two 3360 mdl 4s and two 3360 mdl 5s in a S/370 mdl J165 (1,572,864 bytes).

Model K
Used with four 3360 mdl 5s in a S/370 mdl K165 (2,097,152 bytes).

Model KJ
Used with six 3360 mdl 5s in a S/370 mdl KJ165 (3,145,728 bytes).

Highlights: Depending upon the model, can attach up to 3,145,728 bytes of 2-microsecond processor storage ... includes up to 16,384 bytes of 3,145,728 bytes of 2-microsecond processor storage ... eight byte execution units ... extensive data checking is coupled with in­

PREREQUISITES: In one operation with a specified number of

Channel(s) ... storage configuration control... writable control

to seven logical channels can be attached per CPU. Valid combi­

Limitations: High performance devices can be accommodated

limited to or greater than the channel

IBM 3165 PROCESSING UNIT

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From To J JI K KJ
I 55,300 127,300 543,600 98,500
J 22,000 38,300 93,200
JI 16,300 71,200
K 54,900

Bibliography:
GC20-0001
SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, or #9005 for 230 V.


[3] Channel Attachment: The basic 3165 has connection facilities for channels addressed 0, 1 and 2. SPECIFY: #9065 for attac­


[5] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[6] RETAIN/370: #9570 for non-use of FE DAU, #9571 for first CPU using FE DAU, #9572 for second CPU using FE DAU, or #9573 for third CPU using FE DAU. Customer must provide interface for FE DAU to the telephone line.

† PRICES: Mdl Purchase MMC
3165 I $ 37,790 $1,814,600 $2,790
J 37,900 1,819,900 2,800
JI 38,370 1,841,900 2,835
KJ 39,820 1,913,100 2,980

Plan Offering: Plan A, Additional Use Charge Rate: 10%:
Metering: Base Unit (meter on 3066) Machine Group: D
Purchase Option:55% Useful Life Category: 1 Per Call: 3 Warranty: A

SPECIAL FEATURES
BUFFER EXPANSION (#1432). Expands the basic 8,192-byte buffer to 16,384 bytes. Field Installation: Yes. Prerequisite: Buffer Expansion (#1432) on the 3067 Power and Coolant Distribution Unit mdl 1.

EMERGENCY POWER-OFF CONTROL (#3621, 3622). To pro­vide, in effect, a single Emergency Power-Off Switch in a "room" or "area" ... see "Emergency Power-Off" in "Systems" and SRL GC22-7004 for details. #3621 – to interconnect 2 emergency power-off switches ... #3622 – to interconnect up to 12 emergency power-off switches. Field Installation: Yes.

EXTENDED CHANNELS (#3850). To attach up to twelve channels, in combinations of 2860 Selector Channels, 2870 Block Multiplexer Channels, and 2880 Block Multiplexer Channels. A maximum of twelve channels or a total of seven channel frames, whichever occurs first, can be attached. The feature includes the capability of addressing channels 7 thru 11. Valid maximum channels attach­able are:

2860s – maximum 6 channels
2870s – maximum 2 channels
2880s – maximum 11 channels

Limitations: The 2860 channel addresses must be numbered one

NOTE: Up to three CPUs in the same physical location can be serviced by a single FE DAU.

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3165 Processing Unit (cont'd)  

HIGH SPEED MULTIPLY (#4520). Improves processor speed in both fixed and floating point multiply operations. Field Installation: Not recommended. Prerequisites: High Speed Multiply (#4520) on the 3066 System Console mdl 1 and on the 3067 Power and Coolant Distribution Unit mdl 1.

7070/7074 COMPATIBILITY (#7117). Provides the system with the ability to execute 7070 and 7074 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. 7070/7074 system features included are: Channels, 729 magnetic tape, 7501 Console Card Reader, and Floating Decimal Arithmetic. NOT included are: Teleprocessing equipment, disk storage, punched card I/O, printer, Hypertape, Interval Timer, and core storage addresses above 9989. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." Limitation: Cannot be installed with any other compatibility feature. Field Installation: Not recommended. Prerequisite: 7070/7074 Compatibility (#7117) on the 3066 System Console mdl 1 and on the 3067 Power and Coolant Distribution Unit mdl 1.

7080 COMPATIBILITY (#7118). Provides the system with the ability to execute 705 and 7080 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. 7080 system features included are: Channels, punched card input, typewriter, and 729 magnetic tape. NOT included are: Teleprocessing equipment, disk storage, Hypertape, and 705 units on-line with the 7080. Only the 7080 is emulated, but 705 programs can be run because the "705 mode" of the 7080 is emulated. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." Limitation: Cannot be installed with any other compatibility feature. Field Installation: Not recommended. Prerequisite: 7080 Compatibility (#7118) on the 3066 System Console mdl 1 and on the 3067 Power and Coolant Distribution Unit mdl 1.

709/7090/7094/7094 II COMPATIBILITY (#7119). Provides the system with the ability to execute 709, 7090, 7094, 7094 II instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. Included are the following features of those systems: Channels, punched card I/O, printer and 729 magnetic tape. NOT included are: Hypertape, teleprocessing equipment, direct couple, disk storages, drum storages, 1401 adapter, direct data on 7094 special and custom features. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." Limitation: Cannot be installed with any other compatibility feature. Field Installation: Not recommended. Prerequisite: 709/7090/7094/7094 II Compatibility (#7119) on the 3066 System Console mdl 1 and on the 3067 Power and Coolant Distribution Unit mdl 1.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/</th>
<th>MRC</th>
<th>Purchase</th>
<th>MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffer Expansion</td>
<td>$1,610</td>
<td>$77,160</td>
<td>$52.00</td>
<td></td>
</tr>
<tr>
<td>Emergency Power-Off Control,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>for 2 switches</td>
<td>3621</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>for up to 12 switches</td>
<td>3622</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
</tr>
<tr>
<td>Extended Channels</td>
<td>3850</td>
<td>513</td>
<td>24,640</td>
<td>66.00</td>
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<tr>
<td>High Speed Multiply</td>
<td>4520</td>
<td>2,615</td>
<td>135,150</td>
<td>104.00</td>
</tr>
<tr>
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<td>7117</td>
<td>2,530</td>
<td>140,350</td>
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<tr>
<td>7080 Compatibility</td>
<td>7118</td>
<td>2,530</td>
<td>140,350</td>
<td>155.00</td>
</tr>
<tr>
<td>709/7090/7094/7094 II Cmpt</td>
<td>7119</td>
<td>2,530</td>
<td>140,350</td>
<td>155.00</td>
</tr>
</tbody>
</table>

DYNAMIC ADDRESS TRANSLATION (Purchased Models J, K and KJ)

Purchased installed model 165s may be field converted to 165-II through installation of the Dynamic Address Translation Facility.

Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of model change to the 'II' Model involves the removal of parts which become the property of IBM."
Purpose: Provides arithmetic, logic, processor storage and control functions for a 3/370 model 168.

Models

<table>
<thead>
<tr>
<th>Bytes of Processor Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
</tr>
<tr>
<td>K</td>
</tr>
<tr>
<td>KJ</td>
</tr>
<tr>
<td>L</td>
</tr>
<tr>
<td>LJ</td>
</tr>
<tr>
<td>LK</td>
</tr>
<tr>
<td>LKJ</td>
</tr>
<tr>
<td>M</td>
</tr>
</tbody>
</table>

Highlight: Depending upon the model, can contain up to 0,388-608 bytes of monolithic processor storage ... eight byte parallel data flow ... includes up to 16,384 bytes of 80 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective cycle time of storage ... buffer storage does not increase the amount of addressable storage ... 80 nanosecond processor cycle ... double-words are four-way interleaved ... overlapped operation of instruction and execution units ... extensive data checking is coupled with increased reliability, availability and serviceability.

Standard Features: Universal instruction set ... extended precision ... one-nanosecond cycle-time clock with clock comparator ... one-nanosecond CDF timer ... dynamic address translation ... extended control mode ... program event recording ... dual channel (1888) ... additional variable field lengths instructions ... control registers, expanding the functions of PSWs ... byte-oriented operand feature ... buffer storage (8,192 bytes) ... fetch and store protection ... integral control feature ... attachment for 2860 Selector/Channel(s), 2870 Multiplexer Channel(s), and 2880 Block Multiplexer Channel(s) ... storage configuration control ... writable control storage ... command timer ... storage error checking and correction ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... clear Channel Receiver Control ... PSW perseveres in the event of a single Channel Receiver Control ... PSW persists across a power cycle ... channel (1888) ... additional variable field lengths instructions ... control registers, expanding the functions of PSWs ... byte-oriented operand feature ... buffer storage (8,192 bytes) ... fetch and store protection ... integral control feature ... attachment for 2860 Selector/Channel(s), 2870 Multiplexer Channel(s), and 2880 Block Multiplexer Channel(s) ... storage configuration control ... writable control storage ... command timer ... storage error checking and correction ... instruction retry ... compare and swap ... compare double and swap ... insert PSW key ... set PSW key from address ... clear Channel Receiver Control ... PSW perseveres in the event of a single Channel Receiver Control ... PSW persists across a power cycle.

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EMERGENCY POWER-OFF CONTROL (#3623, 3624). To provide, in effect, a single Emergency Power-Off Switch in a "room" or "area" ... see "Emergency Power-Off" in "Systems" and SRL GC22-7004 for details. #3623 -- to interconnect 2 Emergency Power-Off Switches. #3624 -- to interconnect up to 12 Emergency Power-Off Switches. Field Installation: Yes.

EXTENDED CHANNELS (#2855). To attach up to twelve channels, in combinations of 2860 Selector Channels, 2870 Multiplexer Channels and 2880 Block Multiplexer Channels. A maximum of twelve channels, or a total of seven channel frames, whichever occurs first, can be attached. The feature includes the capability of addressing channels 7 thru 11. Valid maximum channels attachable are:

- 2860s -- maximum 6 channels
- 2870s -- maximum 2 channels
- 2880s -- maximum 11 channels.

Limitations: 2860 channel addresses must be numbered one thru six. The first 2870 must be numbered zero. The second 2870 must be numbered one thru six. The 2890 channel addresses may be any number one thru eleven. If the address of the 2880 is seven thru eleven, only 2301's, 2303s, 2305's, 2311's, 2314's, 2321's, 2420s, 2311s, 3330s, 3340s, 3350s, 3420s, 3505s or 3705s may be attached. Field Installation: Yes.

HIGH SPEED MULTIPLY (#4525). Improves processor speed in both fixed and floating point multiply operations. Field Installation: Not recommended. Prerequisite: High Speed Multiply (#4525) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 2.

INTEGRATED STORAGE CONTROLS (ISC) (#4650). Provides for the attachment of 3333 modules (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mdl A2s/A2Fs when Staging Adapter for ISC (#7220) is not ordered. Additional storage is provided by attaching 3333 modules to the 3333 by attaching 3330 mdl B8s and/or 3344s to the 3340 mdl A2, or by attaching 3350 mdl B8s and/or a mdl C to the 3350 mdl A2/A2F. See DASD Configuration table below and 3333, 3330, 3340, 3350 'Machine's' pages. The ISC is organized functionally into two separate paths with up to 16 drives per path ... up to 32 drives per path when ISC Control Store Extension (#2150) is installed. Maximum: One. Field Installation: Yes. Prerequisites: Each ISC path requires a control unit position on a block multiplexer channel. Specify: The following applies only when Staging Adapter for ISC (#7220) is not ordered:

The available combinations of storage devices that can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the Required DASD Feature(s) are installed. Based on the DASD, and the Special Features listed below being ordered for them, order the Required DASD Feature(s). Note: The selected "Required DASD Feature(s)" applies to both ISC paths. Within this constraint the DASD Configuration on one ISC path may be different from that on the other ISC path.

<table>
<thead>
<tr>
<th>DASD CONFIGURATION</th>
<th>3330 Only</th>
<th>3340 Only</th>
<th>3330/3340 Only</th>
<th>3330/3340/3350 Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>3334 only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3340 only</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3350 only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3333, 3340 only</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3333, 3340, 3350</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3333, 3340, 3350.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ISC (4650) WITH ONE CHANNEL OR TWO CHANNEL SWITCH (#7305).

<table>
<thead>
<tr>
<th>DASD CONFIGURATION</th>
<th>Required DASD Feature(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3334</td>
<td>X</td>
</tr>
<tr>
<td>3340</td>
<td>X</td>
</tr>
<tr>
<td>3350</td>
<td>X</td>
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<tr>
<td>3333, 3340, 3350.4</td>
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<td>3333, 3340, 3350.6</td>
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<td>3333, 3340, 3350.7</td>
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<td>3333, 3340, 3350.8</td>
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<td>3333, 3340, 3350.10</td>
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<td>3333, 3340, 3350.11</td>
<td>X</td>
</tr>
<tr>
<td>3333, 3340, 3350.12</td>
<td>X</td>
</tr>
</tbody>
</table>

ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

* Any change to an installed DASD Configuration requires an M.S. ONLY if the new configuration indicates that a different Specify and/or Special Feature is required. The M.S. must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.

** ISC Control Store Extension (#2150) is prerequisite. Specify: #9317, each path of the ISC requires 32 contiguous device addresses regardless of the number of drives attached.

† Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the 3333-2 uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdl A2z on the first and third strings may attach up to three 3340 mdl B1, B2s, and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2s. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.

++ Expanded Control Store (#2151), Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group each ISC path uses 8 or 16 or 32 or 64 device addresses depending upon the respective DASD configuration installed and whether any 3350 drive is in 3330-1 compatibility mode.

REGRESS EXPANSION (#6111). Provides additional registers for microprogram use on the ISC ... see "Specify" under Integrated Storage Control (4650) to determine when required. Field Installation: Yes. Maximum: One.

REMOTE SWITCH ATTACHMENT (#6140). To attach the Two Channel Switch for ISC (#7905) to the configuration control panel on the 3068 Multisystem Communication Unit. Maximum: One. Field Installation: Yes. Prerequisite: Two Channel Switch for ISC (#7905).

7070/7074 COMPATIBILITY (#7127). Provides the system with the ability to execute 7070 and 7074 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. 7070/7074 system features included are: Channels, 729 magnetic tape, 7501 Console

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3168 Processing Unit (cont'd)

Card Reader, and Floating Point Decimal Arithmetic. NOT included are: Teleprocessing equipment, disk storage, punched card I/O, printer, Hypertape, Interval Timer, and core storage addresses above 9989. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." Limitations: Cannot be installed with any other compatibility feature. Cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730). Field Installation is not recommended. Prerequisites: 7070/7074 Compatibility (#7127) on the 3066 System Console md 2 and on the 3067 Power and Coolant Distribution Unit md 2.

7080 COMPATIBILITY (#7128). Provides the system with the ability to execute 705 and 7080 instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. System 7050 system features included are: Channels, punched card I/O, printer, and 729 magnetic tape. NOT included are: Hypertape, teleprocessing equipment, disk storage, Hypertape, and 705 units on-line with the 7080. Only the 7080 is emulated, but 705 programs can be run because the "705 mode" of the 7080 is emulated. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." Limitations: Cannot be installed with any other compatibility feature. Cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730). Field Installation: Not recommended. Prerequisites: 7080 Compatibility (#7128) on the 3066 System Console md 2 and on the 3067 Power and Coolant Distribution Unit md 2.

7070/7090/7094/7094 II COMPATIBILITY (#7129). Provides the system with the ability to execute 709, 7090, 7094 and 7094 II instructions. This capability is integrated under OS and emulated programs operate as processing programs under MFT and MVT. Included are the following features of those systems: Channels, punched card I/O, printer, and 729 magnetic tape. NOT included are: Hypertape, teleprocessing equipment, disk storage, Hypertape, and 705 units on-line with the 7080. Only the 7080 is emulated, but 705 programs can be run because the "705 mode" of the 7080 is emulated. For a detailed explanation of system requirements with this feature, see "Compatibility Features" under S/370 in "Systems." Limitations: Cannot be installed with any other compatibility feature. Cannot be loaded, at IMPL time, concurrently with System/370 Extended (#7730). Field Installation: Not recommended. Prerequisites: 709/7090/7094/7094 II Compatibility (#7129) on the 3066 System Console md 2 and on the 3067 Power and Coolant Distribution Unit md 2.

STAGING ADAPTER FOR ISC (#7220). Enables each path of the ISC to attach a maximum of four 3333 Mds 1 and 11 and/or 3350 Mdl 2/A2/2f's with associated 3330 Mds 1, 2, and 11 and 3350 Mdl 2/B2/2f and C2/C2f, for a maximum of 32 drives per path. See 3333, 3350 and 3350 for additional information. Also see note on M3333 pages for feature changes required when 3333's are retained for use with a 3651. Provides up to 64 virtual 3333 addresses for each channel interface on each path of the ISC. Provides for the attachment of up to four Data Recording Controls in one or two 3651 Mass Storage Facilities to each path of the ISC. Maximum: One. Field Installation: Yes. Prerequisites: Include removal of any of the following which are installed: #9190, 9313, 9314, 9315, 9317, 9318. Prerequisites: Integrated Storage Controllers (#4650) and ISC Control Store Extension (#2150). For 3350 attachment the additional prerequisites are Expanded Control Store (#2151), Register Expansion (#4611), and ISC/SA Control Store Additional (#2152). Limitations: If String Switch (#8150) is installed on a 3333, see rewrite for this feature on 3333 "Machines" page. 3340 drives cannot be attached to the ISC when #7220 is installed. 3350 drives attached to the ISC when #7220 is installed cannot be used as staging drives and must be designated as real in 3530 native mode only. 3350 devices may not be mixed with other type devices in the same string. Specify: #9319 (Staging Adapter 3333/3350/3350).

SYSTEM/370 EXTENDED (#7730). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/Systems Extensions Program Product. Field Installation: Yes. Prerequisites: RPO Performance Improvements. RPO APU Attach, is also required if the 3166 is used with a 3062. Required on each processor in an MP system and on a 3168 with RPOs. System/370 Extended (#7730) is also required on the 3062 Attached Processing Unit in an AP system. Limitation: This feature cannot be loaded, at IMPL time, concurrently with 7070/7074 Compatibility (#7127), 7090 Compatibility (#7128), or 709/7090/7094/7094 II Compatibility (#7129).

TWO CHANNEL SWITCH FOR ISC (#7905). To provide each of the two paths of an ISC with the capability of attaching to a second channel. The channels may be on the same CPU or different CPUs. Switching is under program control. Each path of the ISC can be dedicated to a single channel by means of a Configuration Switch. Maximum: One. Field Installation: Yes. Prerequisites: An available control unit position and eight unshared subchannels on a system block multiplexer channel. For S/370 mdls 165, 168, 195, see 2860 Block Multiplexer Channel. For S/370 mdls 135, 135-3, 138, 145, 146-3, 149, 155, 168, 3031, 3032 and 3033, see 3135, 3135-3, 3138, 3145, 3145-3, 3148 3155, 3158, 3031, 3032 or 3033 respectively. For 4300 Processors, see 4341.

M 3168.3
Jul 79

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IBM 3168-3 PROCESSING UNIT

Purpose: Provides arithmetic, logic, processor storage and control functions for a S/370 mdl 168.

Models | Bytes of Processor Storage |
--------|--------------------------|
U31     | M31 A31 1,048,576        |
U32     | M32 A32 2,097,152        |
U33     | M33 A33 3,145,726        |
U34     | M34 A34 4,194,304        |
U35     | M35 A35 5,242,880        |
U36     | M36 A36 6,291,456        |
U37     | M37 A37 7,340,032        |
U38     | M38 A38 8,388,603        |

Highlights: Depending upon the model, can contain up to 8,388,603 bytes of monolithic processor storage, eight byte parallel data flow includes up to 32,768 bytes of 80 nanosecond cycle buffer storage which is transparent to the program and significantly reduces the effective cycle time of storage. Buffer storage does not increase the amount of addressable storage, 80 nanosecond cycle storage doubles-words are four-way interleaved, overlapped operation of instruction and execution units, extensive data checking is coupled with increased reliability, availability and serviceability. Improved instruction execution times over the 3168, improved interrupt execution times over the 3168, improved availability and serviceability through a service processor. Attatched Processing by attachment of a 3062 Attached Processing Unit mdl 1.

Standard Features: Universal instruction set extended precision one-microsecond CPU timer, dynamic address translation extended control mode program event recording, dual channel I/O bus, additional variable field length instructions control registers, expanding the functions of PSWs, byte-oriented operand features buffer storage (32,768 bytes), fetch and store protection, direct control feature attachment for 2860 Selector Channel(s), 2870 Multiplexer Channel(s), and 2880 Block Multiplexer Channel(s), storage configuration control writeable storage control interval timer, storage error checking and correction instruction retry, compare and swap, insert PSW key, set PSW key from address channel, 2870 C/I/O Channel, Multichannel, and four additional instructions on the M models: signal processor, set prefix, store prefix, store CPU address.

Channels: Separate channels facilitate maximum overlap with processing. Channel speeds of 1.5 million bytes/second are standard and up to 3 million bytes/second with Two Byte Interface (#7850, 7851) on the 2860 Block Multiplexer Channel. Up to seven logical channels can be attached per CPU. Valid combinations include: (a) One 2870 plus up to six channels of 2860s and 2880s, (b) Two 2870s plus up to five channels of 2860s and 2880s, (c) Up to 2870s attached, only up to six channels, 2860s and/or 2880s, can be attached per CPU. See 2860, 2870, 2880.

With the addition of Extended Channels (#3855), up to twelve channels can be attached, for valid combinations, see "Special Features." Depending upon data rates, all channels, including the Selector Subchannels and basic multiplexer channel of the 2870 can operate concurrently. Each selector or block multiplexer channel can control up to eight control units. The basic multiplexer channel and each Selector Subchannel of the 2870 controls up to eight control units. If one 2841 is attached, no other control unit can be attached to that Selector Subchannel...

PREREQUISITES: Each 3168-3 requires [1] At least one selector channel (2860, block multiplexer channel (2880), or a 2870 with at least one Selector Subchannel ... [2] One 3066 System Console mdl 1, or 3067 Power and Coolant Distribution Unit mdl 3 ... [4] An appropriate 415Hz power input. Customer-supplied chilled water is required for cooling the system. See S/370 Installation Manual - Physical Planning, GC22-7004.


An MP model requires two M CPUs of any size. Each M CPU model requires Multiprocessing (#5050) on both the 3066 mdl 2 and the 3067 mdl 3. The 3068 Multisystem Communication Unit is required for each one or two processor M system. If either of the processors is a mdl MPS, MP6, MP7, MPS, M35, M36, M37 or M38, Extended Storage Attachment (#3850) is required on the 3068.

Bibliography: GC20-0001

* Purchase Option is 50% under Term Lease Plan (TLP)

† RETAIN may be used with the 3168-3, however it is not required. Remote service is a customer option where it is available. When the option is selected, the customer must provide to the telephone lines required for the service processor remote link capability. The customer must also arrange the connection of the telephone interface cable provided by IBM to the telephone network.

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9906 for 230 V.

[2] Motor Generator Set and Starter: If desired, see M 1000 pages for ordering instructions and prices.

[3] Channel Attachment: The basic 3168-3 has connection facilities for channels addressed 0-6. For channels 7-11, see Extended Channels (#3855).

[4] Emergency Power-Off Control: May be required, see "Special Features" and S/370 Installation Manual - Physical Planning, GC22-7004 for details. If two processors are installeed and the 3602 is to be added and emergency power off ability is required on the systems, then the expanded Emergency Power-Off Control (#3624) should be ordered.

[5] Color: #9941 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

3168-3 Processing Unit (cont'd)

**M31 M32 M33 M34 M35 M36 M37 M38**

- M31 $75,000
- M32 $75,000
- M33 $77,000
- M34 $90,000
- M35 $75,000
- M36 $75,000
- A32 A33 A34 A35 A36 A37 A38
- A31 $75,000
- A32 $75,000
- A33 $77,000
- A34 $90,000
- A35 $75,000
- A36 $75,000
- A37 $75,000

**NOTES:**

1. There are no additional installation charges over the above model conversion and model upgrade prices.
2. The above model conversion and model upgrades are field installable.
3. Planning for Model Conversions and Model Upgrades: When a customer requires model (storage) upgrades in addition to a model conversion, the changes must not be consolidated into a single. Also, model (storage) upgrades should be ordered individually in one-model increments.
4. Field change from 3168-3 to a 3168 is not recommended.
5. Customer price quotations and customer order acknowledgement letters for purchase must state: "All parts which are removed from purchased processors to accomplish a model change to and from the A series become the property of IBM."

**SPECIAL FEATURES**

**ISC CONTROL STORE EXTENSION (#2150).** Provides additional control store for microprogram use on the ISC (#4650). When the Staging Adapter for ISC (#7220) is NOT ordered, see "Specify" under Integrated Storage Controls (#4650) to determine when required. **Note:** When #7220 IS ordered, #2150 is prerequisite. **Maximum:** One. **Field Installation:** Yes.

**EXPANDED CONTROL STORE (#2151).** Provides additional control storage for microprogram use on the ISC...see "Specify" under Integrated Storage Control (#4650) to determine when required. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ISC Control Store Extension (#2150), and Register Expansion (#6111).

**ISC/SA CONTROL STORE ADDITIONAL (#2152).** Provides additional control store for microprogram use on ISC. Required if 3350 DASD is attached with Staging Adapter for ISC (#7220). **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** ISC Control Store Extension (#2150), and Staging Adapter for ISC (#7220).

**EMERGENCY POWER-OFF CONTROL (#3623, 3624).** To provide, in effect, a single Emergency Power-Off Switch in a "room" or "area"...see "Emergency Power-Off" in "Systems" and SRL GC22-7004 for details. #3623 -- to interconnect 2 Emergency Power-Off Switches...#3624 -- to interconnect up to 12 Emergency Power-Off Switches. **Field Installation:** Yes.

**EXTENDED CHANNELS (#3855).** To attach up to twelve channels, in combinations of 2860 Selector Channels, 2670 Multiplexer Channels and 2860 Block Multiplexer Channels. A maximum of twelve channels, or a total of seven channel frames, whichever occurs first, can be attached. The feature includes the capability of addressing channels 7 thru 11. Valid maximum channels attachable are: 2860s -- maximum 6 channels 2870s -- maximum 2 channels 2880s -- maximum 11 channels. **Limitations:** 2860 channel addresses must be numbered one thru six. The first 2870 must be numbered zero. The second 2870 must be numbered one thru six. The 2880 channel addresses may be any number one thru eleven. If the address of the 2880 is seven thru eleven, only 2881s, 2889s, 2905s, 2911s, 2914s, 2921s, 2420s, 3211s, 3330s, 3340s, 3342os, 3240s, 3050s or 3705s may be attached. **Field Installation:** Yes.

**HIGH SPEED MULTIPLY (#4525).** Improves processor speed in both fixed and floating point multiply operations. **Field Installation:** Not recommended. **Prerequisites:** High Speed Multiply (#4525) on the 3066 System Console mdl 2 and on the 3067 Power and Coolant Distribution Unit mdl 3 and/or mdl 5. Specify A mids only) #4440 for #4525 on the 3062 APU, or #9441 for no #4525 on the 3062 APU.

**INTEGRATED STORAGE CONTROLS (ISC) (#4650).** Provides for the attachment of 3333s (mdls 1 and/or 11) and/or 3340 mdl A2s and/or 3350 mld A2s/A2Fs when Staging Adapter for ISC (#7220) is NOT ordered. Additional storage is provided by attaching 3330 modules to the 3333 or by attaching 3340 mdl B's and/or 3344s to the 33440 mdl A2, or by attaching 3360 mdl B's and/or a mdl C to the 3350 mdl A2/A2F...see DASD Configuration table below and 3333, 3330, 3340, 3350 "Machines" pages. The ISC is organized functionally into two separate paths with up to 16 drives per path...see #3200 paths when ISC Control Store Extension (#2150) is installed. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Each ISC path requires a control unit position on a block multiplexer channel. **Specify:** The following applies only when Staging Adapter for ISC (#7220) is NOT ordered.

The available combinations of storage devices that can be attached are shown in the table below. One, two or three Xs in a vertical column indicate the type of machine(s) listed under DASD Configuration which can be attached when the "Required DASD Specify Feature(s)" are installed. Based on the DASD, and the Special Features listed below being ordered for them, order the Required DASD Specify Feature(s). **Note:** The Required DASD Specify Feature(s) applies to both ISC paths. Within this constraint the DASD Configuration on one ISC path may be different from that on the other path.

**ISC (#4650) WITH ONE CHANNEL OR WITH TWO CHANNEL SWITCH (#7905)

<table>
<thead>
<tr>
<th>DASD Configuration</th>
<th>Required DASD Specify Feature(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3333</td>
<td>x</td>
</tr>
<tr>
<td>3333 and/or 3340</td>
<td>x</td>
</tr>
<tr>
<td>3350</td>
<td>x</td>
</tr>
</tbody>
</table>

ISC diskette-only specify feature. No fee when ordered at time of manufacture or with interchangeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.

* Any change to an installed DASD Configuration requires an MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Feature(s) not previously installed AND removal of any not listed as required for the new configuration.

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3168-3 Processing Unit (cont'd)

** ISC Control Store Extension (#2150) is prerequisite. With #9315, each path of the ISC requires a contiguous and dedicated address regardless of the number of drives attached.

+ Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the 3330-2 uses 64 contiguous device addresses respectively of the number of drives attached. The 3340 mdls A2 on the first and system. Limitation: This feature cannot be used as staging drives and must be designated as real in 3350 native mode only. 3350 devices may not be used with other type devices in the same string. **Specifying #9319 (Staging Adapter 3335/3330/3350) is also required on the 3062 Attached Processing Unit in an AP system.**

**SYSTEM/370 EXTENDED (##7730). Provides S/370 Extended facilities which are a prerequisite for operation with the MVS/System Extensions Program Product. Field Installation: Yes. Prerequisites: Required on each processor in an MP system, and on the A-series processor in an AP system. System/370 Extended (##7730) is also required on the 3062 Attached Processing Unit in an AP system. Limitation: This feature cannot be load at IPL time, concurrently with 7070/7074 Compatibility (##7127), 7080 Compatibility (##7128), or 7090/7094/7094 II Compatibility (##7129).**

3213 INTEGRATED PRINTER ATTACHMENT (##7850). Provides the interface needed to attach the optional 3213 Printer to the service processor on the 3168-3. The 3213 can be used to print error data captured and stored in the service processor. The printer does not attach to the channel interface. **Field Installation: Yes.**

+ **TWO CHANNEL SWITCH FOR ISC (##7905). To provide each of the two paths of an ISC with the capability of attaching to a second channel. The channels may be on the same CPU or different CPUs. Switching is under program control. Each path of the ISC can be dedicated to a single channel by means of a Configuration Switch. Maximum: One. Field Installation: Yes. Prerequisites: An available control unit position and eight unshared subchannels on a system bus. System/370 is prerequisite. With #9315, each path of the ISC may be loaded, at IPL time, concurrently with 7070/7074 Compatibility (##7127), 7080 Compatibility (##7128), or 7090/7094/7094 II Compatibility (##7129).**
**3195 PROCESSING UNIT**

*No Longer Available*

**Purpose:** Provides arithmetic, logic, control and processing storage for a S/360 or S/370 mdl 195.

**Models:**

For S/360:
- Model J: 1,048,576 bytes
- Model K: 2,097,152 bytes
- Model KJ: 3,145,728 bytes
- Model L: 4,194,304 bytes

For S/370:
- Model J: 1,048,576 bytes
- Model K: 2,097,152 bytes
- Model KJ: 3,145,728 bytes
- Model L: 4,194,304 bytes

**Highlights:**

- For the mdl 195 with the following features: alphameric keyboard, 8K buffer (4K is maintenance only), character generator, light pen, and OCP.
- Depending upon the model, includes up to 4,194,304 bytes with a 756-nanosecond cycle time ...
- byte parallel data flow...

**Purpose:**

- Models: For concurrent operations in multiple execution units and with the age for a ...
- Highlights: ... not increase the amount of addressable storage...
- Because of the high performance emphasis, there are operational differences from other S/360 and S/370 models.

**Features:**

- [1] The quotient of a floating point divide operation may differ in the mdl 195 from that of other models by an amount equal to one bit in the low order fraction position. For zero remainders, however, the results will be identical.
- [2] Several program interruptions that should, according to the IBM S/360 Principles of Operation, store a non-zero Instruction-Length Code (ILC) are imprecise in the mdl 195 and store a zero ILC. This zero ILC indicates that the address of the instruction causing the interruption has not been retained. When precise program interruptions occur, the interruption code portion of the current PSW is used in a special way.
- [3] The mdl 195 is capable of executing processor stores out of sequence. Logical consistency is maintained among processor fetches and stores including the beginning and ending I/E operations. However, if a program is to modify a string of CCWs while they are being used by the channel, then steps must be taken to arrange the program so that the stores are made in sequence. This is described in the Model 195 Functional Characteristics (GA22-6943).
- [4] If a floating point underflow occurs, the result will be replaced by all zeros. If an overflow occurs, the result will be replaced by all ones with the correct sign. For those instructions that change the condition code, the code is 1 or 2 for overflow, and 0 for underflow.

**Special Features:**

- The following special feature is on an “As Available” basis for field installation.

**EXTENDED CHANNELS (#3851):**

Provides for attachment of up to fourteen channels, combinations of 2860 Selector Channels, 2870 Multiplier Channels, and 2880 Block Multiplexer Channels. A maximum of fourteen channels or a total of eight channel frames, whichever occurs first, can be attached. Valid maximum combinations of channels are:

- 2860s - maximum of 2 (6 channels)
- 2870s - maximum of 2 (2 channels)
- 2880s - maximum of 7 (13 channels)

**Limitations:**

The 2860 channel addresses must be numbered one thru six. The first 2870 channel address must be number zero, the second must be any number one thru six. The 2860 channel addresses may be any number one thru thirteen. If the address of the 2880 is selected, any 2860s, only 2301s, 2303s, 2305s, 2311s, 2314s, 2321s, 2420s, 3211s, or 3330s may be attached.

**Field Installation:**

*Yes. Prerequisites: On 2150 -- #9175 if Operator Control Panel, First (2860). On 2500 -- #9176 if Operator Control Panel, Second (2880). To interconnect up to six Emergency Power-Off Switches.*

**NOTE:**

Up to three CPUs in the same physical location can be serviced by a single FE DAU.
3195 Processing Unit  (cont'd)
stalled. On 2250 -- #9175 if Operator Control Panel, First
(#5475) is to be installed on 2250 ... #9176 if Operator Control
Panel, Second (#5476) is to be installed.
IBM 3203 PRINTER

Purpose: Printer output unit for all virtual storage S/370s, 3031, 3032, 3033, 4331 and 4341 Processors, and the 3777 Communication Terminal.

Model 1 -- 600 lpm ... native attachment on S/370 mdls 115, 125 only.
Model 2 -- 1200 lpm ... native attachment on S/370 mdls 115, 125 only.
Model 3 -- 1000 lpm ... for use with a 3777 Communication Terminal.
Model 4 -- 1200 lpm ... native attachment on S/370 mdls 138, 148 only.
Model 5 -- 1200 lpm ... channel attachment to a virtual storage S/370, a 3031, 3032, 3033, 4331 or 4341 Processor.

All rated speeds are based on a 48 character set.

Highlights: 132 print positions are standard. Horizontal spacing is buffer. The carriage is a of graphics sets from the cartridge.

Under operator speeds vary depending upon frequency of character repetition on the cartridge. Producing better copies.

Maximum forms dimensions are: inches. Minimum forms dimensions are: maximum width is recommended. For the second 3203 mdl 4 on S/370 mdls 138 or mdl 148.

First 3203 Model 5 Installed: #190 ... required on the first rental 3203 mdl 5 to be installed at a customer installation. This provides a tool kit required for CE maintenance. Additional tool kits are available if required for a multiple machine installation. When installed rental 3203 mdl 5s are purchased, a tool kit can be ordered no-charge for each printer requiring one.

OCR: When OCR ribbons are used for either OCR printing or other applications, specify #9486. FIELD INSTALLATION Yes.

Model Changes: Can be made in the field between models 1, 2, 4 and 5.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges.)

From Model 1 to Model 2 ..... $16,000
From Model 2 to Model 4 ..... $9,750
From Model 4 to Model 5 ..... $19,500

Model upgrades of mdls 1 to 4, 1 to 5, or 2 to 5 require multiple orders. Prices are additive.

SPECIAL FEATURES

SPEED ENHANCEMENT (#6360). Model 3 Only Provides capability to operate the 3203 mdl 3 at 1200 lpm. Maximum: One. Prerequisite: Print Speed Enhancement (#5595) on the 3777. Field installation: Yes.

IBM 3210 CONSOLE PRINTER-KEYBOARD

Purpose: Selectric® console typewriter for use as an input (keyboard) and output (printer) unit for a S/370 mdl 135, 135-3, 145, 145-3 or 155.

Model 1 For mounting on the console table reading board.
Model 2 For remote use ... not available for the S/370 mdl 135, 135-3, 138.

Model Changes: Not recommended for field installation.

Highlights: Both models consist of a Selectric keyboard printer. Model 1 is to be mounted on the 3135, 3135-3, 3145, 3145-3 or 3155 reading board. Model 2 is supplied with a stand which can be located up to 75 feet from the processor. For the mdl 1, a

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3210 Console Printer-Keyboard

forms rack is supplied with the system. A forms rack is standard with the mdl 2.

In both models, the keyboard and printer operate independently under program control. The general facilities provided are: direct data entry into the system, printed output from the system, and switches and lights for system control.

The keyboard on both models is similar to other Selectric type-writers. However, it provides only those functions useful and necessary in a system console. Functions such as tab, sets and clear, backspace, ribbon shift and end-of-line bell are not included. On model 1, keys and lights are provided so that the operator can "display and alter" processor storage and system control information.

The printer for both models has an 88-character data set and a 125-character print line. It operates at a rated speed of 15.5 characters/second, has a stationary carriage, and an interchangeable print element. A 15-inch carriage provides a 12-1/2" writing line at 10 characters/inch. A 6 lines/inch pin feed platen (13-1/8" pin-to-pin) is standard. A maximum of an original and five carbon copies can be prepared, depending upon paper, carbon quality and thickness. A Data Font 1, dual case printing element is provided ... see page 1C 22 in "Type Catalog" section for character layout.

Limitation: One of each model can be attached to a system ... Models 1 cannot be attached if a 3215 Console Printer-Keyboard is installed.

PREREQUISITES: Model 1 -- requires a 3210 Mdl 1 Adapter (#7844) on the 3135, 3135-3, 3145, 3145-3 or 3155 Processing Unit. Model 2 -- requires a 3210 Mdl 2 Adapter (#7845) on the 3145, 3145-3 or 3155 Processing Unit.

Bibliography: S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ...

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IBM 3211 PRINTER

Purpose: Printed output unit for a S/360 mdl 22, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195, any of 48 character sets. Horizontal spacing is 10 characters per inch. Vertical spacing is 6 or 8 lines per inch under program control. Continuous marginally punched form spacing and skipping is controlled by a Forms Control Buffer, a standard feature of the 3811. This program controlled buffer allows skipping at 30 inches per second with a high speed skip of 90 inches per second after 7 lines have passed. Maximum form length is 22.5 inches at 8 lines per inch and 24 inches at 6 lines per inch. Form width may vary from 3.5 inches to 18.75 inches. Minimum form length is 3 inches. A pair of guides may be purchased for use with forms having a fandold depth greater than 18" ...

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IBM 3213 CONSOLE PRINTER

Purpose: Printer for use with display console on a S/370 model 158, or with the service processor on the 3168-3.

Highlights: Prints serially at a maximum rate of 85 cps. The maximum print line is 126 print positions at 10 characters/inch. Matrix characters are formed by 7 vertical wires, each printing a dot in up to 4 of 7 possible horizontal positions. Prints the 88 graphics of PTTC/EBCD.

The unit has a pin feed platen. One size should be specified, 120 positions, or 126 positions... see "Specify." Marginally punched continuous forms paper can be fed. Maximum forms width is 13-1/8" (hole-to-hole). Up to six part forms can be printed with a maximum thickness of .018". Forms length can be 3" to 14" in increments of 1/6". Line spacing is 6 lines/inch. A Line Feed Select lever allows manual selection of single or double spacing. Refer to SRL GA24-3488 for forms design considerations and limitations.

Basic functions include fixed margins (dependent on platen size ordered), space, carriage return, line feed, and new line. An optional forms stand is available... see "Special Features."

PREREQUISITE: A 3213 Printer Adapter (#7840) on the 3158 Processing Unit, or a 3213 Integrated Printer Attachment (#7850) on the 3168-3 Processing Unit.

Supplies: A black ribbon, IBM Part No. 1136970 or equivalent, is recommended.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V... must be consistent with system voltage.

[2] Pin Feed Platen: #9167 for 120 print positions (12-1/2" hole-to-hole), or #9167 for 126 print positions (13-1/8" hole-to-hole). NOTE: Do not order #9167 unless paper is available in your area.

PRICES:

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<tr>
<th>Mdl</th>
<th>MAC/ MRC</th>
<th>MLC</th>
<th>Purchase MMC</th>
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<tbody>
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<td>$235</td>
<td>$214</td>
<td>$7,635</td>
<td>105</td>
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</table>

Plan Offering: Plan B or Term Lease Plan

Maintenance: B

Warranty: B

Purchase Option: 40% Per Call: 3

Useful Life Category: 2

Upper Limit Percent: 5%

Termination Charge Months: 6 Termination Charge Percent: 25%

SPECIAL FEATURES

FORMS STAND STACKER (#4450). [Purchase only] Permits placement of continuous forms (out of carton) on the stand above floor level and provides for continuous forms stacking and printing.

Field Installation: Yes.

Special Feature Prices:

<table>
<thead>
<tr>
<th>MAC/ MRC</th>
<th>Purchase MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>#4450</td>
<td>N/A $ 54</td>
</tr>
</tbody>
</table>

IBM 3216 INTERCHANGEABLE TRAIN CARTRIDGE

Purpose: A cartridge and print train which provides interchangeability of type fonts for the 3211 Printer.

Highlights: At least one 3216 is required when running a 3211 Printer. OCR type styles are available.

Interchangeability: When multiple 3216s are available, they can be interchanged by the operator, providing flexibility for printing different type fonts, type styles or character arrangements. Character sets up to 254 characters can be required for unique requirements.

PREREQUISITE: The 3216 functions only when mounted in a 3211 Printer.

Bibliography: S/360 - GC20-0360, S/370 - GC20-0001

SPECIFY: [1] Print Train Arrangement... see "Type Catalog" for characters in each standard arrangement and feature #s to be specified.

[2] Storage Container: #9668, if needed for the 3216... recommended for storage use, when multiple 3216s are ordered for a single 3211.

PRICES:

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MAC/ MRC</th>
<th>Purchase MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3216</td>
<td>$411</td>
<td>$10,530</td>
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</tbody>
</table>

Plan Offering: Plan B

Maintenance: D

Warranty: B

Per Call: 3

Purchase Option: 30%

Useful Life Category: 2

IBM 3215 CONSOLE PRINTER-KEYBOARD

Purpose: Printer-Keyboard for console I/O in a S/370 model 135, 135-3, 145, 145-3 or 155.

Highlights: Prints serially at a maximum rate of 85 cps. The maximum print line is 126 print positions at 10 characters/inch spacing. Matrix characters are formed by 7 vertical wires, each printing a dot in up to 4 of 7 possible horizontal positions. Prints the 88 graphics of PTTC/EBCD similar to the graphics shown on page TC 22 for the 3210 mdl 1 and 2.

The unit has a pin feed platen, one size should be specified, 120 positions, or 126 positions... see "Specify." Marginally punched continuous forms paper can be fed. Maximum forms width is 13-1/8" (hole-to-hole). Up to six part forms can be printed with a maximum thickness of .018". Forms length can be 3" to 14" in increments of 1/6". Line spacing is 6 lines/inch. A Line Feed Select lever allows manual selection of single or double spacing.

† Purchase Option is 50% under Term Lease Plan (TLP)

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IBM 3251 DISPLAY STATION

Purpose: An interactive computer graphics display station for the display of graphical and alphanumeric data generated within a S/370 or 4300 Processor. The display station may have attachments for operator interaction with the displayed picture, thereby providing highly interactive man-machine communication.

The 3251 requires a 3255 Display Control and a 3258 Control Unit. It may be used in multiple display station configurations for Computer Aided Design, Computer Aided Manufacturing and scientific analysis applications. It is particularly suited to those applications requiring a high interaction rate and the display of pictures containing a high vector and character content.

Up to two 3251s can be attached to each 3255; the first 3251 must be sited adjacent to the 3255, the second 3251 may be located up to 15.2 m (50 feet) from the 3255. Up to four 3255s may be attached to each channel attached 3255; each 3255 may be located up to 1525 m (5000 feet) from the 3258.

Highlights:
- A free standing, tabletop mounted, interactive computer graphics display station for the display of graphical and alphanumeric data generated within a S/370 or 4300 Processor.
- A 534 mm (21 inch) diagonal, directed beam, display unit having a 305 mm x 305 mm (12" x 12") viewing area.
- Vector graphics - straight lines may be displayed between any of the 1024 x 1024 addressable positions on the screen. Display buffer orders are provided which enable the expression of vector endpoints coordinates in absolute form or incrementally, relative to the current beam position.
- Graphical data can be displayed as a series of points (Point Plot orders), or in one of four line types: solid, dotted, dashed, dot-dashed (Vector Plot orders).
- Improved quality character set comprising both upper and lower case can be displayed either horizontally or vertically (90 degrees counterclockwise) in any of four sizes.
- Eight programmable intensities (including blank) for points, vectors or characters; the three brightest levels can be detected by the light pen.
- Audible and visible (blink) alerts which can be programmed to notify the display station operator of exceptional conditions.
- Free standing Alphanumeric Keyboard - see Special Features.
- Backlighted 32 key Program Function Keyboard - see Special Features.
- Light Pen - see Special Features.

The 3250 is generally upward compatible from the IBM 2250 Graphics Display Station and appropriate programs written for the 3250 can be used on the 3250 without change, with minor exceptions:
- 3250 supports one cursor per display station.
- Some previously undefined orders have a defined function in the 3250.
- Lower character case are displayed as lower case by the 3250.
- 3250 does not have Program Function Keyboard overlay sense switches.
- 3250 shares display buffers among a maximum of two display stations.
- Undefined characters in 3250 text strings are treated as blanks or nulls.

Software support via Graphic Programming Services (GPS), (which includes the Graphic Access Method (GAM), and Graphic Subroutine Package (GSP). These are SCP programs running under OS/VS1 and OS/VS2 operating systems.

Human Factors: The 3251 has an antiglare screen designed to reduce reflection in office lighting. Brightness and focus controls are provided for operator adjustment to best suit ambient lighting. Program Function Keyboard angled for operator convenience ... see Special Features. Low profile Alphanumeric Keyboard has separators to help prevent accidental striking of control keys. It also has a palm rest on the keyboard ... see Special Features. The keyboards are free standing to allow placement to suit the operator.

Input-Output Flexibility:
- Alphanumeric Keyboard with upper and lower case input, Cancel, Jump, Backspace, and Enter function keys, continuous-type key ... see Special Features. Input assisted by provision of visible cursor on the screen and display buffer orders enabling definition of fields either protected or unprotected from operator input.
- Program Function Keyboard with 32 backlit keys. Lighting of keys is under S/370 or 4300 Processor program control ... see Special Features.
- Light Pen; hand held, pen-like device for interaction with the displayed image ... see Special Features.

Performance: Basic performance characteristics:
- Vector draw speed of 8890 m (350,000 inches) per second, i.e., 34 microseconds for 305 mm (12 inch) screen deflection.
- Vector move speed of 22 microseconds for 305 mm (12 inch) screen deflection.
- Character draw average speed of 4.2 microseconds for a BASIC size character (height 4.1 mm (0.16 inches)).

The amount of data displayable depends on many factors, including the mix of vectors and characters. With one 3251 attached to a 3255, then at 40 cycles per second regeneration rate, at least the following can be displayed:

Either - 9,500 Incremental vectors of 9.5 mm (0.375 inches), or - 2,150 Absolute vectors of 76 mm (3 inches), or - 5,250 BASIC size characters (average mix).

With two 3251s attached to a 3255 the performance is slightly less than half that shown above.

When the 3251 displays images at a regeneration rate of 40 cycles per second the picture quality is superior to that of images displayed by the IBM 2250 Display Unit model 3 at 40 cycles per second. As the picture content is reduced the regeneration rate increases up to a maximum of 46 cycles per second.

The High-Speed Link transfers data between the 3258 Control Unit and the 3255 Display Control at a maximum rate of 1M bits per second.

PREREQUISITES: A 3255 Display Control adjacent or up to 15.2m (50 feet) away ... maximum of two 3251s per 3255 ... see 3255.

Bibliography: GC20-0001

Specify: [1] Power (AC, 1-phase, 3 wire, 60 Hz): Locking Plug – $9880 for 115 V, $9884 for 208 V, $9886 for 230 V. Non-lock plug – $9881 for 115 V, $9885 for 208 V, $9887 for 230 V. A 3251 must be connected to the same supply phase as the 3255 to which it is attached.

[2] Power Cable Length: If standard 4.3 meter (14 feet) is not desired, specify $9811 for 1.8 meter (6 feet) power cable.

[3] Cables: For cables between 3251 and 3255, specify $9071 for the first head ... for the second head, if appropriate, specify $9071 for 4.6 meters (15 feet), $9072 for 9.1 meters (30 feet), or $9073 for 15.2 meters (50 feet).

PRICES: Mid Purchase* MMC

3251 1 $14,650 $79.50

Warranty: B Per Call: 3 Machine Group: D

Useful Life Category: 2

SPECIAL FEATURES


LIGHT PEN (#4750). A hand-held, pen-like device which permits the operator to interact with the displayed image. Maximum: One per 3251. Field Installation: Yes.


Special Feature Prices: Purchase* MMC

Alphanumeric Keybd #4621 $495 $3
Light Pen #4750 $915 $45
Program Function Kybd #5555 $1,390 $2

* Pilot Test Plan applies.

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## IBM 3255 DISPLAY CONTROL

**Purpose:** Control unit that provides common controls and attachments for up to two 3251 Display Stations.

**Highlights:**
- Free standing floor mounted unit attached to a 3256 Control Unit over a coaxial cable high-speed link up to 1525 m (5000 feet) in length. Supports one or two 3251s at distances of up to 15.2 m (50 feet). *Note: At least one of the 3251s must be adjacent to the 3255.*
- 32,768 byte user-programmable display buffer shared under S/370 or 4300 Processor software control among the attached 3251 Display Stations. Capability for dynamic assignment of refresh buffer to specific 3251s, under S/370 or 4300 Processor software control - such as is provided by the OS/VS1 and OS/VS2 Graphic Access Method (GAM) SCP.
- Eight light pen display buffer orders enabling the creation of display buffer programs which perform functions such as light pen track and drag, without recourse to the S/370 or 4300 Processor... see 3251.
- Data transferred across 1M bit per second serial link between 3258 and 3255... maximum effective data rates approximate to 100K bytes per second, depending on message lengths.

**PREREQUISITES:** Control Unit - a channel attached 3258 which attaches to up to four 3255a via coaxial cable high-speed link up to 1525 m (5000 feet) long.

**Bibliography:** GC20-0001

**Specify:** [1] Power (AC, 1-phase, 3 wire, 60 Hz): For locking plug - #9980 for 115 V, #9884 for 208 V, #9886 for 230 V. For non-lock plug - #9881 for 115 V, #9885 for 208 V, #9887 for 230 V. A 3255 and its attached 3251s must all be connected to the same supply phase.

[2] Power Cable Length: If standard 4.3 meter (14 feet) is not desired, specify #9511 for 1.8 meters (6 feet).


**PRICES:**

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</table>

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## 3258 CONTROL UNIT

**Purpose:** A channel control unit which supports up to four 3255 Display Control units over high-speed links up to 1525 m (5000 feet) in length. Each high-speed link is a single customer supplied coaxial cable of standard specification available from multiple sources.

**Highlights:**
- Free standing floor mounted unit capable of receiving data from a S/370 or 4300 Processor channel at rates of up to 250K bytes per second, transmitting data to 3255 Display Control units over 1M bit per second serial links... maximum effective data rates approximate to 100K bytes per second, depending on message lengths.

**PREREQUISITE:** Channel Attachment - a control unit position on a system channel.

### Processors

<table>
<thead>
<tr>
<th>Channel Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM 3250</td>
<td>X X</td>
</tr>
<tr>
<td>IBM 3255</td>
<td>X X</td>
</tr>
</tbody>
</table>

**Selector Block Multiplexer Subchannel**

<table>
<thead>
<tr>
<th>Code</th>
<th>Model</th>
<th>3115</th>
<th>3125</th>
<th>3135</th>
<th>3145</th>
<th>3155-4300</th>
</tr>
</thead>
<tbody>
<tr>
<td>9581</td>
<td>9583</td>
<td>9584</td>
<td>9585</td>
<td>9586</td>
<td>9587</td>
<td>9596</td>
</tr>
<tr>
<td>3031</td>
<td>3032</td>
<td>3033</td>
<td>4331</td>
<td>4341</td>
<td>4342</td>
<td>4343</td>
</tr>
</tbody>
</table>

**Bibliography:** GC20-0001

**Specify:** [1] Power (AC, 1-phase, 3 wire, 60 Hz): For locking plug - #9980 for 115 V, #9884 for 208 V, #9886 for 230 V. For non-lock plug - #9881 for 115 V, #9885 for 208 V, #9887 for 230 V.

[2] Power Cable Length: If standard 4.3 meter (14 feet) is not desired, specify #9511 for 1.8 meters (6 feet).


**System Attachment:**

<table>
<thead>
<tr>
<th>Processor</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM 3250</td>
<td>X X</td>
</tr>
<tr>
<td>IBM 3255</td>
<td>X X</td>
</tr>
</tbody>
</table>

**Processor Code**

<table>
<thead>
<tr>
<th>Model</th>
<th>Md1</th>
<th>Purchase*</th>
<th>MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3258</td>
<td>1</td>
<td>$39,750</td>
<td>$345</td>
</tr>
</tbody>
</table>

**Warranty: B | Per Call: 3 | Machine Group: D**

**Useful Life Category: 2**

---

* Pilot Test Plan applies.

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IBM 3262 LINE PRINTER

Purpose: Printer output unit for the 4331 Processor at 650 lpm nominal rated speed with a 48-character set. For use with S/38, see GSD Manual.

Highlights: A general purpose optimized 64 character print belt is available ... see ‘Specify.’ The 64-character optimized belt can provide speeds up to 625 lpm. Should specific application output have unusual characteristics and not conform to the 64-character set optimized print belt, uniform print belts will provide the following nominal rated speeds:

Nominal Rated Speed
48-character set 650 lpm
64-character set 467 lpm
96-character set 364 lpm

132 print positions are standard. Horizontal spacing is 10 characters per inch. Vertical spacing is 6 or 8 lines per inch under system control. Forms skipping and spacing are program controlled. The carriage is a single speed unit allowing skipping up to 508mm (20") per second. Continuous forms are fed by a forms tractor which accepts forms of up to a maximum of 406.4mm (16") wide. See Forms Design Reference Guide for Printers, GA24-3486, for forms design considerations. A 288-character Universal Character Set Buffer is standard.

Limitations:
1. Only pin fed, continuous forms can be used.
2. Both edges of the forms must be fastened in the forms tractor.
3. No staples are permitted in the areas exposed to the interchangeable print belt.
4. Printer operation and print quality vary with paper and number of copies. Forms sets of more than four parts should be tested in operating conditions to verify that results are satisfactory.
5. Maximum forms thickness is .51mm (.020").

Maximum: Up to two 3262 mdl 1s can be attached to a 4331 Processor ... see standard Display/Printer Adapter under 4331.

Prerequisite: A position on the standard Display/Printer Adapter of the 4331.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. See "Customer Responsibilities" below.

Customer Set-up (CSU): The 3262 mdl 1 is designated as "Customer Set-up" thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

• Adequate site, system and other vendor preparation.
• Receipt at the customer’s receiving dock, unpacking and placement of the 3262 mdl 1.
• Physical set-up, connection of cables, switch settings and checkout.
• Notifying IBM of intent to relocate and following IBM instructions for relocation.
• Using and following the problem determination procedures and filling out the trouble report prior to calling IBM for service.
• Disconnecting, packing and removal to the customer’s shipping dock at time of discontinuance. Appropriate instructions will be provided by IBM.
• Replacing a worn print belt with the spare provided and rotating the platen per the instructions provided with the printer.

Supplies: A black ribbon, Part No. 7819690, or equivalent, is required.

SPECIFY

• Voltage (120 V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug.
• Power Cord: If standard 2.8 meter (9 foot) power cord is not desired, specify: #9511 for 1.8 meter (6 foot) cord, #9512 for 3.7 meter (12 foot) cord, or #9513 for 4.6 meter (15 foot) cord.
• Cabling: #9080 for below the floor, or #9081 for on the floor.
• Print Belt Character Set: Specify one feature number for character set size and specify one feature number for character set height. When printing at 8 lpi, the 2.0mm (.079") character height is recommended. Two print belts (each with the same feature numbers) will be shipped with the printer. The second belt will be a spare for use by the customer as a back-up. When the customer installs this back-up belt, a replacement should be ordered, and the platen rotated as described in the instructions provided with the printer. The customer will be billed at the current accessory belt price. If the customer desires to have IBM Customer Engineering replace or install the print belt, the CE time involved will be billed to the customer. Field Installation: Available at time of manufacture only. If additional print belts are required, see "Accessories" below and "Print Belt, Additional" in the M 10000 pages.

Specify No. Character Set Size
#9520 48-character set EBCDIC
#9524 64-character set EBCDIC
#9523 64-character set EBCDIC (optimized)
#9526* 96-character set EBCDIC

* available only with 2.4mm character height (#9950)

Specify No. Character Set Height
#9951 2.0mm (.079")
#9950 2.4mm (.095")

• Cables: The customer is responsible for procurement, installation and maintenance of the coaxial signal cable. See M 10000 pages for cable prices and ordering instructions.
• Color: Background color is pearl white. One color accent panel must be specified. #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

Mdl MRC 2 Yr Purchase MMMC/ AMMCR
3262 1 $411 $350 $14,000 $150

Plan Offering: Plan D Maintenance: B Per Call: 1 Purchase Option: 45% Warranty: B Useful Life Category: 2 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 5%
Initial Period of Maintenance Service: 3 mos.

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the Feature Number indicated below. See M 10000 pages for prices, additional information, and field installation.

Print Belt, Additional — permits the customer to obtain more than one character set print belt. Installation and replacement of these print belts is the customer’s responsibility. If the customer desires to have IBM Customer Engineering replace or install the print belt, the CE time will be billed to the customer.

When ordering, indicate one feature number for character set size and one feature number for character height.

Feature No. Character Set Size
#5940 48-character EBCDIC
#5944 64-character EBCDIC (optimized)
#5944 64-character EBCDIC
#5948* 96-character EBCDIC

* Available only with 2.4mm character height (#5950).

Feature No. Character Set Height
#5951 2.0 mm (.079")
#5950 2.4 mm (.095")

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Purpose: Provides control and multiplexing capabilities for a cluster of 3277 Display Stations, 3284, 3286, 3287 Printers and 3286 Line Printers. The 3271 communicates with S/360 mdl 25, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195 or any S/370 Processor via a 2701 Data Adapter Unit, 2703 Transmission Control or, except for S/360 mdl 25 or 85, a 3704 or 3705 Communications Controller on half-duplex communications facilities using binary synchronous transmission. The 3271 communicates with the 4300 Processors via a 2701 Data Adapter Unit or a 3704 or 3705 Communications Controller, and with the 4331 Processor via the 4331 Interface Adapter. See the 3704 and 3705 Machines and Programming sales manuals for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

Model 1: For attachment of 3277 Display Station mdl 1s (480 characters), 3284 Printer mdl 1s, 3286 Printer mdl 1s and 3287 Printer mdl 1s and 2s. The basic unit provides attachment of up to four devices at transmission speeds of 2000 or 2400 bps. NOTE: One 3277 mdl 1 must be installed with the basic 3271... the remaining three devices may be any combination of 3277 mdl 1s, 3284 mdl 1s, 3286 mdl 1s and 3287 mdl 1s and 2s.

Model 2: For attachment of 3277 Display Station mdl 2s (1920 characters), 3277 mdl 1s (480 characters), 3284 Printer mdl 1s and 2s, 3286 Printer mdl 1s and 2s, and 3288 Line Printer mdl 2s. The basic unit provides attachment of up to four devices at transmission speeds of 2000 or 2400 bps. NOTE: One 3277 mdl 2 must be installed with the basic 3271... the remaining three devices may be any combination of 3277 mdl 1s, 3284 mdl 1s and 2s, 3286 mdl 1s and 2s, 3287 mdl 1s and 2s, and 3288 mdl 2s.

Highlights: Up to thirty-two devices (3277s, 3284s, 3286s, 3287s and 3288s) may be attached in increments of four devices by adding up to seven Device Adapters (#3250) ... see "Special Features." Efficient communications facility utilization by means of Compacted Data (blank suppression and modified data transmission), program tab, and character addressing.

The 3271 may be multidropped on the same facility with other BSC devices (1800, 2715, 2770, 2780, 3271, 3275 or 3780) as tributary stations on a multipoint line with a S/360 mdl 22-195 (except mdl 44) or any S/370 or 4300 Processor as a control station.

Communications with a S/370 mdl 115, 125, 135-3, 138 can be made via the Integrated Communications Adapter (#4640) or (#2001) on the 4331 Processor and appropriate binary synchronous facilities on the 3115, 3125, 3135 or (#1601) on the 4331 Processor as well as via a 2701, 2703, 3704 or 3705.

Display Exception Monitoring Facility (DEMF), a software tool for network problem determination/ isolation enhances the availability and serviceability of the 3271 in BSC mode. See DEMF in the Programming/SCP sections for OS/VS1 and OS/VS2.

Communications Facilities: The 3271 operates in half-duplex mode at transmission speeds of 1200, 2000 or 2400 bps on facilities D3, D4 or X1M via the 2701, 2703, 3704, 3705, or #4640 on 3115, 3125, 3135, 3135-3 or 3138, or (#1601) on the 4331 Processor, using binary synchronous transmission. The 3271 communicates in half-duplex multipoint mode on duplex facilities at transmission speeds of 1200, 2000, 2400 or 4800 bps on facilities D3, D4, D5, X1M or X2M via the 2701, 2703, 3704, 3705, or #4640 on 3115, 3125, 3135, 3135-3 or 3138, or (#1601) on the 4331 Processor, using binary synchronous transmission. Half-duplex multipoint operation on duplex facilities at 7200 bps on facility D6 is also available on the 2701, 3704, 3705, or #4640 on 3115, 3125, 3135, 3135-3 or 3138, or (#1601) on the 4331 Processor, using binary synchronous transmission. See M 2700 pages for facilities.

Modems: IBM one modem can be attached to any model of a 3271. Prerequisite: Transmission Speed (#7821) required for speeds over 2400 bps.

Switched network backup operation is available on the 3872 mdl 1, 3874 and 3875. 4-wire switched network backup operation is available on the 3863 mdl 1 and 3864 mdl 1. For communications capabilities, product utilization and special features, see M 2700, 3863, 3864, 3872, 3874, 3875 pages.

**PREREQUISITES:** Transmission via communications facility to a 2701, 2703, 3704, or #4640 on 3115, 3125, 3135, 3135-3, 3138 or (#1601) on 4331 Processor. See M 2700 pages.

One 3277 with keyboard must be installed on each 3271 on a model for model basis as a diagnostic aid. That is, 3277 mdl 1 on 2771 mdl 1, or 2771 mdl 2 on 2771 mdl 2.

Systems 360/370 or 4300 Processor availability will be restricted unless the using installation provides sufficient core to allow diagnostic programs (OLTs) to be executed. For details associated with the required additional core sizes, see the appropriate SRL (TCAM, BTAM, and VTAM).

**Bibliography:** See KWIC Index G320-1621 or IBM bibliography.

**SPECIFY:** [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug - #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-locking plug - #9881 for 115 V, #9885 for 208 V, or #9877 for 230 V.

[2] Cables: To cable modem must be ordered. See M 10000 pages for prices and ordering instructions for cables from 3277, 3284s, 3286s, 3287s and 3290s. Also see 3270 Installation Manual - Physical Planning, GC27-276C.

**System Attachment:** Identify the host processor(s) by specifying the following codes:

**Note:** For System/3 Specify codes, see GSD manual.
Modem Speed (bps)  
(non-switched)  
Modem Speed (bps)  
(non-switched)  
3863 mdl 1  2400/1200  3874 mdl 1  4800  
3864 mdl 1  4800/2400  3875 mdl 1  7200  
3872 mdl 1  2400/1200  3863 mdl 1 and 3865 mdl 1 and 2 For communications capabilities, product utilization and special features, see M 2700, 3863, 3864, 3865, 3872, 3874 and 3875 pages.

PREREQUISITES: (1) Transmission via communications facility to a 3704, 3705 or Communications Adapter on 4331 Processor requires a modem. Clocking for 1200 bps is provided by the 3271. Clocking above 1200 bps is provided by the modem ... (2) As a diagnostic aid, one 3277 mdl 1 with keyboard or one 3277 mdl 2 with keyboard must be installed on a 3271 mdl 11 or on a 3271 mdl 12 respectively.  

Bibliography: See KWIC index, G320-1621 or specific system bibliography.  

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9897 for 230 V.  

[2] Cables: Cable to attach modem must be ordered. See M 10000 pages for prices and ordering instructions for cables from 3277s, 3284s, 3286s, 3287s and 3288s. Also see 3270 Installation Manual - Physical Planning, GA27-2787.  


HOST PROCESSOR Code Host Processor Code  
S/370 mdl 115  #9589 S/370 mdl 165 II 9594  
S/370 mdl 125  9586 S/370 mdl 166, 166MP 9588  
S/370 mdl 135, 135-3 9581 3031 Processor 9599  
S/370 mdl 138  9595 3032 Processor 9598  
S/370 mdl 145, 145-3 9582 3033 Processor 9597  
S/370 mdl 148  9596 4331 Processor 9606  
S/370 mdl 155 II  9583 4341 Processor 9607  
S/370 mdl 158, 158 MP 9587  

PRICEs: Mdl  
MAC/ MRC  2 yr Purchase MMMC  
3271 11  $224  $191  $6,440  $46.50  
12  239  203  6,945  49.50  

Plan Offering: Plan B Purchase Option: 60% Machine Group: A  
Warranty: B Useful Life Category: 2 Per Call: 1  
Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 5%  

Model Changes: Field Installable.  

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)  
From Model 11 to Model 12 .... $ 694  

SPECIAL FEATURES  
DATA ANALYSIS-APL FEATURE (#1066). Mdl 12 only  
Accommodates APL characters and TN train (see Type Catalog, S/370 Printers) characters. These, in addition to EBCDIC (dual case only) characters, may be transmitted between S/370 or 4300 Processor and selected I/O units of the 3270 System. Field Installation: Yes. Note: The Data Analysis-APL Feature is precluded from ASCII controller.  

ASCII TRANSMISSION CODE (#1200). Utilizes 8-bit ASCII code over transmission facilities. Used in conjunction with ASCII Character Set (A) (#9091) or ASCII Character Set (B) (#9082) on the 3277, 3284, 3286, 3288, or ASCII Character Set (B) (#9084) on the 327. Field Installation: Available at time of manufacture only.  

DEVICE ADAPTER (#3250). Each permits the addition of four devices (3277s, 3284s, 3286s, 3287s, 3288s in any combination). Maximum: Seven ... for a maximum of 32 attached devices. Field Installation: Yes.  


SPECIAL FEATURE Prices:  
MAC/ MRC  2 yr Purchase MMMC  
Data Analysis-APL Fee #1066 $ 42  $ 36  $ 630  $1.50  
Automatic Transmission Code 1200  $ 8  786  50  
Device Adapter 3250  51  43  779  50  
Trans Speed - 1200 bps 7820 NC NC NC NC  

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Purpose: Provides the controls and multiplexing capabilities for a cluster of 3277 Display Stations, 3284, 3286 and 3287 Printers, and 3288 Line Printers. The 3272 attaches to a S/360, S/370, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195; or any S/370 Processor via a multiplexer, selector, or block multiplexer channel; or any 4300 Processor via a byte multiplexer or block multiplexer channel. NOTES: (1) 3286 mdl 2 attaches only to a 3272 mdl 2 ... (2) Attachment to a non DCC subchannel of a block multiplexer channel or to a selector channel is not recommended due to performance considerations which may yield less than maximum throughput.

Model 1 For attachment of 3277 Display Station mdl 1s (480 characters), 3284 Printer mdl 1s, 3286 Printer mdl 1s and 3287 Printer mdl 1s and 2s. The basic unit provides for attachment of up to four devices at a data transfer rate of up to 650,000 characters/second. 

Model 2 For attachment of 3277 Display Station mdl 2s (1,920 characters), 3277 mdl 1s (480 characters), 3284 and 3286 Printer mdl 1s and 2s, 3287 Printer mdl 1s and 2s, and 3288 Line Printer mdl 2s. The basic unit provides for attachment of up to four devices at a data transfer rate of up to 650,000 characters/second. 

Model 3 Provides for attachment of up to four devices at a data transfer rate of up to 650,000 characters/second. 

Highlights: Up to thirty-two devices (3277s, 3284s, 3286s, 3287s, 3288s) may be attached in increments of four devices by adding up to seven Device Adapters (#3290) to provide special features. 

Basic features include Compacted Data (blank suppression and modified data transmission), program tab, and character addressing.

Display Exception Monitoring Facility (DEMF), a software tool for network problem determination/isolation enhances the availability and serviceability of the 3272 in BSC mode. See DEMF in the Programming/SCP sections for OS/VS1 and OS/VS2.

PREREQUISITES: One 3277 with keyboard must be installed on each 3272 on a model for model basis, as a diagnostic aid. That is, 3277 mdl 1 on 3272 mdl 1, or 3277 mdl 2 on 3272 mdl 2.

Each 3272 requires a control unit position on a system channel.

S/360 mdl 25 -- special feature on 2025; Multiplexer Channel or Selector Channel ... see 2025.

S/360 mdl 30, 40, 50 -- multiplexer channel (standard), or Selector Channel (special feature) ... see 2030, 2040, 2050.

S/360 mdl 65, 67, 75 -- selector channel of a 2860, basic multiplexer channel of a 2870, Selector Subchannels (special features) on 2870 ... see 2860, 2870.

S/360 mdl 85, 195 or S/370 mdl 165, 168, 195 -- selector channel of a 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) of 2870, block multiplexer channel of 2880 ... see 2860, 2870, 2880.

S/370 mdl 115, 125 -- Multiplexer Channel (special feature) ... see 3115, 3125.

S/370 mdl 135, 135-3, 138, 145, 145-3, 148, 155, 158 -- byte multiplexer channel, block multiplexer channel, selector channel ... see 3135, 3135-3, 3138, 3145, 3145-3, 3148, 3155, 3158.

3031, 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channel (five are standard) ... see 3031, 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- Byte Multiplexer Channel (one is optional), Block Multiplexer Channel (one is optional). See M 4331 pages.

4341 Processor -- Byte Multiplexer Channel (one is standard), Block Multiplexer Channel (two are standard). See M 4341 pages.

Systems 360, 370 or 4300 Processor availability will be restricted unless the using system provides sufficient core to allow diagnostic programs (OLTs) to be executed. For details associated with the required additional core sizes, see the appropriate SRL (TCAM, BTAM and VTAM).


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IBM 3274 CONTROL UNIT

Purpose: Provides the capability of controlling up to a maximum cluster of thirty-two terminals consisting of display stations, serial matrix printers and/or line printers. Two categories of terminal adapters are used in attaching the desired displays or printers ... see terminal attachment list below. The basic 3274 Control Unit allows attachment of up to eight Category A terms. The two categories of terminal adapters can be featured in various combinations to provide the maximum terminal configuration of 32 termin­

nations to provide the maximum terminal configuration of 32 termi­

nals (a maximum of 16 of the 32 terminals can be Category B units and at least one Category A Display Station with keyboard is needed for diagnostic purposes). The 3274 has one model for communicating in data half duplex mode via half duplex or duplex communications facilities and three models for local channel attac­

Note: For use with System/3, see GSD Manual.

ATTACHABLE TERMINALS

Category A Terminals

* Model 5 cannot attach to a 3274 mdl 1B.

Model 1A -- for local (SNA version) attachment, via a byte multi­

plexer, selector or *block multiplexer channel, to S/370 mdls 115 through 168 MP, 3031, 3032 and 3033 Processors, or any 4300 Processor via a byte multiplexer or block multiplexer channel.

Model 1B -- for local (3272 version) attachment, via a byte multi­

plexer, selector, or *block multiplexer channel, to S/370 mdls 115 through 168 MP, 3031, 3032 or 3033 Processor, S/369 mdls 30, 40, 50, 65, 75 and 195, or any 4300 Processor via a byte multiplexer or block multiplexer channel.

Note: *Attachment to a non DCC subchannel of a block multi­

plexer channel or to a selector channel is not recommended due to performance considerations which may yield less than maximum throughput.

Model 1C -- for communicating in data half duplex mode over half duplex or duplex communication facilities with the following:

S/370 mdls 115 through 168 MP and 3031, 3032, 3033 or 4300 Processors -- via 3704 or 3705 Communications Controller (or the Communications Adapter feature on the 4331. Note: These units are not supported by ACF/VTAME.) using Synchro­

nous Data Link Control (SDLC/SNA).

S/370 mdls 115 through 195 and 3031, 3032, 3033 or 4300 Pro­

cessors -- via (where applicable) a 2701 Data Unit Adapter, 2703 Transmission Control, a 3704 or 3705 Communications Controller, or a Communications Adapter feature on the 4331, using Binary Synchronous Communications (BSC).

S/370 mdls 115, 125, 135 and 138 -- via an Integrated Com­

munications Adapter (ICA) using Binary Synchronous Communica­

tions (BSC).

Model 1D -- for local (3272 version) attachment, via a byte multi­

plexer, selector or *block multiplexer channel, to virtual storage S/370 mdls 115 thru 168MP, 3031, 3032 and 3033 Processor, or any 4300 Processor via a byte multiplexer or block multiplexer channel.

Note: *Attachment to a non-DCC subchannel of a block multi­

plexer channel or to a selector channel is not recommended due to performance considerations which may yield less than maximum throughput.

Highlights: The 3274 Control Unit is a terminal control unit which can attach up to thirty-two displays, serial matrix printers and/or line printers. These terminals are grouped into two categories, the Category A terminals are a display and printers which were developed for attachment to the 3274 Control Unit, while the Cate­

gory B terminals can attach to a 3271 or 3272 Control Units. The 3274 Control Unit was designed to attach either the Category B terminals with certain limitations. A maximum of sixteen of the thirty-two attachable terminals can be selected when customizing terminals. Category A terminals can be driven up to a maximum of 1500 meters (4920 feet), while Category B terminals can only be driven a maximum of 610 meters (2000 feet). Both categories of terminals attach to their respective Terminal Adapter by the same type coaxial cable and connectors which are used between a 3271 or 3272 Control Unit and its display or printer terminals.

The 3274 can communicate with a S/360, S/370 or 4300 Pro­

cessor by local channel attachment only. Data terminal operation is performed via the byte multiplexer or block multiplexer channel. The channel attached control unit is available in three models: Model 1A for SNA operation with extended data stream handling capabilities, model 1B for 3272 operation, and model 1C for 3272 operation with extended data stream handling capabili­

ties. The model 1C can operate with extended data stream han­

dling capabilities as either a Binary Synchronous Communications 3271 or as an SNA/SDLC unit. One feature diskette and two systems diskettes are shipped with each 3274. An Encrypt/Decrypt feature diskette is also shipped with the Encrypt/Decrypt feature on a 3274 mdl 1C.

The flexibility of 3274 Control Units enables the user to configure a display sub-system for initial requirements, and later change hardware and functions to meet future needs. Function configurability is attained through a Configuration Support option via feature and system diskettes.

As part of the installation procedure, a customized system diskette is generated. The generation process is accomplished by the customer keying in system configuration parameters. A unique configuration table is written on the system diskette along with the necessary control code to accomplish the functions. For example, during subsequent control unit loading or initialzation of a Model 1C, SBC or SNA/SDLC mode of operation is determined by the configuration recorded on the system diskette used. It is possible to operate two different system diskettes; one to be used for SBC (3271 compatible) operation and the other to be used when oper­

ating SNA/SDLC.

The control unit is initialized with control code and configuration parameters as a result of Power On or by pressing the IML switch button. The load occurs from an integrated diskette drive using the previously customized system diskette. The loading process starts with the execution of extended tests contained on the diskette.

The character set to be used on attached terminals is specified on the customized IML diskette during installation procedure. All attached terminals must have the same character set. Either EBCDIC or ASCII transmission can be specified when customizing a diskette for a 3274 mdl 1C that will use the BSC mode of operation. ASCII support of the data bytes in Function Management Data Request/Response Units may be selected when customizing diskettes for 3274 mdl 1C, for all 3270 data streams (except SCS and APF/Text applications). ASCII support (BSC) is provided to correspond with the transmission code that is used by the central processing system.

Detailed information for initial customizing, for customizing made necessary by changing configurations, and for optionally updating the diskettes, is contained in the IBM 3270 Information Display System, IBM 3274 Control Unit Planning, Setup, and Customizing Guide, GA27-2827.

Communications: The 3274 mdl 1C communicates with a S/370 or 4300 Processor using Synchronous Data Link Control (SDLC) over full or half duplex communications facilities to a 3704/3705 Communications Controller (or the Communications Adapter feature on the 4331. Note: These terminals are not supported by ACF/VTAM, or by BSC/SDLC/SNA protocols. The load occurs from an Integrated Communications Adapter (#4640) and appro­

priate binary synchronous features on the 3115, 3125, 3135 or 3136. Communications with a 4331 Processor can be via the Integrated Communications Adapter (#1601) using BSC or SDLC/SNA protocols.

Communications Facilities: The 3274 mdl 1C operates in half duplex point-to-point or multipoint mode on half duplex or duplex facilities at transmission speeds of 2000, 4000, 6000, 9600 bps on non-switched facilities D4, D4M, D4SB, D5, D5M, DSSB, D6, D6M, D6SB, D7, D7M, D7SM, X1, X1M, X2, X2M, X3 and X3M. See M 2700 pages for facilities.

Modems: Unless a DDS Adapter (#5650 or #5651) is installed in a 3274 mdl 1C, an external modem with its own clocking must be attached to a 3274 mdl 1C with the External Modem Interface (EIM) and either Communications Adapter (#6301) or High Performance Communications Adapter (#6303) installed.

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3274 Control Unit (cont'd)

IBM Modems  Speed (bps)
3863 mdl 1  2400/1200
3864 mdl 2  4800/2400
3865 mdl 1, 2  9600/4800
3872 mdl 1  2400/1200
3874 mdl 1  4800/2400
3875 mdl 1  7200/3600

4 wire switched network backup is available on 3863, 3864 and 3865 modems with auto answer. Switched network backup operation with Manual Call and Manual or Auto Answer is available on the 3872 mdl 1, 3872 mdl 1 and 3875 mdl 1. For communications capabilities, product utilization and features, see M 2700 and M 3863, 3864, 3865, 3872, 3874 and 3875 pages.

Problem Determination Procedure: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. See "Customer Responsibilities" below.

Display Exception Monitoring Facility: Switched network backup operation with Manual Call and Manual or Auto Answer is available on the 3872 mdl 1, 3872 mdl 1 and 3875 mdl 1. For communications capabilities, product utilization and features, see M 2700 and M 3863, 3864, 3865, 3872, 3874 and 3875 pages.

Customer Responsibilities:
The customer is responsible for:

 Adequate site, system and other vendor preparation.
 Physical setup, connection of cables to TP lines/modems and IBM devices incorporating protected customer access areas, switch settings, and checkout.
 Contact IBM Field Engineering to make cable connections of IBM CSU units to IBM non-CSU units where customer access areas are not provided.
 Notify IBM of intent to relocate and follow IBM instructions for relocation.
 Use and follow the problem determination procedures and fill out the trouble report prior to calling for IBM service.
 Disconnecting, packing and removal to the customer's shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.
 Receipt at the customer's receiving dock, unpacking, and placement of the 3274.
 Contacting IBM Field Engineering to accomplish the channel connection tasks ... for the 3274 mdl 1A, 1B or 1D.
 Connection of communication cable to the communication facility for the 3274 mdl 1C.
 Performing 3274 Control Unit Customization in accordance with IBM supplied procedures.
 a. For initial installation.
 b. When made necessary by changes in configuration.
 c. Updating of the control unit diskettes (at the customer's option).

Prerequisites: [1] One 3274 Display Station with keyboard is needed on each 3274 as a diagnostic aid. It must be attached to the first terminal address on the control unit (Port 01). ... [2] For a model 1C, 1D External Modem Interface (#3701) or DDS Adapter (#5650 or #5651) must be ordered along with either Common Communications Adapter (#6302) or High Performance Communications Adapter (#6303) ... see "Special Features." Either an IBM or non-IBM external modem, with its own clocking, must be provided.

Bibliography: See applicable KWIC Index listed below, or specific system bibliography.

3274 Model 1A  -- G320-1621
3274 Model 1B  -- G2C0-0360 (S/360)
3274 Model 1B  -- G2C0-0001 (S/370)
3274 Model 1C  -- G2C0-0001
3274 Model 1D  -- G2C0-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking Plug -- #9890 for 120 V (Mdl 1C only), #9884 for 208 V, or #9894 for 240 V. Non-lock Plug -- #9891 for 120 V (Mdl 1C only), #9885 for 208 V, or #9995 for 240 V. For Watertight Connector, see "Special Features."

[2] Power Cable Length: If standard 4.3 meter (14 feet) power cable is not desired, specify #9511 for 1.8 meters (6 feet).

3274 Model 1B  -- G320-1621
3274 Model 1B  -- G2C0-0360 (S/360)
3274 Model 1B  -- G2C0-0001 (S/370)
3274 Model 1C  -- G2C0-0001
3274 Model 1D  -- G2C0-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking Plug -- #9890 for 120 V (Mdl 1C only), #9884 for 208 V, or #9894 for 240 V. Non-lock Plug -- #9891 for 120 V (Mdl 1C only), #9885 for 208 V, or #9995 for 240 V. For Watertight Connector, see "Special Features."

[2] Power Cable Length: If standard 4.3 meter (14 feet) power cable is not desired, specify #9511 for 1.8 meters (6 feet).

3274 Model 1C  -- G2C0-0001

3274 Model 1D  -- G2C0-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking Plug -- #9890 for 120 V (Mdl 1C only), #9884 for 208 V, or #9894 for 240 V. Non-lock Plug -- #9891 for 120 V (Mdl 1C only), #9885 for 208 V, or #9995 for 240 V. For Watertight Connector, see "Special Features."

[2] Power Cable Length: If standard 4.3 meter (14 feet) power cable is not desired, specify #9511 for 1.8 meters (6 feet).

3274 Model 1C  -- G2C0-0001

3274 Model 1D  -- G2C0-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking Plug -- #9890 for 120 V (Mdl 1C only), #9884 for 208 V, or #9894 for 240 V. Non-lock Plug -- #9891 for 120 V (Mdl 1C only), #9885 for 208 V, or #9995 for 240 V. For Watertight Connector, see "Special Features."

[2] Power Cable Length: If standard 4.3 meter (14 feet) power cable is not desired, specify #9511 for 1.8 meters (6 feet).
3274 Control Unit (cont'd)
Type D1 (#3627). Maximum: One. Field Installation: Yes.

EXTENDED FUNCTION STORE (EFS) Type C1 (#3622), Type C3 (#3625), Type D1 (#3627). Provides increments of control and storage that exceed the storage capacity of the basic machine. Types C1, C3 and D1 (#3622, 3625, 3627) each provide increments of 16,384 bytes. To determine which Extended Function Store feature may be required, refer to the 3274 Control Storage Requirement Tables 1 and 2 below.

Note: A description of non-"Specify", non-"Feature" and non-"Machine" Control Storage Requirement Functions is given later in this section, with the exception of "Category A Terminals", "Category B Terminals", EBCDIC and ASCII, which have been described above.

3274 CONTROL STORAGE REQUIREMENT TABLES

Configuration flexibility is provided through two Configuration Support options.

STEP #1: Determine which Configuration Support contains the functions desired.

STEP #2: After determining the desired Configuration Support, select the applicable part of Table 1 (Part 1, 2, 3 or 4) to determine the Type C and Type D storage requirements for the 3274 models 1A, 1C/SNA, 1C/BSC, or 1D respectively.

STEP #3: Total the Type C and Type D storage requirements determined in Step #2.

STEP #4: With the total 3274 storage requirements found in Step #3, use Table 2 to determine if the base 3274 storage is adequate or if additional storage must be ordered. If additional storage is required, Table 2 will show which Extended Function Store (EFS) type features must be ordered.

### Table 1 - Part 1

<table>
<thead>
<tr>
<th>3274 MODEL 1A</th>
<th>TYPE C</th>
<th>TYPE D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1A Base (including copy)</td>
<td>41,200</td>
<td>13,600</td>
</tr>
<tr>
<td>Configuration Support A</td>
<td>43,672</td>
<td>14,884</td>
</tr>
<tr>
<td>Category B Terminals</td>
<td>4,900</td>
<td>4,600</td>
</tr>
<tr>
<td>APL/Text Control Function</td>
<td>1,700</td>
<td>1,200</td>
</tr>
<tr>
<td>3289 Text Print Control</td>
<td>0</td>
<td>512</td>
</tr>
<tr>
<td>Host Loadable Printer Authorization Matrix</td>
<td>500</td>
<td>0</td>
</tr>
<tr>
<td>Between Bracket Printer Sharing</td>
<td>800</td>
<td>100</td>
</tr>
<tr>
<td>SCS Printer Support (3287-#9660)</td>
<td>1,600</td>
<td>100</td>
</tr>
<tr>
<td>Magnetic Reader Control (3278-#4999)</td>
<td>600</td>
<td>60</td>
</tr>
<tr>
<td>3275/3277 Like 10-Character Set</td>
<td>6,144</td>
<td>316</td>
</tr>
<tr>
<td>Keyboard Support</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Typewriter(1) (3278-#4621, #4624, #4627, #4628)</td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td>Data Entry(1) (3278-#4622)</td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td>Data Entry KP(1) (3278-#4623)</td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td>Text (3278-#4629)</td>
<td>0</td>
<td>1,560</td>
</tr>
<tr>
<td>APL (3278-#4626)</td>
<td>0</td>
<td>1,560</td>
</tr>
</tbody>
</table>

Add'' Category A Terminals (8 included in base) Type D

| 9 to 16 total category A terminals | 2,048 |
| 17 to 24 total category A terminals | 4,096 |
| 25 to 32 total category A terminals | 6,144 |

### Table 1 - Part 2

<table>
<thead>
<tr>
<th>3274 MODEL 1C/SNA</th>
<th>TYPE C</th>
<th>TYPE D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1C/SNA EBCDIC (including Copy)</td>
<td>41,010</td>
<td>13,700</td>
</tr>
<tr>
<td>Configuration Support A</td>
<td>46,102</td>
<td>15,096</td>
</tr>
<tr>
<td>Model 1C/SNA ASCII (including Copy)</td>
<td>41,446</td>
<td>14,100</td>
</tr>
<tr>
<td>Configuration Support A</td>
<td>46,538</td>
<td>15,496</td>
</tr>
<tr>
<td>Category B Terminals</td>
<td>4,900</td>
<td>4,600</td>
</tr>
<tr>
<td>APL/Text Control Function</td>
<td>1,700</td>
<td>1,200</td>
</tr>
<tr>
<td>3289 Text Print Control</td>
<td>0</td>
<td>512</td>
</tr>
<tr>
<td>High Performance Communications Adapter (#6303)</td>
<td>600</td>
<td>-500</td>
</tr>
<tr>
<td>Host Loadable Printer Authorization Matrix</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Between Bracket Printer Sharing</td>
<td>800</td>
<td>100</td>
</tr>
<tr>
<td>SCS Printer Support (3287-#9660)</td>
<td>1,600</td>
<td>100</td>
</tr>
<tr>
<td>Magnetic Reader Control (3278-#4999)</td>
<td>600</td>
<td>60</td>
</tr>
<tr>
<td>3275/3277 Like 10-Character Set</td>
<td>1,630</td>
<td>316</td>
</tr>
<tr>
<td>Encrypt/Decrypt (#3680)</td>
<td>3,200</td>
<td>900</td>
</tr>
<tr>
<td>Keyboards</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Typewriter(1) (3278-#4621, #4624, #4627, #4628)</td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td>Data Entry(1) (3278-#4622)</td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td>Data Entry KP(1) (3278-#4623)</td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td>Text (3278-#4629)</td>
<td>0</td>
<td>1,560</td>
</tr>
<tr>
<td>APL (3278-#4626)</td>
<td>0</td>
<td>1,560</td>
</tr>
</tbody>
</table>

### Table 1 - Part 3

<table>
<thead>
<tr>
<th>3274 MODEL 1C/BSC</th>
<th>TYPE C</th>
<th>TYPE D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1C/BSC EBCDIC</td>
<td>38,000</td>
<td>13,800</td>
</tr>
<tr>
<td>Configuration Support A</td>
<td>41,872</td>
<td>14,684</td>
</tr>
<tr>
<td>Model 1C/BSC ASCII</td>
<td>38,000</td>
<td>14,500</td>
</tr>
<tr>
<td>Configuration Support A</td>
<td>41,872</td>
<td>15,384</td>
</tr>
<tr>
<td>Category B Terminals</td>
<td>4,700</td>
<td>700</td>
</tr>
<tr>
<td>APL/Text Control Function</td>
<td>2,200</td>
<td>4,700</td>
</tr>
<tr>
<td>Copy (Print Key Function)</td>
<td>2,700</td>
<td>0</td>
</tr>
<tr>
<td>3289 Text Print Control</td>
<td>0</td>
<td>512</td>
</tr>
<tr>
<td>Host Loadable Printer Authorization Matrix</td>
<td>550</td>
<td>0</td>
</tr>
<tr>
<td>Magnetic Reader Control (3278-#4999)</td>
<td>600</td>
<td>60</td>
</tr>
<tr>
<td>3275/3277 Like 10-Character Set</td>
<td>1,120</td>
<td>316</td>
</tr>
<tr>
<td>Keyboard Support</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Typewriter(1) (3278-#4621, #4624, #4627, #4628)</td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td>Data Entry(1) (3278-#4622)</td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td>Data Entry KP(1) (3278-#4623)</td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td>Text (3278-#4629)</td>
<td>0</td>
<td>1,560</td>
</tr>
<tr>
<td>APL (3278-#4626)</td>
<td>0</td>
<td>1,560</td>
</tr>
</tbody>
</table>

Add'' Category A Terminals (8 included in base) Type D

| 9 to 16 total category A terminals | 2,048 |
| 17 to 24 total category A terminals | 4,096 |
| 25 to 32 total category A terminals | 6,144 |

Add'' Category B Terminals (3)

| 1 to 4 category B terminals | 1,024 |
| 5 to 8 category B terminals | 2,048 |
| 9 to 12 category B terminals | 3,072 |
| 13 to 16 category B terminals | 4,096 |

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**Table 1 - Part 4**

<table>
<thead>
<tr>
<th>3274 MODEL 1D</th>
<th>TYPE C</th>
<th>TYPE D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1D</td>
<td>Configuration Support A</td>
<td>34,500</td>
</tr>
<tr>
<td></td>
<td>Configuration Support B (3691)</td>
<td>38,372</td>
</tr>
<tr>
<td>Category B Terminals</td>
<td></td>
<td>4,300</td>
</tr>
<tr>
<td>APL/Text Control Function</td>
<td></td>
<td>1,700</td>
</tr>
<tr>
<td>Copy (Print Key Function)</td>
<td></td>
<td>2,700</td>
</tr>
<tr>
<td>3299 Text Print Control</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Host Loadable Printer</td>
<td>Authorization Matrix</td>
<td>550</td>
</tr>
<tr>
<td>Magnetic Reader Control (3278-#4999)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3275/3277 Like 10-Character Set</td>
<td>Numeric &amp; Alphanumeric Character Sets</td>
<td>1,120</td>
</tr>
<tr>
<td>Keyboards</td>
<td>Typewriter(1) (3278-#4621, #4624, #4627, #4628)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Data Entry (3278-#4622)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td></td>
<td>Data Entry KP(1) (3278-#4623)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>786</td>
</tr>
<tr>
<td></td>
<td>Text (3278-#4629)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1,560</td>
</tr>
<tr>
<td></td>
<td>APL (3278-#4626)</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>1,560</td>
</tr>
<tr>
<td>Add’l Category A Terminals (8 included in base)</td>
<td>TYPE D</td>
<td></td>
</tr>
<tr>
<td>9 to 16 total category A terminals</td>
<td>2,048</td>
<td></td>
</tr>
<tr>
<td>17 to 24 total category A terminals</td>
<td>4,096</td>
<td></td>
</tr>
<tr>
<td>25 to 32 total category A terminals</td>
<td>6,144</td>
<td></td>
</tr>
<tr>
<td>Category B Terminals (3)</td>
<td>TYPE D</td>
<td></td>
</tr>
<tr>
<td>1 to 4 category B terminals</td>
<td>1,024</td>
<td></td>
</tr>
<tr>
<td>5 to 8 category B terminals</td>
<td>2,048</td>
<td></td>
</tr>
<tr>
<td>9 to 12 category B terminals</td>
<td>3,072</td>
<td></td>
</tr>
<tr>
<td>13 to 16 category B terminals</td>
<td>4,096</td>
<td></td>
</tr>
</tbody>
</table>

1. (Configuration Support A restriction only) Only two of the three key-
   board types (Typewriter, Data Entry or Data Entry-Keypunch like) can be
   supported at any one time on displays attached to a 3274 Control Unit.
   Text and APL keyboards are not affected by this limitation and can
   be supported at one time on displays attached to a 3274 Control Unit.

2. (If the total Type D requested for Category A and Category B terminals
   exceeds 6,144, use 6,144.

3. (If the total Type D requested for Category A and Category B terminals
   exceeds 6,144, use 6,144.

**Table 2**

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>SIZE</th>
<th>FEATURE CODES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type C + Type D</td>
<td>≤65,536</td>
<td>None</td>
</tr>
<tr>
<td>Type C + Type D and Type C</td>
<td>&gt;65,536</td>
<td>#1801 and #3622</td>
</tr>
<tr>
<td>Type C + Type D and Type D</td>
<td>&gt;49,152</td>
<td>#1801 and #3622</td>
</tr>
<tr>
<td>Type C + Type D and Type D</td>
<td>≥54,152</td>
<td>#1801 and #3622 and #3627</td>
</tr>
<tr>
<td>Type C + Type D and Type C</td>
<td>&gt;49,152</td>
<td>#1801, #3622 and #3627</td>
</tr>
<tr>
<td>Type C + Type D and Type D</td>
<td>≥54,152</td>
<td>#1801, #3622 and #3627</td>
</tr>
<tr>
<td>Type C + Type D and Type C</td>
<td>&gt;32,768</td>
<td>#1801, #3622, #3625 and #3627</td>
</tr>
<tr>
<td>Type C + Type D and Type D</td>
<td>≥32,768</td>
<td>#1801, #3622, #3625 and #3627</td>
</tr>
</tbody>
</table>

**Program 5738-RC2** and the IBM Programmed Cryptographic Facility Program Product (Program 5740-XY5), data transmitted over unprotected communication lines can be safeguarded through cryptography. **Maximum**: One. **Field Installation**: Yes. **Note**: A mercury battery, IBM Part No. 1743456 or equivalent, is needed. A battery is shipped with this feature. See M10000 pages for additional or replacement battery. Replacement of the dis-
   charged battery is the customer’s responsibility. The discharged IBM battery should be returned to IBM.

**EXTERNAL MODEM INTERFACE (3701)**. [Model 1C only] Provides the appropriate cable and interface logic necessary to attach either an external IBM or non-IBM modem with its own clocking for communication over analog facilities or to attach a data service unit for communication over non-switched digital facilities such as the AT&T Dataphone* digital data service network. See [item 3] under "Specify" for cable length. **Limitation**: Cannot be installed with Digital Data Service (DDS) Adapter Feature (#5650) or #5651. **Maximum**: One. **Prerequisite**: Either Common Communications Adapter (#6302) or High Performance Communications Adapter (#6303).

**DIGITAL DATA SERVICE (DDS) ADAPTER (#5650 for Point-to-Point Operation, ... #5651 for Multipoint Operation.)** [Model 1C only] An adapter for BSC or SLDLC data transmission at speeds of 2400, 4800 or 9600 bps over the AT&T non-switched Dataphone* Digital data service. The DDS Adapter interfaces to a DDS channel service unit, the customer site termination of the DDS network. See ‘Note’ below for communication cable length necessary. **Maximum**: #9822 for 2400 bps, #9823 for 4800 bps, or #9825 for 9600 bps. **Maximum**: One #5650 or #5651. **Limitation**: Cannot be installed with External Mode Interface (EMI) or Extended Function Feature. **Field Installation**: Yes. **Prerequisite**: Either Common Communications Adapter (#6302) or High Performance Communications Adapter (#6303).

**COMMON COMMUNICATIONS ADAPTER (#6302).** [Model 1C only] Required for attachment to communication lines at speeds up to 9600 bps (SNA/SLDLC or BSC transmission control protocols) through either an IBM or non-IBM Modem with its own clocking. **Maximum**: One. **Field Installation**: Yes. **Limitation**: High Performance Communications Adapter (#6303) must be ordered/installed in lieu of this feature, if SNA/SLDLC protocol is required with a line speed greater than 7200 bps and a Category B Terminal Adapter(s) (#7802 - 7805) is installed. **[2] This feature cannot be installed with the High Performance Communications Adapter (#6303).**

**HIGH PERFORMANCE COMMUNICATIONS ADAPTER (#6303).** [Model 1C only] When SNA/SLDLC protocol is required with a line speed of 9600 bps and a Terminal Adapter Type B(s) is installed, this feature is required for attachment to the communications cable other than the standard 6.1 meters (20 feet) provided. **Specify**: #9061 for 3.0 meters (10 feet), #9062 for 9.1 meters (30 feet), or #9063 for 12.2 meters (40 feet).

**TERMINAL ADAPTER TYPE A1 thru A3 (#6901, 6902, 6903).** One of each of these adapters can be installed. Each adapter provides for the attachment of an additional eight Category A terminals. The base control unit, which provides for attachment of eight Category A terminals, can be expanded with these three terminal adapters to a maximum configuration of thirty-two Category A terminals. These terminal adapters must be installed in sequence, making it important to order the correct adapter feature code(s).

**TERMINAL ADAPTER TYPE B1 (#7802).** Permits the attachment of four Category B terminals and provides for the installation of Terminal Adapters Types B2, B3 and B4 when additional Category B terminals are desired. **Maximum**: One of each type terminal adapter. **Prerequisite**: #6902 requires #6901 ... #6903 requires #6902. **Field Installation**: Yes.

**TERMINAL ADAPTER TYPE B3 (#7805).** The 3274 Control Unit and Extended Function Store Type C1 (3692) must be installed before this feature can be installed.

**NOTICE**: The 3274 Control Unit and Extended Function Store Type C1 (3692) must be installed before this feature can be installed. See M 3274.4, Jul 79.
3274 Control Unit (cont’d)

features to accurately determine what storage features are required on 3274 models 1A, 1C and 1D in specific configurations.

TERMINAL ADAPTER TYPE B2 THRU B4 (#7803 thru #7805).

Each of these terminal adapters permits the attachment of four additional Category B terminals. A maximum of one each of these terminal adapters can be installed for a combined total of twelve additional or sixteen Category B terminals attached to a control unit. These terminal adapters must be installed in sequence, making it important to order the correct adapter feature code(s).

Field Installation: Yes.

Terminal Adapter Type B2 (terminals 5-8) — #7803
Terminal Adapter Type B3 (terminals 9-12) — #7804
Terminal Adapter Type B4 (terminals 13-16) — #7805

Limitation: Terminal Adapter Type B3 (#7804) and Terminal Adapter Type B4 (#7805) cannot be installed with Terminal Adapter Type A3 (#6903). Maximum: One of each type terminal adapter. Prerequisite: Terminal Adapter Type B3 (#7802) must be installed before these adapters can be installed. Field Installation: Yes.

WATERTIGHT POWER CONNECTOR (#8801). [Models 1A, 1B and 1D only] Provides a watertight connector on the power cable to satisfy local ordinances requiring this type termination in specific locations. See "Specify" for cable length to be ordered. Maximum: One. Field Installation: Not recommended. Limitation: The only valid voltage specify codes are #9884 and #9894. One of these two voltage codes must be specified when ordering this feature.

Special Feature Prices: Special Feature is included in the MLC of the MRC price.

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC</th>
<th>2Yr</th>
<th>Purch</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Storage Expn</td>
<td>#1801</td>
<td>$31</td>
<td>$26</td>
<td>$1,055</td>
</tr>
<tr>
<td>Host Loadable Authorization Matrix</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1A Basic</td>
<td>Basic</td>
<td>Basic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1C(BSC) Cust. Option</td>
<td>Basic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1C(SNA) Basic</td>
<td>Basic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1D Cust. Option</td>
<td>Not Applicable</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CONTROL STORAGE REQUIREMENT FUNCTIONS

APL/Text Control Function: This function, selectable during the customization of a 3274 model 1A, 1C or 1D, expands the character handling capability of the 3274 to accommodate the APL Text and graphic plot character sets for the APL/Text Feature (#1120) on 3278 Display Stations and 3287 Printers attached via Type A Terminal Adapters (#6901, 6902, 6903).

Note: The 3274 Control Unit, with or without this APL/Text control function, does NOT support the 3270 Data Analysis/APL Feature (#1066) on attached 3277 Display Stations or 3284, 3286 or 3287 Printers, NOR does it support the Text Print Feature (#7860) on attached 3288 Line Printers.

3289 Text Print Control Function: This function, selectable during the customization of a 3274 model 1A, 1C or 1D, extends the character handling capability of the 3274 to accommodate the Text characters for the Text Print Feature (#1130) on attached 3289 Line Printers.

Copy Function: This function, selectable during the customization of a 3274 model 1C (BSC) or 1D, enables the copying of the screen contents of an attached 3278 Display Station to an attached 3287 or 3289 printer through use of the Local Print Key on the display keyboard. This function is provided as basic on the 3274 models 1A, 1B and 1C (SNA). The ability to perform host initiated copy operations is possible from a 3278 to a 3278 or 3289 attached to a 3274 model 1A or 1C (SNA) is also provided as basic. In addition, the 3274 model 1C (BSC) supports the 3270 host Copy command as basic.

Local Copy Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>Print Key</th>
<th>Host Initiated</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A</td>
<td>Basic</td>
<td>Basic</td>
</tr>
<tr>
<td>1C(BSC)</td>
<td>Cust. Option</td>
<td>Basic</td>
</tr>
<tr>
<td>1C(SNA)</td>
<td>Basic</td>
<td>Basic</td>
</tr>
<tr>
<td>1D</td>
<td>Cust. Option</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

Host Loadable Authorization Matrix: This function, selectable during the 3274 customization process, provides the capability for the 3274, during subsequent IML procedures, to receive, from a user-written application program at the host CPU, an updated Printer Authorization Matrix to override the matrix created by the customization operator or by system default.

Between Bracket Sharing Function: This function, selectable during the customization of a 3274 model 1A or 1C (SNA), enables attached 3287 and 3289 printers to be used as Local Copy output devices for the screen contents of attached 3278 Display Stations, when the printers are Between Brackets with the host application program. Printers are available for Local Copy operations only when they are not in session with an application program if this option is not selected.

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IBM 3275 DISPLAY STATION Model 2

Purpose: A single remote cathode ray tube display station. Provides controls and display of alphameric information from a S/360 mdl 25, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195 or any S/360 Processor. It is also connected to a 2701 Data Adapter Unit. 2703 Transmission Control or, except for S/360 mdl 25 or 85, a 3704 or 3705 Communications Controller on half-duplex or duplex communications facilities using binary synchronous transmission. It also provides controls and display of alphameric information from any 4300 Processor via a 2701 Data Adapter Unit, or 3704 and 3705 Communications Controller on a half-duplex or duplex communications facilities using binary synchronous transmission. Communication is also possible via a Communications Adapter feature on the 4300 Processor. (Note: This is not supported by ACF/VTAM.)

NOTE: See 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

NOTE: For possible use with 1130, S/360 mdl 20 or System/3, see GSD Manual.

Model 2 Displays 1,920 characters ... 24 lines of 80 characters each.

Highlights: Displays sixty-three 7 x 9 dot matrix characters ... 36 alphameric, 27 special characters, including the space. Features Data-Field Organization, which permits individual fields of data on the screen to be program-defined with various attributes such as protected or unprotected, alphameric or numeric, normal intensity, non-displayed, or brightened intensity, and selector light-pen demand-allowed or disallowed. Display Exception Monitoring Facility (DEMF) a software tool for network problem determination/isolation enhances the availability and serviceability of the 3275 in BSC mode. See DEMF in the Programming/SCP sections for OS/VSI and OS/V2.

Editing Features — typematic, cursor, tab, protected-data, insert and delete, and extended-erase (erase to end-of-field, erase all keyboard input data, erase entire screen) are standard features for displays equipped with a keyboard.

Input Flexibility — a choice of keyboards, a selector light-pen, and a set of program function keys provide unmatched input flexibility ... see "Special Features" below.

Security Enhancement Features — a special Non-displayed Keying Mode (standard) provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification of data on the display unless the key is turned to the "On" position. An Operator Identification Card Reader (optional) is provided to enter system user identification. This enhances the (programmed) control of his access to data and audit of his actions. It may also be used to enter any sequence of characters (pre-recorded on a card) for other purposes such as transaction control, account control, and billing.

Optional features allow the attachment of a 3284 mdl 3 dedicated printer, EBCDIC or ASCII keyboard, selector light-pen, audible alarm and other features ... see "Special Features" below.

Communications: The 3275 may be multi-ported on the same facility with other BSC devices (1800, 2715, 2717, 2730, 3271, 3275 and 3780) as tributary stations on a multipoint line with a S/360 mdl 25-195 (except mdl 44) or any S/370 or 4300 Processor as the control station. Communications with a S/370mdl 115, 125, 135, 135-3 or 138 can be made via the Integrated Communications Adapter (#4640) and appropriate binary synchronous features on the 3115, 3125, 3135, 3135-3 or 3138 (or via the Communications Adapter feature on the 4331. Note: These units are not supported by ACF/VTAM) as well as via the 2701, 2703, 3704 or 3705.

Communications Facilities: The 3275 operates in half-duplex multipoint mode on half-duplex facilities at transmission speeds of 1200 bps, 2400 bps, 4800 bps on facilities D3, D4, D5, X1M or X2M via the 2701, 2703, 3704, 3705, or #4640 on the 3115, 3125, 3135, 3135-3, 3138 using binary synchronous transmission. The 3275 operates in half-duplex multipoint mode on facilities at transmission speeds of 1200 bps, 2400 bps, 4800 bps on facilities D3, D4, D5, X1M or X2M via the 2701, 2703, 3704, 3705, or #4640 on the 3115, 3125, 3135, 3135-3, 3138 using binary synchronous transmission. Half-duplex multipoint operation at a speed of 7200 bps is available on facility D9 via the 2701, 2703, 3704, 3705, or #4640 on the 3115, 3125, 3135, 3135-3, 3138 using binary synchronous transmission. The 3275 operates on switched network facilities at a transmission speed of 600/1200 bps when equipped with feature #3440 using binary synchronous transmission. See GSD Manual for codes for use with System/3.

Modems: One IBM modem may be attached to a 3275.

PREREQUISITE: #7821 is required on the 3275 for speeds over 2400 bps on leased lines.

Modem Speed (bps)

<table>
<thead>
<tr>
<th>Modem</th>
<th>Speed (bps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>363 modl 1</td>
<td>2400/1200</td>
</tr>
<tr>
<td>384 modl 1</td>
<td>4800/2400</td>
</tr>
<tr>
<td>3872 modl 1</td>
<td>2400</td>
</tr>
<tr>
<td>3874 modl 1</td>
<td>4800</td>
</tr>
<tr>
<td>3875 modl 1</td>
<td>7200</td>
</tr>
</tbody>
</table>

NOTES: 4 wire switched network backup is available on the 3863 and 3864 modems. Switched network backup operation is available on the 3872 modl 1, 3874 and 3875. For communications capabilities, product utilization and special features, see M 2700, 2701, 3705, 3863, 3864, 3872, 3874 and 3875 pages.

PREREQUISITES: Transmission via common carrier facility to a 2701, 2703, 3704, 3705 or #4640 on 3115, 3125, 3135, 3135-3, 3138, or a Communications Adapter (#1601) feature on the 4331 requires a modem. See M 2700 pages.

A keyboard must be installed on each 3275 as a diagnostic aid.

System 360/370 or 4300 Processor availability will be restricted unless the using system provides sufficient core to allow diagnostic programs (OLTs) to be executed. For details associated with the required additional core sizes, see the appropriate SRL (TCAM, BTAM and VTAM).

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (115 V AC, 1-phase, wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.


[3] System Attachment: identify the host processor(s) by specifying the following codes:

Note: See GSD manual for codes for use with System/3.

Processor Code Processor Code

<table>
<thead>
<tr>
<th>Processor</th>
<th>Code</th>
<th>Processor</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>S/360 mdl 25</td>
<td>#9571</td>
<td>S/370 mdl 135</td>
<td>#9581</td>
</tr>
<tr>
<td>S/360 mdl 30</td>
<td>#9572</td>
<td>S/370 mdl 138</td>
<td>#9595</td>
</tr>
<tr>
<td>S/360 mdl 40</td>
<td>#9573</td>
<td>S/370 mdl 145</td>
<td>#9582</td>
</tr>
<tr>
<td>S/360 mdl 50</td>
<td>#9576</td>
<td>S/370 mdl 148</td>
<td>#9586</td>
</tr>
<tr>
<td>S/360 mdl 65</td>
<td>#9577</td>
<td>S/370 mdl 155</td>
<td>#9587</td>
</tr>
<tr>
<td>S/360 mdl 67</td>
<td>#9578</td>
<td>S/370 mdl 159</td>
<td>#9588</td>
</tr>
<tr>
<td>S/360 mdl 75</td>
<td>#9579</td>
<td>S/370 mdl 168</td>
<td>#9595</td>
</tr>
<tr>
<td>S/360 mdl 85</td>
<td>#9580</td>
<td>3031 Processor</td>
<td>#9598</td>
</tr>
<tr>
<td>S/360 mdl 155</td>
<td>#9581</td>
<td>3032 Processor</td>
<td>#9597</td>
</tr>
<tr>
<td>S/370 mdl 115</td>
<td>#9583</td>
<td>3033 Processor</td>
<td>#9597</td>
</tr>
<tr>
<td>S/370 mdl 125</td>
<td>#9586</td>
<td>4331 Processor</td>
<td>#9066</td>
</tr>
<tr>
<td>S/370 mdl 125</td>
<td>#9587</td>
<td>4341 Processor</td>
<td>#9067</td>
</tr>
</tbody>
</table>

[4] Transmission Code: Specify one: #9761 -- for EBCDIC Transmission Code (available at time of manufacture only) ... utilizes 8-bit EBCDIC code over the transmission facilities ... used in conjunction with EBCDIC Character Set (#9091). #9762 -- for ASCII Transmission Code (available at time of manufacture only) ... utilizes 8-bit ASCII code over the transmission facilities ... used in conjunction with ASCII Character Set (A) (#9091) or (B) (#9092).

[5] Character Set: Specify one of the following:

- #9091 -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard. PREREQUISITE: EBCDIC Transmission Code (#9761).

- #9091 -- for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but substitutes the Logical OR (I) and Logical NOT (N) ... provides the 64 ASCII characters but substitutes the Logical OR (I) and Logical NOT (N) ... provides the 64 ASCII character set. PREREQUISITE: ASCII Transmission Code (#9762).


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IBM 3275 Display Station Model 3

Model Upgrade Purchase Prices (there are no additional installation charges.)

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>$2,505</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Special Features

Audible Alarm (#1090). An alarm, sounded under program control, to alert the operator to a special condition. This alarm, during keyboard operation, is sounded when a character is entered into the next to last position on the screen. Maximum: One.

DIAL (#3440). [Available at time of manufacture only] Provides the capability of operating over switched communications facilities at speeds of 600/1200 bps. Limitation: Mutually exclusive with Transmission Speed #7820 and #7821.

Operator Identification Card Reader (#4600). Provides the capability of reading in a 3-1/8 inch (53.9 mm x 85.7 mm) plastic data processing card with an encoded magnetic stripe. Using the 10-character numeric set, the number of characters that can be read is 1.37 characters at 75 BPI (bits per inch).

Maximum: One. Field Installation: Yes. Prerequisite: Any Keyboard.

Keyboard (#4630 - 4636).

#4630 — 66 key EBCDIC Typewriter Keyboard, typewriter-like layout, movable, with 45 alphameric keys and 21 control keys. Prerequisite: EBCDIC Character Set (#9089).

#4631 — 66 key EBCDIC Data Entry Keyboard, movable, with 36 alphameric keys and 30 control keys. Prerequisite: EBCDIC Character Set (#9089).

#4632 — 78 key Operator Console Keyboard, operator-console layout, movable, with 45 alphameric keys, 21 control keys, and 12 program function keys. Prerequisite: EBCDIC Character Set (#9089).

#4633 — 78 EBCDIC Typewriter Keyboard, 66 key EBCDIC layout with 12 additional program function keys, movable. Prerequisite: EBCDIC Character Set (#9089).

#4634 — 66 key ASCII Keyboard, ASCII typewriter layout, movable, with 45 alphameric keys and 21 control keys. Prerequisite: ASCII Character Set (A or B) (#9091 or #9092).

#4635 — 78 key ASCII Keyboard, 66 key ASCII typewriter layout, with 12 additional program function keys, movable. Prerequisite: ASCII Character Set (A or B) (#9091 or #9092).

#4636 — 66 key EBCDIC Data Entry Keyboard, keypunch layout, movable, with 36 alphameric keys and 30 control keys. This is the recommended keyboard for data entry, including Video 370. Prerequisite: EBCDIC Character Set (#9089).

Maximum: One of the above. Field Installation: Yes.

Keyboard Numeric Lock (#4690). Provides the ability to lock the keyboard, if a non-numeric key (other than 0-9, minus (-), period (.), or dup) is depressed in a predefined numeric-only field. Maximum: One. Field Installation: Yes.

1200 BPS INTEGRATED MODEM (#5500). Provides a modem capable of operation at a speed of 1200 bps on non-switched communications facilities or at speeds of 600/1200 bps on the switched communications facilities via a similarly equipped 2701, 3705 or Communications Adapter on 4331 Processor. Field Installation: Yes. Prerequisite: Dial (#3440) on the switched communications facilities. Transmission Speed (#7820) on non-switched communications facilities.

1200 BPS INTEGRATED MODEM WITH AUTO ANSWER (#5501). Provides a modem with automatic answering for use with the switched telephone network at speeds of 600/1200 bps via a similarly equipped 2701, 3705 or Communications Adapter on 4331 Processor. Field Installation: Yes. Prerequisite: Dial (#3440).

Printer Adapter (#5550). To attach a 3284 Printer mdl 3. Provides the controls to print out the contents of the 3275 buffer. Used with the basic 3275. Maximum: One. Field Installation: Yes.

Security Keylock (#6540). A lock and key which prevents modification and display of data on the display when in the 'off' position. Maximum: One. Field Installation: Yes.

Selector Light-Pen (#6350). A hand-held, pen-like device that permits the operator to select fields of data from a display for computer input. Maximum: One. Field Installation: Yes.

Transmission Speed (#7820, 7821). 7820 — for transmitting over communications facilities at 1200 bps. Clocking is provided by the 3275. #7821 — for transmitting at speeds of 4800 or 7200 bps. Clocking provided by modem. Field Installation: Yes. Maximum: One. Limitations: Mutually exclusive with Dial (#3440).

IBM 3275 Display Station Model 3

Purpose: A single remote cathode ray tube display station for use in the 3650 Programmable or Retail Store System. Provides control and display of alphanumeric data from an IBM 3650 Store Controller utilizing a 2400 bps Loop communications facility. See the 3650 Programmable or Retail Store System description for communications facility details.

Highlights: Displays 1,920 characters ... See Special Features below.

Edit Features — Tympanic cursor, tab, back-tab, protected-data, insert and delete, and extended-erase (erase to end-of-field, erase all keyboard input data, erase entire screen) are standard features.

Input Flexibility — The keyboard provides a set of three program action keys and five program function keys for input flexibility.

Security Enhancement Features — A special non-displayed keying mode (standard) provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification of data on the display screen unless the key is turned to the "On" position.

Optional features allow the attachment of a 3284 mdl 3 dedicated printer, an audible alarm, and the Security Keylock ... See Special Features below.

Communications: The 3275 mdl 3 may be attached to the Loop of the 3650 Programmable or Retail Store System along with the other types of terminals supported in that system.

Communicates only with a 3651 Store Controller mdl 25, 50 or 75. The 3275 mdl 3 includes the Loop Adapter and a 15 foot cable for attachment to the Loop as described in the 3650 Programmable or Retail Store System description.

Maximum: The maximum number of 3275 mdl 3s that can be attached to a 3651 mdl 25, 50 or 75 depends upon the number of positions available and the traffic volumes and response times required.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): $9880 for locking plug, or $9881 for non-lock plug.

[2] Keyboard: A 66 key EBCDIC Data Entry Keyboard (#4631) must be installed on each 3275 mdl 3.


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IBM 3275 Display Station Model 3 (cont'd)

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MAC/ MLC</th>
<th>MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3275</td>
<td>3</td>
<td>$104</td>
<td>$157</td>
<td>$4,935</td>
</tr>
</tbody>
</table>

**Plan Offering:** Plan B  
**Warranty:** B  
**Machine Group:** A  
**Purchase Option:** 60%  
**Per Call:** 1  
**Termination Charge Months:** 5  
**Termination Charge Percent:** 25%  
**Upper Limit Percent:** 5%

**Model Changes:** 3275 model 3 cannot be changed in the field from or to model 1 or 2.

**SPECIAL FEATURES**

**AUDIBLE ALARM** (#1090). An alarm, activated under program control, to alert the operator to a special condition. This alarm, during keyboard operation, is sounded when a character is entered into the next to last position on the screen. **Maximum:** One.  
**Field Installation:** Yes.

**KEYBOARD (#4631).** 66 Key EBCDIC Data Entry Keyboard, key-punch like layout, movable, with 36 alphanumeric keys and 30 control keys. **Maximum:** One. **Field Installation:** Yes.

**KEYBOARD NUMERIC LOCK (#4690).** Provides the ability to lock the keyboard if a non-numeric key (other than 0-9, minus (-), period (.), or dup) is depressed in a predefined numeric-only field. **Maximum:** One. **Field Installation:** Yes.

**PRINTER ADAPTER (#5550).** To attach a 3284 Printer mdl 3. Provides the controls to print out the contents of the 3275 mdl 3 buffer. **Maximum:** One. **Field Installation:** Yes.

**SECURITY KEYLOCK (#6340).** A lock and key which prevents modification and display of data on the display when in the "off" position for additions or replacement keys. **Maximum:** See M 10000 pages.  
**Maximum:** One. **Field Installation:** Yes.

**TRANSMISSION SPEED, 9600 BPS (#7825).** Provides for transmission at 9600 bps over a local Loop on a 3651 mdl A50, B50. **Maximum:** One. **Field Installation:** Yes. **Prerequisite:** 9600 bps Loop Adapter (#4890) on the 3651 mdl A50 or B50.

**IBM 3275 DISPLAY STATION Model 12** [Remote Attachment]

**Purpose:** A single remote cathode ray tube display station. Provides controls and display of alphanumeric information from an S/370 or 4300 Processor via a 3704 or 3705 Communications Controller on half-duplex or duplex communications facilities using Synchronous Data Link Control (SDLC) transmission. Communication is also possible via a Communications Adapter feature on the 4331 Processor (Note: This is not supported by ACF/VTAME).  
**NOTES:** See the 3704/3705 and 4331 Processor Code/Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

**Model 12 Displays** 1,920 characters ... 24 lines of 80 characters each. The basic unit will transmit EBCDIC transmission code at line speeds of 2000 to 9600 bps.

**Highlights:** Displays sixty-three 7 x 9 dot matrix characters ... 36 alphanumeric, 27 special characters, including the space. Features Data-Field Organization, which permits individual fields of data on the screen to be program-defined with various attributes such as protected or unprotected, alphanumeric or numeric, normal intensity, non-displayed, or brightened intensity, and selector light-pen detection-allowed or disallowed.

**Editing Features** - typamatic cursor, tab, back-tab, protected-data, insert and delete, and extended erase (erase to end-of-field, erase all keyboard input data, erase entire screen) are standard features for displays equipped with a keyboard.

**Input Flexibility** - a choice of keyboards, a selector light-pen, and a set of program function keys provide unmatched input flexibility ... see "Special Features" below.

**Security Enhancement Features** - a special Non-displayed Keying Mode (standard) provides for fields of data to be program-defined so that they will be displayed if entered from the keyboard when the data is displayed on the screen. A Security Keylock (optional) prevents modification of data on the display unless the key is turned to the "On" position. An Operator Identification Card Reader (optional) is provided to enter system user identification. This enhances the (programmed) control of his access to data and audit of his actions. It may also be used to enter any sequence of characters (pre-recorded on a card) for other purposes such as transaction control, account control, and billing.

Optional features allow the attachment of a 3284 mdl 3 dedicated printer, EBCDIC or ASCII keyboard, selector light-pen, audible alarm and other features ... see "Special Features" below.

**Communications:** The 3275 mdl 12 may be multitedropped on the same facility with other S/370 devices on a multipoint or a duplex-multipoint line with any S/370 or 4300 Processor as the control station.

**Communications Facilities:** The 3275 mdl 12 operates in half-duplex multipoint mode on half-duplex facilities at transmission speeds of 1200, 2000 or 2400 bps via the 3704, 3705 or Communications Adapter on the 4331 Processor using SDLC transmission. The 3275 mdl 12y operate in half-duplex multipoint mode or in duplex multipoint mode on duplex facilities at transmission speeds of 1200, 2000, 2400, 4800, 7200 or 9600 bps via the 3704, 3705 or Communications Adapter on the 4331 Processor using SDLC transmission. See M 2700 and M 3704/3705 and M 4331 sales manual pages.

**Modems:** One IBM modem may be attached to a 3275 mdl 12.

**Modem Speed (bps) -- 3861, 3864 and 3865 modems:** Manual switched network backup is available on 3863, 3864 and 3865 modems. For communications capabilities, product utilization and special features, see M 2700, 3863, 3864, 3865, 3872, 3874 and 3875 pages.

**FEATURES:** (1) Transmission via communications facilities to a 3704, 3705 or Communications Adapter on the 4331 Processor requires a modem. Clocking for 1200 bps is provided by the 3275. Clocking above 1200 bps is provided by the modem ... (2) A keyboard must be installed on each 3275 mdl 12 as a diagnostic aid.

**Bibliography:** See KWIC Index, G320-1621 or specific system bibliography.

**SPECIFY:** [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.  
[2] Cables: Cable to attach modem should be ordered. Refer to 3270 Installation Manual - Physical Planning, GAZ7-2787, for cable information.

**[3] System Attachment:** identify the host processor(s) by specifying the following codes;

<table>
<thead>
<tr>
<th>Processor</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>S/370 mdl 115</td>
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<td>S/370 mdl 155</td>
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<tr>
<td>S/370 mdl 175</td>
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<tr>
<td>S/370 mdl 195</td>
<td>9585</td>
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</tr>
<tr>
<td>S/370 mdl 215</td>
<td>9585</td>
<td>9590</td>
</tr>
</tbody>
</table>

**[4] Character Set:** Specify one of the following:

| Character Set (A) (available at time of manual publication) | Provides the 64 ASCII characters described on the EBCDIC typewriter keyboard. |
| Character Set (B) (available at time of manual publication) | Provides the standard 64 ASCII character set. |

**PREREQUISITES:**

- (1) Transmission via communications facilities to a 3704, 3705 or Communications Adapter on the 4331 Processor requires a modem. Clocking for 1200 bps is provided by the 3275. Clocking above 1200 bps is provided by the modem ... (2) A keyboard must be installed on each 3275 mdl 12 as a diagnostic aid.

**Bibliography:** See KWIC Index, G320-1621 or specific system bibliography.

**SPECIFY:** [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.  
[2] Cables: Cable to attach modem should be ordered. Refer to 3270 Installation Manual - Physical Planning, GAZ7-2787, for cable information.

**[3] System Attachment:** identify the host processor(s) by specifying the following codes;

<table>
<thead>
<tr>
<th>Processor</th>
<th>Code</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>S/370 mdl 115</td>
<td>9589</td>
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<td>S/370 mdl 215</td>
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</tr>
</tbody>
</table>

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| Character Set (A) (available at time of manual publication) | Provides the 64 ASCII characters described on the EBCDIC typewriter keyboard. |
| Character Set (B) (available at time of manual publication) | Provides the standard 64 ASCII character set. |

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AUDIBLE ALARM (#1090). An alarm, sounded under program control, to alert the operator to a special condition. This alarm, during keyboard operation, is sounded when a character is entered into the next to last position on the screen. Maximum: One. Field Installation: Yes.

ASCII TRANSMISSION CODE (#1200). Utilizes 8-bit ASCII Code over transmission facilities. Used in conjunction with ASCII Character Set (A) (#9091) or ASCII Character Set (B) (#9092). Field Installation: Available at time of manufacture only.

OPERATOR IDENTIFICATION CARD READER (#4600). Provides the capability of reading a 2-1/8" x 3-3/8" (53.9mm x 85.7mm) plastic card with an encoded magnetic stripe. Using the 10-bit numeric character set, the number of characters that can be read is 1-37 characters at 75 BPI (bits per inch).

Maximum: One. Field Installation: Yes. Prerequisite: Any keyboard.

KEYBOARDS (#4630 thru 4636).

- #4630 -- 66 key EBCDIC Typewriter Keyboard, typewriter-like layout, movable, with 45 alphameric keys and 21 control keys.
- #4631 -- 66 key EBCDIC Data Entry Keyboard, movable, with 36 alphameric keys and 30 control keys.
- #4632 -- 78 key EBCDIC Operator Console Keyboard, operator-console layout, movable, with 45 alphameric keys, 21 control keys and 12 program function keys.
- #4633 -- 78 key EBCDIC Typewriter Keyboard, movable, with 66 key EBCDIC layout and 12 additional program function keys.
- #4634 -- 66 key ASCII Keyboard, ASCII typewriter layout, movable, with 45 alphameric keys and 21 control keys. Prerequisite: ASCII Character Set (A) (#9091) or (B) (#9092).
- #4635 -- 78 key ASCII Keyboard, 66 key ASCII typewriter layout, with 12 additional function keys, movable. Prerequisite: ASCII Character Set (A) (#9091) or (B) (#9092).
- #4636 -- 66 key EBCDIC Data Entry Keyboard, keypunch layout, movable, with 36 alphameric keys and 30 control keys.

Maximum: One of the above. Field Installation: Yes.

KEYBOARD NUMERIC LOCK (#4690). Provides the ability to lock the keyboard if a non-numerical key [other than 0-9, minus (-), period (.) or dup] is depressed in a predefined numeric-only field. Maximum: One. Field Installation: Yes.

1200 BPS INTEGRATED MODEM (#5500). Provides a modem capable of operating at a speed of 1200 bps on non-switched communications facilities via a similarily equipped 3704, 3705 or Communications Adapter on the 4331 Processor. Maximum: One. Field Installation: Yes. Prerequisite: Transmission Speed (#7820).

PRINTERS ADAPTER (#5550). To attach a 3284 Printer mod 3. Provides the controls to print out the contents of the 3275 md1 12 buffer. Used with the basic 3275 md1 12. Maximum: One. Field Installation: Yes.

SECURITY KEYLOCK (#6340). A lock and key which prevents modification and display of data on the display when in the "off" position. Maximum: One. Field Installation: Yes.

SELECTOR LIGHT-PEN (#6350). A hand-held, pen-like device that permits the operator to select fields of data from a display for computer input. Maximum: One. Field Installation: Yes.


Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/MLC</th>
<th>MRC</th>
<th>2 yr</th>
<th>Purch</th>
<th>MMMC</th>
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<tr>
<td>Audible Alarm</td>
<td>#1090</td>
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<td>$ 3</td>
<td>$ 14</td>
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<td>ASCII Transmission Code</td>
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<td>7</td>
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<td>11</td>
<td>437</td>
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<td>Keyboard</td>
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<td></td>
<td>66 Key EBCDIC Data Entry (Keypunch layout)</td>
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<td>13</td>
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</table>

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IBM 3276 CONTROL UNIT DISPLAY STATION

Purpose: An enhanced, cathode-ray tube (CRT), display station used for displaying alphanumeric data, and for entering data into and receiving data from a S/360, a S/370, a 3430 Processor, a 3790 Communication System or an 8100 System. The 3276 optionally provides control and multiplexing capabilities to support up to seven 3276 Display Stations or 3279 Printers or 3298 Line Printers, allowing a maximum cluster size of eight displays or printers including the 3276's own display. A keyboard, or a selector light-pen permit an operator to display and manipulate data on the screen in a flexible and efficient manner. The 3276 meets both general and unique display requirements with its set of basic and optional features.

The 3276 communicates: with a S/370 or 4300 Processor using Synchronous Data Link Control (SDLC) or Binary Synchronous Communication (BSC) over communications facilities, or with a S/360, S/370 or 4300 Processor using BSC over communications facilities; or communicates with a 3790 Communication System using SDLC over communications facilities; or with an 8100 System using SDLC via a communication link, or a direct or data link attached loop.

For possible use with System/3, see GSD manual.

Models 1 through 4 -- for use with BSC transmission control.

Model 1 Displays up to 960 characters ... 12 lines of 80 characters each. Can attach up to seven 3276 mdls 1b, 3287s (mdls 1 and 2) or 3298s (mdls 1 and 2) in any combination.

Model 2 Displays up to 1920 characters ... 24 lines of 80 characters each. Can attach up to seven 3276 mdls 1 and 2, 3287s (mdls 1 and 2) or 3298s (mdls 1 and 2) in any combination.

Model 3 Displays up to 2560 characters ... 32 lines of 80 characters each. Can attach up to seven 3276 mdls 1, 2 and 3, 3287s (mdls 1 and 2) or 3298s (mdls 1 and 2) in any combination.

Model 4 Displays up to 3440 characters ... 43 lines of 80 characters each. Can attach up to seven 3276s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3298s (mdls 1 and 2) in any combination.

Models 11 through 14 -- for use with SNA/SDL transmission control.

Model 11 Displays up to 960 characters ... 12 lines of 80 characters each. Can attach up to seven 3278s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3298s (mdls 1 and 2) in any combination.

Model 12 Displays up to 1920 characters ... 24 lines of 80 characters each. Can attach up to seven 3278s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3298s (mdls 1 and 2) in any combination.

Model 13 Displays up to 2560 characters ... 32 lines of 80 characters each. Can attach up to seven 3278s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3298s (mdls 1 and 2) in any combination.

Model 14 Displays up to 3440 characters ... 43 lines of 80 characters each. Can attach up to seven 3278s (mdls 1, 2, 3 and 4), 3287s (mdls 1 and 2) or 3298s (mdls 1 and 2) in any combination.

NOTE: Models 1 and 11 have a 480 character mode for existing 480 character programs, and models 3, 4, 13 and 14 have a 1920 character mode to accommodate existing 1920 character programs.

For use with the 3790 Communication System: The 3791 Controller supports selected models of the 3276 in 1920 character mode. See the 3791 Configurator, GA27-2768-6, and 3791 Machine Pages for additional information.

For use with an 8100 Information System: See the 8100 System configurator, GA27-2876 8100, and refer to the 8130/8140/8101 Machines and Programming pages for possible support restrictions.

Highlights: Displays a character within a 7 x 14 character matrix in 960, 1920 and 2560 character models; within a 7 x 11 character matrix in the 3440 character model. The basic 26 character upper case letters are presented in a 7x9 character matrix for the 960, 1920 and 2560 character models, and in a 7x9 character matrix for the 3440 character model. Displays 62 alphanumeric and 32 special characters, not including the Space and Null characters. The display is set up to accommodate upper case letters by the monochrome switch. Uses 3270 Field Formatting capability which permits individual fields of data on the screen to be program defined with various attributes such as protected/unprotected, alphanumeric, normal/highlighted intensity, displayable/non-displayable, and selector light-pen detection allowed/disallowed. The operator may initiate a local display-to-printer copy function (i.e., without host intervention) from the keyboard of a 3276 or 3278 attached to a 3276. The printer designation is controlled by a configuration default matrix which is fixed by the relative port positions of displays and printers attached to the 3276. Other displays and printers are attached to the 3276 by using the IDENT key. All terminals attached to a 3276 can be driven at distances of up to 1500 meters (4920 feet).

Devices attached to the 3276 are assigned port positions 1 through 4. Displays are authorized to print only to printers which are attached to higher numbered ports. If the IDENT key is not used, a PRINT operation from a given display will cause printing to take place at the first printer whose port position is higher than the display. The operator may use the IDENT key to print to any printer. (The host can perform copy in a manner compatible with existing 3271/3272 support).

Operator Factors -- the 3276 has a non-glare screen. Indicators are displayed on the bottom row of the screen, outside the data display area, and provide useful operator information. Host display of data on the screen is accomplished without refresh interrupt (i.e., no blinking). The keyboard which is low in profile provides a palm rest area and has separators to help prevent accidental smudging of control keys. The operator may select one of several cursor modes.

Cluster Capability -- up to seven 3278s, 3287s or 3298s may be attached. The basic 3276 provides a display and a port for one device, a 3278, 3287 or 3289. Up to three Terminal Adapters, each controlling up to two devices, can be attached to the 3276. The 3276 allows the attachment of seven additional displays and/or printers for a maximum cluster size of eight including its own display ... see "Special Features" below.

Editing Functions -- cursor move, tab, home key, back tab, insert, delete, extended erase (erase to end-of-field, erase all keyboard input data, and erase entire screen), and cursor select keys are all basic. All alphanumeric, special symbol, and cursor move keys have typamatic capability. Double speed cursor typamatic is attained with a simultaneous depressing of the ALT key and horizontal cursor positioning key. The cursor select function provides an alternative to the Selector Light-pen function. Fields of data may be selected by positioning the cursor and then using the Cursor Select Key.

Input Flexibility -- a choice of keyboards or the selector light-pen provide input flexibility ... see "Special Features" below. Fields of data can be selected by positioning the cursor and operating the cursor select key, instead of using the Selector Light-Pen. Twelve program function (P.F.) keys are basic with all typewriter keyboards.

Security Functions -- a special non-displayed input mode provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock prevents modification or display of data in the display buffer unless turned on by the "on" position. An Address Keylock (optional) controls access to the address switches. These capabilities and the terminal's ability to identify itself to the host (SDLC operation only), allow customer-supplied security program routines to control access to data and audit of actions. A Magnetic Slot Reader is available to enter input identification. An Encrypt/Decrypt feature (optional) protects data transmitted over unsecured communications lines from accidental or intentional disclosure and/or modification (models 11, 12, 13 and 14 in S/370 or 4300 Processor attachment only).

Communications: The 3276 mdls 11 - 14, and the 3276 mdls 1 - 4 with the SDLC/BSC Switch (#6315) communicate with a S/370 or 4300 Processor using Synchronous Data Link Control (SDLC) transmission over communications facilities to a 3704/3705 Communications Controller, or a Communications Adapter feature (#1601) on the 4331. The 3276 mdls 1 - 4 communicate with a S/360, S/370 or 4300 Processor using Binary Synchronous transmission over communications facilities to, where applicable, a 2701 Data Adapter Unit, a 2703 Transmission Control, a 3704/3705 Communications Controller, or an Integrated Communications Adapter (S/370 mdls 115, 125, 135 or 138), or a Communications Adapter feature (#1601) on a data transmission system. Selected models of the 3276 communicate with the 3790 Communication System using Synchronous Data Link Control (SDLC) transmission over communications facilities. See Special Features pages for specific models. All models of the 3276 can also communicate with a 3704/3705 Communications Controller or a Communications Adapter feature (#1601) on a data transmission system. See Special Features pages for specific models.
3276 Control Unit Display Station (cont'd)

duplex point-to-point or multipoint mode on half-duplex or duplex facilities at transmission speeds of 1200/600, 2000, 2400/1200, 4800/2400, 3200/1600, and 9600 (SNA/SDLC only) bps on non-switched facilities D3, D3M, D3SS, D4, D4M, D4SS, D5, D5M, D5SS, D6, D6M, D6SS, D7, D7M, D7SS, X1, X1M, X2, X2M, X3 and X3M. In two or more linked half-duplex point-to-point mode at transmission speeds of 1200/600, 2400/1200 and 4800/2400 bps on switched facilities C4, C4M, C5, C5M, C6, C6M, C6M2, and C6M3. See M 2700 pp 1. The 3276 mod 11s 1, 12, 13, and 14 operate in half-duplex mode at 9600 bps over a direct attached loop, and at 2400 bps over a data link attached loop. For details, see M 10000 pages.

Modems: If a Digital Data Service (DDS) Adapter (#$650 or #$651) is not installed, a 1200 bps Integrated Modem feature or an external IBM modem may be attached to a 3276. External modems require the External Modem Interface (#3701).

- Modem Speed (bps)
  - 3863 mod 1, j 2400/1200
  - 3864 mod 1, j2 4800/2400
  - 3865 mod 1, j2 9600/4800
  - 3872 mod 1j 2400/1200
  - 3874 mod 1j 4800/2400
  - 3875 mod 1j 7200/3600

4 wire switched network backup is available on 3863, 3864 and 3865 modems. Switched network backup operation with Manual Call and Manual Answer, is available on the 3872 mod 1j1, 3872 mod 1j2, 3872 mod 1j3, and 3872 mod 1j4. Modems: C4, C4M, C5, C5M, C6, C6M. See M 2700 pp 1.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. Customer Responsibility below for network problem determination/isolation enhances the availability and serviceability of the 3276 in non-CSU situations for network backup operation with Manual Call and Manual Answer, is available on the 3872 mod 1j1, 3872 mod 1j2, 3872 mod 1j3, and 3872 mod 1j4. Modems: C4, C4M, C5, C5M, C6, C6M. See M 2700 pp 1.

Customer Responsibilities: The customer is responsible for:
- Adequate site, system and other vendor preparation.
- Receipt at customer's receiving dock, unpacking and placement of 3276.
- Physical set-up, connection of cables to TP lines/modems and IBM devices incorporating protected customer access areas, switch settings, and check out.
- Contact Field Engineering to make cable connections of IBM CSU units to non-CSU units where customer access areas are not provided.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.
- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removal to the customer's shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.

PREREQUISITES: The 3276 requires an integrated or external modem or DDS Adapter for TP attachment.

A keyboard is needed on each 3276 for diagnostic purposes. See KWIC Index, G320-1621, or specific system bibliography.

SPECIFY: [1] Voltage (120 V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug. If standard 2.8 meter (9 foot) power cable is not desired, specify #9511 for 1.8 meter (6 foot) cable, #9512 for 3.7 meter (12 foot) cable, or #9513 for 4.5 meter (15 foot) cable.

[2] Communication Cable: A 6.1 meter (20 foot) communication cable is provided as standard for attachment to a standalone modem, or to a communication facility when a DDS Adapter or an integrated modem is used. If standard 6.1 meter (20 foot) communication cable is not desired, specify: #9061 for 3.0 meter (10 foot) cable, #9062 for 9.1 meter (30 foot) cable, or #9063 for 12.2 meter (40 foot) cable. A 1.8 meter (6 foot) communication cable (station card or cable) provided as standard for attachment to a direct or data link attached loop. If standard cable is not desired, specify #9405 for 4.3 meter (14 foot) cable.

[3] Character Set: Specify one;

#9082 -- for EBCDIC character set -- used in conjunction with 75 Key Typewriter Keyboard (#4821), Data Entry Keyboard (#4622 or #4623), 87 Key EBCDIC Typewriter Keyboard (#4627), EBCDIC Typewriter/APL Keyboard (#4628), or EBCDIC Typewriter/Text Keyboard (#4629).

#9084 -- for ASCII Character Set (B) -- used in conjunction with 75 Key ASCII Typewriter Keyboard (#4624), or 87 key ASCII Typewriter Keyboard (#4628).

[4] System Attachment: Identify the host processor(s) by specifying the following codes: (Note: See GSD manual for codes for use with System/3.)

Processor Code Processor Code

2030 #9572 3148 #9596
2040 #9573 3155 3155 II #9583
2050 #9575 3158, 3158MP #9587
2065 #9576 3165, 3165 II #9584
2075 #9577 3168, 3168MP #9588
3115 #9589 3195 #9580
3125 #9586 3031 #9599
3135 #9581 3032 #9598
3138 #9595 3033 #9597
3145 #9582 3791 #9253
3146 4331 #9006
3431 4341 #9607
8100 System #9000

[Special Features]

ADDRESS KEYLOCK (#1009). Controls access to the unit address switches (and transmit level switches) which are located in the Operator Panel Drawer. Maximum: One. Field Installation: Yes.

APLICATION TEXT CONTROL (#1067). Provides the control for 3276, 3278, or 3287 with APL/Text feature or 3289 with Text Print feature. Maximum: One. Field Installation: Yes. Prerequisite: Extended Function Base (#1068).


AUDIBLE ALARM (#1090). An alarm, sounded under program control, to alert the operator to a specific condition. This alarm, during keyboard operation, is also sounded when a character is entered into the next-to-last position on the screen. The operator may adjust the volume of the tone. Maximum: One. Field Installation: Yes.

APLICATION TEXT (#1120). Provides the capability for display of the 222 character APL/Text set including the 94 character EBCDIC Set. Maximum: One. Field Installation: Yes. Prerequisites: Extended Function Base EBCDIC Typewriter/APL Keyboard (#4628) or 87-key EBCDIC Typewriter/Text Keyboard (#4629). Limitations: This feature is only valid when installed with the APL/Text Control (#1067). This feature is EBCDIC only and is NOT compatible with ASCII. Prerequisite: Extended Character Set Adapter (#3610); EBCDIC Character Set specify #9082.

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TERMINAL ADAPTER (#3255, 3256, 3257).

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= =

tion of the Federal Data Encryption Standard algorithm to encrypt

Installation: Yes. Corequisite: APL/TEXT (#1120). Prerequisite:

EXTENDED

ENCRYPT /DECRYPT

port for attaching one terminal, a 3278, 3287 or 3289. The 3276

additional or replacement battery. Replacement of the discharged

diagnostic testing.

A battery is shipped with this feature.

A mercury battery,

installation: Yes. Prerequisite: Security Keylock (#6340). Note:

---

#3255 - Terminal Adapter No.1, enables attachment of

#3256 -- Terminal Adapter No.2, enables attachment of two

#4622 - 75 key Data Entry Keyboard ... movable, with 35 data

key tops to allow entry of 65 Text specific characters in

maximum cluster size of eight displays or printers.


ENCRYPT/DECRYPT (#3680). Provides a hardware implementation of the Federal Data Encryption Standard algorithm to encrypt and decrypt data messages under a 56-bit key variable. When used in conjunction with the ACF/VTAM Encrypt/Decrypt feature (Feature Number 6010, Program Number 5735-RC2) and the IBM Programmed Cryptographic Facility Program Product (Program Number 5740-XF5), data transmitted over unprotected communications lines can be safe-guarded through cryptography. Limitations: 3276 mdls 11, 12, 13 and 14 only. Cannot be installed with Extended Function Base (#1068).

Maximum: One. Field Installation: Yes. Prerequisite: Security Keylock (#3640). Note: A mercury battery, IBM part no. 1743456, is equivalent to a lead. A battery is shipped with this feature. See M10000 pages for additional or replacement battery. Replacement of the discharged battery is the customer’s responsibility. The discharged battery should be returned to IBM.

KEYBOARD (#4621 - 4629).

One is needed on each 3276 for diagnostic testing.

#4621 -- 75 key Typewriter Keyboard ... typewriter-like layout, movable, with 49 data keys and 26 control keys. 12 program function keys are included in the top row of data keys through use of an alternate shift key. Prerequisite: EBCDIC Character Set (#9082).

#4622 -- 75 key Data Entry Keyboard ... movable, with 35 data keys, 10 program function keys and 30 control keys. This is the recommended keyboard for high volume data entry. Prerequisite: EBCDIC Character Set (#9082).

#4623 -- 75 key Data Entry Keyboard ... keypunch layout, movable, with 35 data keys, 10 program function keys and 30 control keys. This is the recommended keyboard for high volume data entry. Prerequisite: EBCDIC Character Set (#9082).

#4624 -- 75 key ASCII Typewriter Keyboard ... ASCII typewriter layout, movable, with 49 data keys and 26 control keys. 12 program function keys are included in the top row of the data keys through use of an alternate shift key. Prerequisite: ASCII Character Set (B) (#9084).

#4626 -- 87 key EBCDIC Typewriter/APL Keyboard ... an 87-key EBCDIC Typewriter keyboard (ref #4627) with modified keytops to allow entry of 81 APL specific characters in addition to the 94 character EBCDIC set. An APL On/Off key controls whether the keyboard is in EBCDIC typewriter or APL mode. In contrast to the 87-key EBCDIC typewriter keyboard without APL (ref #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are a group of twelve keys to the right of the main keyboard area. Prerequisites: APL/Text (#1120); EBCDIC Character Set (#9082).

#4627 -- 87 key EBCDIC Typewriter Keyboard ... typewriter-like layout, movable, with 49 alphabetic data keys, 26 control keys, and 12 program function keys (24 total P.F. keys). Twelve of the program function keys are included in the top row of data keys through the use of an alternate shift key. Prerequisite: EBCDIC Character Set (#9082).

#4628 -- 87 key ASCII Typewriter Keyboard ... ASCII typewriter-like layout, movable, with 49 alphabetic data keys, 26 control keys, and 12 program function keys (24 total P.F. keys). Twelve of the program function keys are included in the top row of data keys and are available through the use of an alternate shift key. Prerequisite: ASCII Character Set (B) (#9084).

#4629 -- 87 key EBCDIC Typewriter/Text Keyboard ... an 87-key EBCDIC typewriter keyboard (ref #4627) with modified keytops to allow entry of 65 Text specific characters in addition to the 94 character EBCDIC set. A Text On/Off key controls whether the keyboard is in EBCDIC typewriter or Text mode. In contrast to an 87-key EBCDIC typewriter keyboard without Text (ref #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are a group of twelve keys to the right of the main keyboard area. Prerequisites: APL/Text (#1120); EBCDIC Character Set (#9082).

Maximum: One. Field Installation: Yes. The keyboard is set up by the customer. Specify: If standard 0.9 meter (3 foot) keyboard cable is not desired, specify #9399 for 1.8 meter (6 foot) cable. Limitation: Keyboards used on 3276/3277 machines are not interchangeable with keyboards used on 3276/3278 machines.

KEYBOARD NUMERIC LOCK (#4690). Provides any Keyboard with the ability to lock the keyboard if a non-numeric key [other than 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, plus, (-), decimal sign, or dup] is depressed in a pre-defined numeric-only field. Maximum: One. Field Installation: Yes.

MAGNETIC READER CONTROL (#4999). Provides the capability of attaching a Magnetic Slot Reader which reads encoded information (numeric only) from a magnetic stripe. Maximum: One; Field Installation: Yes.

SDLC/BSC SWITCH (#3615). [Mdl 1 - 4 only] Provides SNA/SDLC transmission control in addition to the basic Binary Synchronous Communications (BSC) SDLC or BSC can be selected by the operator with a switch on the operator panel. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with Extended Function Base (#1068).

SECURITY KEYLOCK (#6340). A lock and key which prevents modification or display of data in the display terminal when in the off position. When the Security Keylock feature is combined with the Encrypt/Decrypt feature (#3680), a third position of the lock permits modification of the 56 bit Encrypt/Decrypt key variable. Maximum: One. Field Installation: Yes.

SECTOR LIGHT- PEN (#6350 for mdls 3, 4, 13 and 14; #6351 for mdls 1, 2, 11 and 12). A hand-held pen-like device which permits the operator to select fields of data from a display for input to the host system. The Sector Light-Pen, while not being used, can be placed in a designated position of the keyboard which is used for user’s incidental use. Selector Pen (and Cursor Select) operations have been expanded to include a new designator char­acter ‘B’. When this designator is used, modified opera­tion results in the return of both the addresses and the data of all modified fields on the screen. The #6351 Selector Light Pen has a slightly wider field of view to facilitate operator ease-of-use. Maximum: One. Field Installation: Yes.

TELECOMMUNICATION FEATURES

For TP attachment each 3276 must be equipped with one of the Communications Features (#6301 or #6302) and either the External Modem Interface (#3701) or DDS Adapter (#5650 for point-to-point operation, #5651 for multipoint operation) or one of the 1200 bps Integrated Modem features (#5500, #5501, #5502, #5507 or #5508). In addition, the SDLC/BSC Switch (#6315) may be selected on mdls 1, 2, 3 or 4 (see above). For loop attachment (3276 mdls 11, 12, 13 and 14 only) each 3276 must be equipped with the Communications Business Machine Clock (#6302) and the Loop Adapter (#4850).

EXTERNAL MODEM INTERFACE (#3701). Provides an EIA/CITT interface for attachment of an IBM or other external modem. Specify: #9490 for operation on the public switched network (mdls 11, 12, 13, 14), or #9491 for operation on private non-switched communication facilities. Maximum: One. Field Installation: Yes. Limitation: With #4850, #5500, #5501, #5502, #5507, #5508, #5650 or #5651. Prerequisite: Communication Feature With or Without Business Machine Clock (#6301 or #6503).

LOOP ADAPTER (#4850). [Mdl 11-14 only] Provides the capability to attach to either a direct or data link attached loop of the 8100 System. Maximum: One. Field Installation: Yes. Limitations: Cannot be ordered with #3701, #5500, #5501, #5502, #5507, #5508, #5650 or #5651. Prerequisite: Con-
1200 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides an integrated modem for operation over non-switched communications facilities at speeds of 1200/600 bps. No external modem is required. **Specify:** #9651 for use with 4-wire facility or #9652 for use with 2-wire facility. Maximum: One. Field Installation: Yes. Limitation: Cannot be ordered with #3701, #4850, #5501, #5502, #5507, #5508, #5650 or #5651. Prerequisite: Communications Feature with Business Machine Clock (#6301).

1200 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5501). (Models 11, 12, 13, 14 only) Provides an integrated modem with answer switched network capabilities for operation over switched communication facilities at speeds of 1200/600 bps. No external modem is required. **Specify:** Communication Feature with Business Machine Clock (#6301). Limitation: Cannot be ordered with #3701, #4850, #5501, #5502, #5507, or #5650 or #5651. Field Installation: Yes. Note: This feature requires a CBS type data access arrangement or FCC registered equivalent.

1200 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANSWER (#5502). (mdls 11, 12, 13, 14 only) Provides an integrated modem for communications with a remote CPU over the public switched telephone network at speeds of 1200/600 bps. No external modem is required. Maximum: One. Field Installation: Yes. Limitation: Cannot be ordered with #3701, #4850, #5501, #5502, or #5650 or #5651. Prerequisite: Communications Feature with Business Machine Clock (#6301). Note: This feature requires a data access arrangement type CDI, or FCC registered equivalent.

1200 BPS INTEGRATED MODEM, NON-SWITCHED WITH SWITCHED NETWORK BACKUP (#5507). Provides an integrated modem for operation over switched communications facilities, and also provides manual switched network backup capability. No external modem is required. **Specify:** #9651 for communication over 4-wire facility or #9652 for communication over 2-wire facility. Maximum: One. Field Installation: Yes. Limitation: Cannot be ordered with #3701, #4850, #5501, #5502, or #5650 or #5651. Prerequisite: Communications Feature with Business Machine Clock (#6301). Note: This feature requires a CBS type data access arrangement type CDI, or FCC registered equivalent, for switched network backup operation.

1200 BPS INTEGRATED MODEM, NON-SWITCHED WITH SWITCHED NETWORK BACKUP, AUTO ANSWER (#5508). Provides an integrated modem for operation over non-switched communication facilities at speed of 1200/600 bps and also provides auto/manual answer switched network backup capabilities. No external modem is required. **Specify:** #9651 for communications over 4-wire facility, or #9652 for communications over 2-wire facility. **Prerequisite:** Communications Feature with Business Machine Clock (#6301). Limitation: Cannot be ordered with #3701, #4850, #5501, #5502, or #5650 or #5651. Field Installation: Yes. Limitation: Cannot be ordered with #3701, #4850, #5501, #5502, or #5650 or #5651. Prerequisite: Communications Feature with Business Machine Clock (#6301). Maximum: One. #5650 or #5651. Prerequisite: Communications Feature without Business Machine Clock (#6302) with Specify Code #9822 for 2400 bps, or #9823 for 4800 bps, or #9825 for 9600 bps (mdls 11-14 only).

**DIGITAL DATA SERVICE (DDS) ADAPTER (#5650 for point-to-point operation, #5651 for multipoint operation).** An adapter for BSC or SDLC data transmission at a speed of 2400 bps, 4800 bps, or 9600 bps (mdls 11-14 only) over the AT&T non-switched Dataphone* digital data service network. The DDS Adapter interface to a DDS channel service unit, the customer site termination of the DDS network. Limitation: Cannot be installed with #3701, #4850, #5501, #5502, or #5007 or #5650 or #5651. Field Installation: Yes. See 3276 Specify [2] – Communication Cable. Maximum: One. #5650 or #5651. Prerequisite: Communications Feature without Business Machine Clock (#6302) with Specify Code #9822 for 2400 bps, or #9823 for 4800 bps, or #9825 for 9600 bps (mdls 11-14 only). COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCK (#6301). Required for attachment to communications facilities through any 1200 bps Integrated Modem, or the External Modem Interface (#3701) at 1200 bps. *Any extended modem that does not provide its own clocking. Maximum: One. Field Installation: Yes. Limitation: Cannot be ordered with #6302.

**COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6302).** Required for attachment to communications facilities, at speeds up to 9600 bps using BSC, through the External Modem Interface (#3701) and any external modem that provides its own clocking, through the DDS Adapter. It is also required for attachment to the 3276 mdls 11, 12, 13, and 14 to a direct or data link attached loop of the 8100 Snake at speeds of 9600 or 2400 bps respectively. **Specify:** #9821 for 2000 bps, #9822 for 2400 bps, or #9823 for 4800 bps, or #9824 for 7200 bps, or #9825 for 9600 bps. Maximum: One. Field Installation: Yes. Limitation: Cannot be ordered with #6302.

* Trademark of American Telephone & Telegraph Co. (AT&T).

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**MERCURY BATTERY (Part No. 1743456).** Provides power to sustain the master key of the Encrypt/Decrypt feature (#3680) when normal power is not present. This supply item is a 4.14 volt non-rechargeable mercury battery. This battery has a shelf life of 1 year under normal conditions, and can be expected to provide 3.5 years of normal operation. Note: Discharged battery should be returned to IBM. Field installation: Yes. Limitation: Can be installed on 3276 mdls 11, 12, 13 and 14 only. **Prerequisite:** Encrypt/Decrypt feature (#3680).

**MAGNETIC SLOT READER (#9441/Part No. 4123590).** A free standing Magnetic Slot Reader (MSR) that reads encoded information from a magnetic stripe. It attaches by a 1.5 meter cable thru the Magnetic Reader Controller (#4999). The MSR has 3 lights and a buzzer which provide feedback to the user on the status of the read data. The MSR accommodates a wide range (height and length) of magnetic striped plastic cards such as: ID badges, security operator identification cards, etc. Using the 2753/277 like 10-numeric character set, the maximum number of data characters that can be read are 7 to 37 characters at 75 bpi or 210 bpi, and 7 to 100 characters at 127 bpi. Not a minimum of seven characters must be encoded between the start sentinel and end sentinel characters.

The following cable assemblies can be used to extend the Magnetic Slot Reader distance. Limitation: Extension cables CANNOT be plugged into other extension cables.
Description:
19.7 feet (6 meters) -- #9106/Part No. 4832986
39.4 feet (12 meters) -- #9107/Part No. 4832987

A variety of magnetic documents, tags, and labels that the MSR can read, may be obtained from IRD, some of which, depending on length, can be encoded by devices such as the IBM 3642 Encoder Printer.

Note: Magnetic cards encoded with the Alternate End of Message character (hexidecimal "C") cannot be read by this reader. SSCP-LU communication for MSR is not supported when the MSR is attached to a 3276 or a 3278 which is attached to a 3276.

Limitation: Valid for numeric only data encoded according to the American National Standard entitled "Magnetic Strip Encoding for Credit Cards, ANSI x4.16 - 1973" when the MSR is attached to a 3276 or to a 3278 which is attached to a 3276. Prerequisite: Magnetic Reader Control (#4999).
IBM 3277 DISPLAY STATION

Purpose: A high-performance cathode-ray tube used in clusters with the 3271, 3272 or 3274 Control Unit for displaying alphanumeric characters and retrieving data from a S/360, S/370, 4300 Processor, 8100 Information System, and 3909 Communication System. A keyboard or light-pen can be used to enter characters and manipulate data on the screen in a highly flexible and efficient manner. With its comprehensive and powerful set of standard and optional features, the 3277 meets both general-purpose and unique display requirements.

NOTE: For possible use with System/3, see GSD Manual.

Model 1 For use with the 3271 mdl 1, 2, 11 or 12 or 3272 mdl 1 or 2 or 3274 mdl 1A, 1B, 1C or 1D. 3277 can be used on a 3277 display unit, to display up to 480 characters ... 12 lines of 40 characters each. For use with 3790 or 8100, see below.

Model 2 For use with the 3271 mdl 2 or 12 or 3272 mdl 2 or 3274 mdl 1A, 1B, 1C or 1D. To display up to 1920 characters ... 24 lines of 80 characters each. For use with 3790 or 8100, see below.

NOTE: 3277 mdl 1 and 2 displays may be intermixed on a 3271 mdl 1 or 12, 3272 mdl 2, or 3274 mdl 1A, 1B, 1C or 1D. In this configuration, each 3277 mdl 1 will display 480 characters supplied by the CPU to the 1,920 character buffer in the 3271, 3272 or 3274. 3277 mdl 1s and 2s may not be intermixed on a 3271 mdl 1 or 11, or 3272 mdl 1 or 3791. 3277 mdl 1 and 2 displays may be intermixed on the 8100 System via the 8100 Storage and Input/Output Unit.

Model Changes: Available at time of manufacture only.

Highlights: Displays sixty-three 7 x 9 dot-matrix characters ... 36 alphameric, 27 special characters, including the space. Features Data-Field Organization which permits individual fields of data on the screen to be program-defined with various attributes such as protected or unprotected, alphanumeric or numeric, normal intensity, non-displayed, or brightened intensity, and selector light-pen detection-allowed or disabled.

Editing Features — typematic, cursor, tab, back-tab, protected-deletes, insert and delete, and extended-erase (erase to end-of-field, erase all keyboard input data, erase entire screen) are standard features for displays equipped with a keyboard.

Input Flexibility — a choice of keyboards, a selector-light-pen, and a set of program function keys provide unmatched input flexibility ... “Special Features” below.

Output Flexibility — information on the screen can be directed to another display or hard copy device under program control.

Security Enhancement Features — a special Non-Display Keying Mode (standard) provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification of data on the display line if the key is turned to the “on” position. An Operator Identification Card Reader (optional) is provided to enter system user identification. This enhances the (programmed) control of his access to data and audit of his actions. It may also be used to enter any sequence of characters (pre-recorded on a card) for other purposes such as transaction control, account control, and billing.

For use with the 8100 Information System: For special features that are supported, see M 8101 pages. A 3271 or 3272 is not required when the 3277 mdl 1 or 2 is attached to the 8101 with #1505 or #1506. For character set, specify #9089. For power, see Specify [1] below. For cables, see M10000 pages for 8100 System. Host programs written for the 3270 are not supported by the 8100 System.

For use with 3790 Communication System: For special features that are supported, see 3791. A 3271, 3272 or 3274 is not required when the 3277 mdl 1 or 2 is attached to the 3791. For character set, specify #9089. For power, see Specify [1] below. For cables, see M10000 pages for 3790.

Maximum: Up to thirty-two 3277s can be attached to a 3271 or 3272. Up to sixteen 3277s can be attached to a 3274. The maximum is reduced by one on a 3271 or 3272 for each 3284 mdl 1, 2, 3286 mdl 1, 2, 3287, or 3288 Printer attached. The maximum is reduced by one on a 3274 for each 3284 mdl 1, 2, 3286 mdl 1, 2, 3287, or 3288 Printer attached through Terminal Adapters. If the 3284 or 3288 Attachment Card (set #7802 through #7805) is used with the 3274, up to 3277 mdls 1, 2, 3277, or 3288 attached to the 3790 System. For 3277s, the maximum is reduced by one for each 3284, 3286 or 3288 attached to the 8101. See M 8101 pages.

PREREQUISITES: For Model 1 — a 3271 mdl 1, 2, 11 or 12, a 3272 mdl 1 or 2, a 3274 mdl 1A, 1B, 1C or 1D with appropriate Device/ Terminal Adapters, or a 8101 with #1505 or #1506 ... see 3721, 3272, 3274 or 8101 pages.

For Model 2 — a 3271 mdl 2 or 12, a 3272 mdl 2, a 3274 with appropriate Device/Terminal Adapters, or a 8101 with #1505 or #1506 ... see 3271, 3272, 3274 or 8101 pages.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9860 for locking plug, #9861 for non-lock plug.


[3] Character Set: Specify one of the following unless Data Analysis-APL Feature (#1066) is selected.

- #289 — for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 ASCII characters but substitutes the Logical OR () and Logical NOT (~) for the exclamation mark (!) and circumflex (^). PREREQUISITE: If used with the 3271, ASCII Transmission Code (#9762 or #1200) is a prerequisite on the 3271.

- #9091 — for ASCII Character Set (A) (available at time of manufacture only) ... provides the standard ASCII characters. PREREQUISITE: If used with the 3271, ASCII Transmission Code (#9762 or #1200) is a prerequisite on the 3271.

[4] Console Use with System/3 mdl 15 (mdl 1 only). #9590 for System/3 mdl 15 console use only.

OPTIONS:

PRICEs: Mdl MAC/ MRC 2 year Warranty MLC 24.70 9.00 3,200 15.90

Plan Offering: Plan B Warranty: B Machine Group: A Purchase Option: 60% Useful Life Category: 2 Per Call: 1

Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 5%

SPECIAL FEATURES:

DATA ANALYSIS-APL FEATURE (#1066). [Mdl 2 only and attached to 3271, 3272] Provides dual case EBCDIC, the APL, the SELECTOR, and terminal TN (see Type Catalog, S/370 Printers) characters. 3274 TN characters are input and output both, 27 are output only. Field Installation: Yes.

AUDIBLE ALARM (#1060). An alarm, sounded under program control, to alert the operator to a special condition. This alarm during keyboard operation, is sounded when a character is entered into the next to last position on the screen. Maximum: One. Field Installation: Yes.

OPERATOR IDENTIFICATION CARD READER (#4690). Provides the capability of reading a 2 1/8 inch x 3 3/8 inch (53.9mm x 85.7mm) plastic data processing card with an encoded magnetic stripe. Using the 10-numeric character set and the characters that can read is 1-37 characters at 75 BPI (bits per inch).


KEYBOARD (#4630 thru #4639).

- #4630 — 66 key EBCDIC Typewriter Keyboard, typewriter-like layout, movable, with 45 alphameric keys and 21 control keys. PREREQUISITE: EBCDIC Character Set (#9089).

- #4631 — 66 key EBCDIC Data Entry Keyboard, movable, with 36 alphameric keys and 30 control keys. PREREQUISITE: EBCDIC Character Set (#9089).

- #4632 — 78 key Operator Console Keyboard, movable, with 45 alphameric keys and 21 control keys. PREREQUISITE: EBCDIC Character Set (#9089).

- #4633 — 78 key EBCDIC Typewriter Keyboard, 66 key EBCDIC typewriter layout, with 12 additional program function keys, movable. PREREQUISITE: EBCDIC Character Set (#9089).

- #4634 — 66 key ASCII Typewriter Keyboard, ASCII typewriter layout, movable, with 45 alphameric keys and 21 control keys. PREREQUISITE: ASCII Character Set (A) (#9091) or (B) (#9092).

- #4635 — 78 key EBCDIC Typewriter Keyboard, 66 key ASCII typewriter layout, movable, with 36 alphameric keys and 21 control keys. PREREQUISITE: ASCII Character Set (A) (#9091) or (B) (#9092).

- #4636 — 66 key EBCDIC Data Entry Keyboard, movable, with 36 alphameric keys and 21 control keys. PREREQUISITE: EBCDIC Character Set (#9089).

- #4637 — 66 key EBCDIC Typewriter Keyboard, movable, with 45 alphameric and 21 control keys. PREREQUISITE: EBCDIC/APL characters via special feature (#1066).

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3277 Display Station (cont'd)

#4638 - 78 key EBCDIC Typewriter/APL keyboard with 45 alphameric keys, 21 control keys, and 12 program keys. 
Prerequisite: EBCDIC/APL characters via special feature (#1066).

#4639 - 78 key EBCDIC Fast Cursor Text Keyboard, with 45 alphameric keys, 21 control keys, and 12 program keys. The speed of the Cursor and Typamatic key operation is approximately twice that of a non-Text keyboard. Includes Typamatic Delete and a function similar to typewriter carriage return. 
Prerequisite: Data Analysis - APL Feature (#1066) on 3277 mdl 2 as well as on a control unit (only 3271-2 or 12, or 3272-2).

Maximum: One. Field Installation: Yes.

KEYBOARD NUMERIC LOCK (#4690). Provides the ability to lock the keyboard if a non-numeric key [other than 0-9, minus (-), period (.), or dup] is depressed in a pre-defined numeric-only field. 
Maximum: One. Field Installation: Yes.

SECURITY KEYLOCK (#6340). A lock and key which prevents modification and display of data on the display when in the "off" position. Maximum: One. Field Installation: Yes.

SELECTOR LIGHT-PEN (#6350). A hand-held, pen-like device which permits the operator to select fields of data from a display for computer input. Maximum: One. Field Installation: Yes.

Special Feature Prices:

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Adequate cathode-ray tube (CRT), display station used in clusters with the 3274 Control Unit or the 3276 Control Unit Display Station. The purpose of this station is to display alphanumeric data, and for entering data into and receiving data from a S/360, S/370, 4300 Processor, a 3790 Communication System or a 8100 Information System. A Keyboard, Selector Light-pen or both permit an operator to display or to manipulate data in a flexible and efficient manner. With its set of basic and optional features, the 3276 meets both general purpose and unique display requirements.

NOTE: For use with the System/3, see GSD manual.

Model 1 For use with 3274 or 3276 to display up to 960 characters ... 12 lines of 80 characters each.

Model 2 For use with 3274 or 3276 or to attach to the 4331 Processor via the standard Display/Printer Adapter or optional Display/Printer Adapter Expansion. Displays up to 1920 characters ... 24 lines of 80 characters each.

Model 3 For use with 3274 or 3276 to display up to 2560 characters ... 32 lines of 80 characters each.

Model 4 For use with 3274 or 3276 to display up to 3440 characters ... 43 lines of 80 characters each.

Model 5 For use with 3274 models 1A, 1C or 1D to display up to 3564 characters ... 27 lines of 132 characters each.

For use with the 3790 Communication System: The 3791 Controller only supports the 3278 model 2. See the 3791 Configurator, GA27-2786-6, for additional information.

For use with the 8100 Information System: See the System Configuration, GA27-2876.

Highlights: Displays a character within a 7 x 14 character matrix in 960, 1920 and 2560 character models; within a 7 x 11 character matrix in the 3440 and 3564 character models. The basic 26 character upper letter presentation is shown in 7 x 9 character matrix for the 960, 1920 and 2560 character models, and in a 7 x 8 character matrix for the 3440 and 3564 character models. Displays a 94 character set: 26 upper case alphabetlic, 10 numeric and 32 special characters. A monochrome switch provides the capability of rapidly switching between upper case alphanumeric mode for 3277 compatibility. Uses 3270 field formatting capability which permits individual fields of data on the screen to be programmed in various attributes such as protected/unprotected, alaphabetic, normal/highlighted intensity, displayable/non-displayable, and selector light-pen detection allowed/disallowed.

The operator may initiate a local display-to-printer copy function (i.e., without host intervention) from the keyboard of a 3278. When the 3278 is attached to a 3274 Control Unit, the printer designation is controlled by operator use of the IDENT key and (a) by a printer authorization matrix which is loaded into the 3274 Control Unit through a user written host application program or, (b) by a customer definable matrix loaded from the system diskette at the time of installation. For further details see the IBM 3270 Information System Planning and Setup Guide, GA27-2827. When the 3278 is attached to a 3276 Control Unit Display Station, the printer designation is controlled by the operator use of the IDENT key and the configuration default matrix. This matrix is determined by the relative positions of devices attached to the 3276. (The host can perform a copy in a manner compatible with existing 3271/3272 support.)

Operator Functions -- the 3278 has a anti-glare screen. Indicators are displayed on the bottom row of the screen, outside the data display area, and provide useful operator information. Host display of data on the screen is accomplished without refresh interrupt (i.e., no blinking). The keyboard, which is low in profile, provides a palm rest area and has separators to help prevent accidental striking of control keys. The operator may select one of several cursor modes.

Editing Functions -- Cursor move, tab, home key, back tab, insert, delete, extended erase (erase to end of field, erase all keyboard input data, and erase entire screen), and cursor select keys are all basic for displays equipped with a keyboard. All alphanemic, special symbol, and cursor move keys have typemic capability. Double speed cursor typemic is attainable only while simultaneous depressing of the ALT key and a horizontal cursor positioning key. The cursor select function provides an alternative to the Selector Light-pen function. Fields of data may be selected by positioning the cursor and then using the Cursor Select Key.

Input Flexibility -- a choice of keyboards or the selector light-pen provides input flexibility. A Magnetic Slot Reader (optional) and for 3278's attached to a 3274 Control Unit, a Magnetic Hand Scanner (optional) are available. For use with a unit only as a magnetic encoder... see "Special Features" below. Fields of data can be selected by positioning the cursor and operating the cursor select key, instead of using the Selector Light-pen and Program Function (P.F.) keys are basic with all typewriter keyboards.

Security Functions -- a special non-displayed input mode provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A similar function (optional) prevents modification or display of data in the display terminal unless the key is turned to the "on" position. These capabilities and the terminal's ability to identify itself to the host allow the customer supplied security program routines to control access to data and audit of actions. A Magnetic Slot Reader (optional) and, for 3278's attached to a 3274 Control Unit, a Magnetic Hand Scanner (optional) are available to enter system user identification.

When attached to the 4331 Processor via the standard Display/Printer Adapter or optional Display/Printer Adapter Expansion, functional support varies from that of the 3278-2 attached to a 3274 or 3276. See M 3431 pages for details of support.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater accessibility to the customer. This increased availability has been achieved through the use of problem determination and recovery procedures that are easily understood and used by the operator. The procedures are provided by the Problem Determination Guide manual that will be stored under the keyboard palm rest. Also, see "Customer Responsibilities" below.

Customer Set-Up (CSU): The 3278 is designated Customer Set-Up thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:
- Adequate site, system and other vendor preparation.
- Receipt at the customer's receiving dock, unpacking and placement of the 3278.
- Physical set-up, connection of cables in protected customer access areas, switch settings, and checkout.
- Contact Field Engineering to obtain field interconnection of IBM CSU units to non-CSU units where customer access areas are not provided.
- Notify IBM of intent to relocate and follow IBM instructions for proper interconnection.
- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removal to the customer's shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.

PREREQUISITES: The 3278 requires a 3274 or 3276 with appropriate Terminal Adapter. 3278 model 3 requires Configuration Support B (P#311) on the 3790 to which it is attached. See 3274 or 3276 Machines pages. When attached to the 3790 Communication System or the 8100 System via the 3276 Control Unit, all 3278 display units must have a keyboard.

Bibliography: See KWIC Index, G320-1621 or specific system bibliography.

SPECIFY: [1] Voltage (120 V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug. If standard 2.8 meter (9 foot) power cable is not desired, specify #9811 for 1.6 meter (6 foot) cable, #9512 for 3.7 meter (12 foot) cable, or #9513 for 4.5 meter (15 foot) cable.


[3] Character Set: For record purposes, specify one:
- #9082 -- for EBCDIC Character Set -- used in conjunction with 75 Key Typewriter Keyboard (#4821), Data Entry Keyboard (#4622 or #4623), IBM EBCDIC Typewriter Keyboard (#4627), Typewriter/APL Keyboard (#4626) or Typewriter/Text Keyboard (#4629).
- #9084 -- for ASCII Character Set (B) -- used in conjunction with 75 Key ASCII Typewriter Keyboard (#4624) or 87 Key ASCII Typewriter Keyboard (#4628).

[4] System Attachment: identify the 3274 or 3276 model this 3278 attaches to.

3274 or 3276 | Code
--- | ---
3274 mdl 1A | #9549
3274 mdl 1B | #9550
3274 mdl 1C | #9561
3274 mdl 1D | #9261
3276 mdl 1 | 2, 3, 4 | #9552
3276 mdl 11, 12, 13, 14 | #9553

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### SPECIAL FEATURES

**NOTE:** Not all of the following special features are supported by 3278-2s attached to the 4331 system via the standard Display/Printer Adapter or the Display/Printer Adapter Expansion. See 4331 pages for a list of supported adapters.

#### AUDIBLE ALARM (#1090)

An alarm, sounded under program control, to alert the operator to a special condition. This alarm, during keyboard operation, is also sounded when a character is entered in the next blank position on the screen. The operator may adjust the volume of the tone. **Maximum:** One. **Field Installation:** Yes.

**APL/TEXT (#1120).** Provides the capability for display of 222-character APL/Text Character set including the 94-character EBCDIC set. **Maximum:** One. **Field Installation:** Yes. **Corequisite:** 87-key EBCDIC Typewriter/APL Keyboard (#4626) or 87-key EBCDIC Typewriter/Text Keyboard (#4629). **Limitations:** This feature is only valid on a 3278 Display Station attached to a 3276 with APL/Text Control feature (#1067) or to a 3274 md1 1A, 1C or 1D customized to include the APL/Text Control Function. This feature is EBCDIC only and is not compatible with ASCII **Prerequisites:** Extended Character Set Adapter (#3610) and EBCDIC Character Set Specify (#9082).

#### SWITCH CONTROL UNIT (#1720)

This feature, when installed on a 3278 Display Station, permits switching operational control of that display between two different control units. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** Yes.

#### EXTENDED CHARACTER SET ADAPTER (#3610)

Provides the additional control and buffering necessary for the extended character set in the APL/Text (#1120) feature. **Maximum:** One. **Field Installation:** Yes. **Corequisite:** APL/Text (#1120).

#### KEYBOARD

**#4621 — 75 Key Typewriter Keyboard ... typewriter-like layout,** movable, with 49 data keys and 26 control keys. Twelve program function keys are included in the top row of data keys through use of an alternate shift key. **Prerequisite:** EBCDIC Character Set (#9082).

**#4622 — 75 Key Data Entry Keyboard ... keypunch layout,** movable, with 35 data keys, 10 program function keys and 30 control keys. **Prerequisite:** EBCDIC Character Set (#9082).

**#4623 — 75 Key Data Entry Keyboard ... keypunch layout,** movable, with 35 data keys, 10 program function keys and 30 control keys. This is the recommended keyboard for data entry. **Prerequisite:** EBCDIC Character Set (#9082).

**#4624 — 75 Key ASCII Typewriter Keyboard ... ASCII typewriter layout,** movable, with 49 data keys and 26 control keys. Twelve program function keys are included in the top row of the data keys through use of an alternate shift key. **Prerequisite:** ASCII Character Set (B) (#9084).

**#4626 — 87 Key EBCDIC Typewriter/Text Keyboard ... an 87-key EBCDIC typewriter keyboard (ref. #4627) with modified keytops to row entry of 81 APL specific characters in addition to the 94-character EBCDIC set. An APL On/Off key controls whether the keyboard is in basic EBCDIC typewriter or APL. In contrast to the 87-key EBCDIC typewriter keyboard without APL (ref. #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are the group of twelve keys to the right of the main keyboard area. **Prerequisites:** APL/Text (#1120) and EBCDIC Character Set (#9082).

**#4627 — 87 Key EBCDIC Typewriter Keyboard ... typewriter-like layout,** movable, with 49 alphabetic data keys, 26 control keys, and 12 program function keys (24 total P.F. keys). Twelve of the program function keys are included in the top row of data keys through use of an alternate shift key. **Prerequisite:** EBCDIC Character Set (#9082).

**#4628 — 87 Key ASCII Typewriter Keyboard ... ASCII typewriter-like layout,** movable, with 49 alphabetic data keys, 26 control keys, and 12 program function keys (24 total P.F. keys). Twelve of the program function keys are included in the top row of data keys and are available through the use of an alternate shift key. **Prerequisite:** ASCII Character Set (#9084).

**#4629 — 87 Key EBCDIC Typewriter/Text Keyboard ... an 87-key EBCDIC typewriter keyboard (ref. #4627) with modified keytops to allow entry of 65 Text specific characters in addition to the 94-character EBCDIC set. A Text On/Off key controls whether the keyboard is in EBCDIC typewriter or Text mode. In contrast to an 87-key EBCDIC typewriter keyboard without Text (ref. #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are the group of twelve keys to the right of the main keyboard area. **Prerequisites:** APL/Text (#1120) and EBCDIC Character Set (#9082).

**Maximum:** One of the above. **Field Installation:** Yes. The keyboard is set up by the customer. Limitation: Keyboards used on the 3275/3277 machines are not interchangeable with keyboards used on 3276/3278 machines. Only two of the three keyboard types (Typewriter, Data Entry, or Data Entry-Keypunch) can be supported at any one time on displays attached to a 3274 Control Unit. Text and APL keyboards are not affected by this limitation and can be installed with any of the other keyboards without restriction. **Specify:** If standard 0.9 meter (3 foot) keyboard cable is desired, specify #3999 for 0.8 meter (2.5 foot) cable.

**KEYBOARD NUMERIC LOCK (#4690).** Provides any keyboard with the capability to lock the keyboard if a non-numeric key [other than 0-9, minus (-), decimal sign, or dup] is operated in a predefined numeric-only field. **Maximum:** One. **Field Installation:** Yes.

**MAGNETIC READER CONTROL (#4999).** Provides the capability of attaching a Magnetic Hand Scanner (MHS) or Magnetic Slot Reader (MSR) which reads encoded information from a magnetic stripe. The MSR can be used when the 3278 is connected to either a 3274 or 3276, but the MHS can only be used when the 3278 is connected to a 3274 Control Unit. **Maximum:** One. **Field Installation:** Yes.

**SECURITY KEYLOCK (#6340).** A lock and key which prevents modification or display of data in the display terminal when in the "off" position. **Maximum:** One. **Field Installation:** Yes.

**SELECTOR LIGHT-PEN (#6350) for mdls 3, 4 and 5: #6351 for mdls 1 and 2.** A hand-held, pen-like device which permits the operator to select fields of data from a display for input to the host system. The Selector Light-Pen, while not being used, can be placed in a recess of the keyboard, which is used for user's incidental items. Selector Pen (and Cursor Select) operations have been expanded to include a new designator character "S". When this designator is used the Read Modified operation returns both the addresses and the data of all modified fields on the screen. The 36351 Selector Light Pen has a single wider panel of view to facilitate operator ease-of-use. **Maximum:** One. **Field Installation:** Yes.

#### Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC 2 yr</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audible Alarm</td>
<td>$1090</td>
<td>$2</td>
<td>$2</td>
</tr>
<tr>
<td>APL/Text</td>
<td>1120</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Switch Control Unit</td>
<td>1720</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>Extended Char Set Adptr</td>
<td>3610</td>
<td>11</td>
<td>405</td>
</tr>
<tr>
<td>Keyboard</td>
<td>4621</td>
<td>13</td>
<td>495</td>
</tr>
<tr>
<td>Keyboard</td>
<td>4622</td>
<td>13</td>
<td>495</td>
</tr>
<tr>
<td>Keyboard</td>
<td>4623</td>
<td>13</td>
<td>495</td>
</tr>
<tr>
<td>Keyboard</td>
<td>4624</td>
<td>13</td>
<td>495</td>
</tr>
<tr>
<td>Keyboard</td>
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<tr>
<td>Keyboard</td>
<td>4629</td>
<td>13</td>
<td>495</td>
</tr>
<tr>
<td>Desktop Reader Control</td>
<td>4990</td>
<td>12</td>
<td>1675</td>
</tr>
<tr>
<td>Security Keylock</td>
<td>6340</td>
<td>35 SUC</td>
<td>35</td>
</tr>
<tr>
<td>Selector Light-Pen</td>
<td>5350</td>
<td>13</td>
<td>585</td>
</tr>
<tr>
<td>Selector Light Pen</td>
<td>6351</td>
<td>13</td>
<td>585</td>
</tr>
</tbody>
</table>

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ACCESORIES: The following items are available on a purchase only basis. For shipment with machines, order the Feature Numbers shown below at the price listed in the M10000 pages. See M10000 pages for additional information and for ordering for field installation.

<table>
<thead>
<tr>
<th>Item</th>
<th>Feature Number</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnetic Hand Scanner</td>
<td>#9440</td>
<td></td>
</tr>
<tr>
<td>Magnetic Slot Reader</td>
<td>#9441</td>
<td></td>
</tr>
<tr>
<td>Magnetic Reader Extension Cable ... for use with Magnetic Hand Scanner or Magnetic Slot Reader</td>
<td>#9106</td>
<td>**</td>
</tr>
<tr>
<td>19.7 ft. (6 meter)</td>
<td></td>
<td>**</td>
</tr>
<tr>
<td>39.4 ft. (12 meter)</td>
<td></td>
<td>**</td>
</tr>
</tbody>
</table>

* A maximum of one magnetic reader or scanner may be ordered.

** A maximum of one extension cable may be ordered.

MAGNETIC HAND SCANNER ([#9440/Part No. 4123495]): The Magnetic Hand Scanner (MHS) attaches by a 1.5 meter (4.9 ft) coiled cable to a number of data entry and reporting devices that have an appropriate magnetic adapter feature. It allows the user to read magnetic stripe labels that are attached to shelves, cartons, machines, etc. It can also be used to read magnetic stripe tags which are hand-held or placed on a flat surface.

The MHS has three lights and an audible buzzer which provide feedback to the user on the status of the scanned data. It can read a stripe in either direction. Field Installation: Yes. Prerequisite: Magnetic Reader Control (#4999). See Note 1.

MAGNETIC SLOT READER ([#9441/Part No. 4123500]): The Magnetic Slot Reader (MSR) attaches by a 1.5 meter (4.9 ft) cable to a number of data entry and reporting devices that have an appropriate magnetic adapter feature. The slot reader accommodates a wide range (height and length) of magnetic striped card stock and plastic badges including: job tickets, magnetic striped 80 column cards, operator identification badges, large and small credit cards, etc.

The MSR has three lights and an audible buzzer which provide feedback to the user on the status of scanned data. Holes in the bottom of the MSR allow optional attachment to an appropriate flat surface. Field Installation: Yes. Prerequisite: Magnetic Reader Control (#4999). See Note 1.

NOTE 1

The following cable assemblies can be used to extend the Magnetic Hand Scanner and Magnetic Slot Reader distances. Limitations: Extension cables cannot be plugged into other extension cables.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.7 ft. (6 meter)</td>
<td>#9106/Part No. 4832986</td>
</tr>
<tr>
<td>39.4 ft. (12 meter)</td>
<td>#9107/Part No. 4832987</td>
</tr>
</tbody>
</table>

Both the MHS and the MSR read magnetically encoded information from a 10/63 alphanumeric character set; the MSR also reads the same 10 character numeric only set as the 3277 Operator Identification Card Reader (#4800) which is not a subset of the 10/63 alphanumeric character set. For a further description of both character sets see IBM 3270 Information Display System Character Set Reference GA27-2837. Either (not both) the 10/63 alphanumeric or the 10 numeric only 3277 like character set may be selected for the 3274 Control Unit at customization time. The 3276 Control Unit Display Station and attached 3270s support only the MSR and the 10 character numeric only set as used by the 3277.

### Numeric and Alphanumeric Character Set Capacities

<table>
<thead>
<tr>
<th>MSR/MHS</th>
<th>Minimum Number of Hex Codes Between Start Sentinel and End Sentinel Characters</th>
<th>Maximum Number of Characters Between Start Sentinel and End Sentinel Characters</th>
<th>Bits Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>3277</td>
<td>7</td>
<td>37</td>
<td>75</td>
</tr>
<tr>
<td>10-Numeric Character Set</td>
<td>7</td>
<td>100</td>
<td>127</td>
</tr>
<tr>
<td>Alphanumeric Character Set</td>
<td>7</td>
<td>37 numerics</td>
<td>75</td>
</tr>
<tr>
<td>Character Set*</td>
<td>7</td>
<td>18 non-numerics</td>
<td>75</td>
</tr>
<tr>
<td>Set**</td>
<td>7</td>
<td>100 numerics</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>50 non-numerics</td>
<td>127</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>37 numerics</td>
<td>**210</td>
</tr>
</tbody>
</table>

* 1 Hex code = 1 numeric character, 2 Hex codes = 1 non-numeric character
** MSR only.

Note: Full width encoding is recommended for the MSR and is required for the MHS.
Purpose: A cathode-ray tube (CRT) display console which attaches to 4331 and 4341 Processors and provides for operator interaction for both normal operations and maintenance. An operator console keyboard with an operator control panel on the primary 3278 mdl 2A is the means to Power On (4341 only), Power Off, Initial Microcode Load (IML), and Start or Stop processor operations. See feature #4631 or #4632 for the 4341, or #4634 for the 4331 in "Special Features" below.

Highlights: Displays characters in a 7 x 14 matrix (upper case alphabet is displayed in a 7 x 9 matrix), arranged in 24 rows of 80 characters each. Rows 1 through 20 are usable by the operator, rows 21 through 24 are used for system status information. A 96-character set is used, consisting of 26 upper case alphabetic, 26 lower case alphabetic, 10 numeric and 32 special characters, plus space and null.

In addition to Power On (4341 only), Power Off, IML and Start/Stop, the console allows the operator to manually control such functions as storage display and operation, address comparing, and normal versus instruction step processing. The console indicates to the operator both proper operations and malfunctions, should they occur.

For maintenance and service support the console can display and store the status of the processor complex and other valuable servicing information. It also provides a means for using diagnostic tools.

The 3278 model 2A that is used as the primary console is normally installed concurrently with the installation of the 4331 or 4341 Processor.

Operator Factors: The 3278 has an anti-glare screen. Indicators are displayed in symbols and/or words outside of the data area. The keyboard, which is low in profile, provides a palm rest area and has separators to help prevent accidental striking of control keys.

Editing: Cursor move, tab, home, back tab, insert, delete, erase to end-of-field and erase all input keys are basic to the console keyboard. Alphabetic, special symbol and cursor move keys have typamatic capability. Twelve (12) Program Function (PF) keys are basic.

Audible Alarm: An alarm is sounded under program control to alert the operator to a special condition. The alarm, during normal versus instruction step processing. The console also provides a means for using the "Alternate" shift key. Provides 49 data keys and 26 control keys, and contains an operator control panel with 4 control keys (Power Off, Lamp Test, Power On/IML, Channel to Channel) and 6 LED indicators (Basic Check, System, Wait, Power in Process, Power Complete, Channel to Channel Disabled). Note: Channel to Channel is required for a 4341 Processor equipped with a Channel-to-channel Adapter (#1850). Maximum: One. Limitation: Cannot be installed with #4632 or #4633. Field Installation: Available at time of manufacture only.

75-Key OPERATOR CONSOLE KEYBOARD WITHOUT CHANNEL TO CHANNEL (#4632). [For use with 4341 only] Same as #4631 but the operator control panel does not have the Channel to Channel control key or the Channel to Channel Disabled Indicator. Maximum: One. Limitation: Cannot be installed with #4631 or #4633. Field Installation: Available at time of manufacture only.

SPECIAL FEATURES

KEYBOARDS

Cabling: Cables from the Display Console to the Processor will be furnished by IBM for keyboards #4631, 4632 and 4634. The fixed cable length provided for these features is 25 feet (7.6 meters). The cables must be ordered via normal procedures. For keyboard #4633 the cables must be supplied by the customer as outlined for the 3278 model 2 in the IBM Information Display System Installation Manual - Physical Planning, GA27-2767. The maximum cable length for this feature is 4933 feet (1500 meters).

Limitations: Keyboards used on the 3278 mdl 2A are not interchangeable with keyboards used on 3278 mdls 1 thru 4, nor with keyboards used on 3277 mdls 1, 2. A maximum of Same as #4631 but the operator control panel does not have the Channel to Channel control key or the Channel to Channel Disabled Indicator. Field Installation: Available at time of manufacture only.

75-YEAR OPERATOR CONSOLE KEYBOARD WITHOUT CHANNEL TO CHANNEL (#4632). [For use with 4341 only] Same as #4631 but the operator control panel does not have the Channel to Channel control key or the Channel to Channel Disabled Indicator. Maximum: One. Limitation: Cannot be installed with #4631 or #4633. Field Installation: Available at time of manufacture only.

75-YEAR OPERATOR CONSOLE KEYBOARD (#4633). [For use with 4341 only] Same as #4631 but with no operator control panel. Maximum: One. Limitation: Cannot be installed with #4631 or #4632. Field Installation: Available at time of manufacture only.

SECURITY KEYLOCK (#3240). A lock and key which prevents modification or display of data in the display terminal when in the "Off" position. Maximum: One. Field Installation: Yes.

SPECIAL FEATURE PRICES:

MLC

5-Year Key Operator Console

Cost

$16

$14

$550

$6.00

75-Key Operator Console

Keyboard (4341)

w Chan-to-Chan (4341)

w/o Chan-to-Chan (4331)

Security Keylock

SPECIAL FEATURES

ACCESSORIES: A Console Table (#1550) is available ... see "Accessories" under 4331 or 4341 for ordering instructions and price.

MLC

729 A

$79

$67

$2,680

$21.50

Plan Offering: Plan B Machine Group: D Per Call: 3 Purchase Option: 55% Warranty: B Useful Life Category: 2 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 5%

Model Changes: Not recommended for field installation.

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IBM 3284 Printer

**Purpose:** Provides hardcopy output at a speed of 40 cps.

**NOTE:** For possible use with System/3, see GSO Manual.

**Model 1**
- Provides storage of 480 characters and attaches to a 3271 Control Unit mdl 1, 2, 11 or 12, or a 3272 Control Unit mdl 1 or 2, or a 3274 Control Unit mdl 1A, 1B, 1C or 1D, or a 8101 on a 8100 System. For use with 3790 or 8100, see below.

**Model 2**
- Provides storage of 1,920 characters and attaches to either a 3271 Control Unit mdl 2 or 12, or a 3272 Control Unit mdl 2, or a 3274 mdl 1A, 1B, 1C or 1D, or a 8101 on a 8100 System. For use with 3790 or 8100, see below.

**Model 3**
- Attaches to and uses the storage buffer of a 3275 Display Station mdl 2, 3 or 12.

**Highlights:** Provides a hardcopy output at a speed of 40 cps, using the EBCDIC character set ... for ASCII character sets, see "Specify" below. Model 1 and 2 may print from the Processor or the contents of a 3277 Display Station, 3284, 3286 or 3287 Printer buffer via the 3271, 3272 or 3274 Control Unit. When used with the 8100 System, the 3284 prints under control of the operating system. Model 3 prints the contents of the buffers of the 3275 Display Station or the 5275 Direct Numerical Control Station. The unit has a pin feed platen which permits the feeding of marginally punched continuous forms paper. 120, 126 or 132 print positions may be specified ... see "Specify," Line spacing is 6 lines/inch. Matrix characters are formed by 7 vertical wires printing dots in up to 4 of 7 possible horizontal positions (see Note below). Use of the underscore in conjunction with another character will overprint the lowest dot in that character and is not recommended. Refer to SRL GA24-3488 for forms design considerations and limitations. Up to 6-part forms can be printed with a maximum thickness of .015" (for optimum feeding and stacking, no more than 3 parts are recommended). Forms lengths can be 3" to 14" in increments of 1/8". Card stock continuous forms are not recommended. Note: With special feature #1066 matrix characters are formed using 8 vertical wires.

For use with 3790 Communication System: A 3271 or 3272 is not required when the 3284 is attached to the 3791. For additional information see the 3791 Configurator GA27-2788-6. For power, see Specify [1] below; for cable, see M10000 for 3790. Host programs written for the IBM 3270 are not supported by the 3790 System.

For use with the 8100 Information System: For special features that are not supported, see M 8101 pages. A 3271 or 3272 is not required when the 3284 mdl 1 or 2 is attached to the 8101 with #1505 or #1506. For character set, specify #9809. For power, see Specify [1] below. For cables, see M10000 pages for 8100 System. Host programs written for the 3270 are not supported by the 8100 System.

**PREREQUISITES:**
- **Model 1** -- a 3271 mdl 1, 2, 11 or 12, or a 3272 mdl 1 or 2, or a 3274 mdl 1A, 1B, 1C or 1D with appropriate Device/Terminal Adapter, or a 8101 with #1505 or #1506 (see 8101 pages)
- **Model 2** -- a 3271 mdl 2 or 12, or a 3272 mdl 2, or a 3274 mdl 1A, 1B, 1C or 1D with appropriate Device/Terminal Adapter, or a 8101 with #1505 or #1506 (see 8101 pages)
- **Model 3** -- a 3275 mdl 2, 3 or 12 with Printer Adapter (#5550) or a 5275 with Printer Adapter (#5555)

**Supplies:** A black ribbon, IBM Part No. 1136970 or equivalent, is required.

**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.

**SPECIFY:**
- [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.
- [2] Pin Feed Platen: #9162 for 126 print positions (13-1/8" hole-to-hole), or #9167 for 120 print positions (12-1/2" hole-to-hole), or #9168 for 132 print positions (13-7/8" hole-to-hole). NOTE: Do not order #9167 or #9168 unless paper is available in your area.
- [3] Character Set: Specify one of the following unless Data Analysis-APL Feature (#1066) is selected;
  - #9069 -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard. #9069 required if used with the 3275 mdl 3. **PREREQUISITE:** If used with the 3271 mdl 1 or 2, EBCDIC Transmission Code (#9761) is required on the 3271 mdl 1 or 2.
  - #9089 -- for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but sub-

---

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IBM 3286 PRINTER

Purpose: Provides hard copy output at a speed of 66 cps.

NOTE: For possible use with S/3, see GSD manual.

Model 1 provides storage of 480 characters and attaches to either a 3271 Control Unit mdl 1, 2, 11 or 12, or a 3272 Control Unit mdl 1 or 2, or a 3274 mdl 1A, 1B, 1C or 1D, or a 8101 on a 8100 System. For use with 3790 or 8100, see below.

Model 2 provides storage of 1,920 characters and attaches to either a 3271 Control Unit mdl 2 or 12, a 3272 Control Unit mdl 2, a 3274 Control Unit mdl 1A, 1B, 1C or 1D, a 8101 on a 8100 System, or S/370 mdl 138 and 148 as a hard copy console printer via their standard Integrated Console Printer Adapter. For use with 3790 or 8100, see below.

Model 3 attaches to and uses the storage buffer of a 3735 Programmable Buffered Terminal mdl 1.

Highlights: Provides controls, storage and hard copy output at a speed of 66 cps, using the EBCDIC character set. Matrix characters are formed using 8 vertical wires, in increments of .018". Forms are not supported by the 3286. See 8101 or 8100 System:

PREREQUISITE: For use with the 3271, S/370 mdl 138 or 148 via their standard Integrated Console Printer Adapter. For use with the 3271, S/370 Transmission Code (#9762 or #1200) is required on the 3271. If used with the 3735, S/370 Transmission Code (#9762) is required on the 3735.

Character Set: When attaching to a S/370 mdl 138 or 148 via the standard Integrated Console Printer Adapter:

- #9099 only -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard.
- #9091 -- for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but substitutes the logical OR (I) and logical NOT (-) in place of the EXCLAMATION MARK (!) and CIRCUMFLEX (^). PREREQUISITE: If used with the 3271, ASCII Transmission Code (#9762 or #1200) is required on the 3271.
- #922 -- for ASCII Character Set (B) (available at time of manufacture only) ... provides the standard 64 ASCII characters. PREREQUISITES: If used with the 3271, ASCII Transmission Code (#9762 or #1200) is required on the 3271.

Character Set when attaching to a S/370 mdl 138 or 148 via the standard Integrated Console Printer Adapter:

- #9099 only -- for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard.

Cables unless attaching to the S/370 mdl 138 or 148 via the standard Console Printer Adapter: See M 10000 pages for 3286 cable prices and ordering instructions. For cable specifications, see 3270 Installation Manual - Physical Planning, GA22-2787.

Cables when attaching to the S/370 mdl 138 or 148 via the standard Integrated Console Printer Adapter: Cable order required. For ordering information, see Installation Manual - Physical Planning, GA22-7004.

SPECIAL FEATURES

DATA ANALYSIS-APL FEATURE (#1066).

Special Feature Prices:

<table>
<thead>
<tr>
<th>MAC/ MLC</th>
<th>MRC</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>3286 1</td>
<td>$169</td>
<td>$144</td>
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<tr>
<td>126</td>
<td>$81</td>
<td>$50</td>
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<tr>
<td>12</td>
<td>$195</td>
<td>$172</td>
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<td>150</td>
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<td>152</td>
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<td>$27</td>
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<tr>
<td>156</td>
<td>$12</td>
<td>$10</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B Warranty: B Machine Group: A Purchase Option: 60% Useful Life Category: 2 Per Call: 1 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 5% Model Changes: Model changes between model 1 and model 2 are field installable. model 3 is not interchangeable with model 1 or model 2.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

3286 model 1 to model 2...$736

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the feature indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450) -- Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

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Purpose: Provides hard copy output. The 3287 mdls 1 and 2 attach to a 3271 Control Unit mdl 1, 2, 11 or 12, a 3272 Control Unit mdl 1 or 2, a 3274 Control Unit Display Station mdl 1A, 1B, 1C or 1D, a 3276 Control Unit Display Station mdl 1, 2, 3, 4, 11, 12, 13, 14, a 3791 Controller, or to the 8101 Storage and Input/Output Unit of the 8100 Information System. The 3287 mdl 1 or 2 also attaches, via the Integrated Console Printer Adapter, to a S/370 mdl 138 or 148 as a console printer. The 3271 mdl 1 or 2 also attaches to the 4331 Processor via the Display/Printer Adapter, or directly to a 4341 Processor.

Model 1 80 cps maximum bi-directional printer.
Model 2 120 cps maximum bi-directional printer.

NOTE: Actual printer throughput is dependent upon operational and system characteristics. Factors such as controller configuration and line transmission speed, output format, and programming application processing must all be considered in determining actual throughput.

Highlights: The 3287 consists of control functions, printer and indicator lights in one integrally designed desk-top unit. Special features are available which permit tailoring of the printer to the user’s requirements.

Where the 3287 replaces a 3284 or 3286 Printer the Variable Width Forms Tractor (special feature) is used in lieu of the Pin Feed Plate in Forms Tractor RPO. In addition, Friction Feed Paper Handling is available as a special feature.

Control Functions: Provides the control for all online operations. This unit requires the 3271/3272 Attachment (#8330) for receiving data from a 3271/3272 Control Unit, a 3274 Control Unit (Terminal Adapter Type B), a 3790 Communication System through the 8101 Storage and Input/Output Unit of the 8100 System, a S/370 mdl 138/148 (Integrated Console Printer Adapter) or the 3274/3276 Attachment Feature (#8331) for receiving data from a 3274 Control Unit (Terminal Adapter Type A) or a 3276 Control Unit Display Station, a 4331 Processor Display/Printer Adapter or a 4341 Processor.

Printer: Maximum printer throughput is obtained with bi-directional serial matrix printing and indexing without unnecessary print head movement. The printer dot matrix is 4 of 7 wide by 8 high giving legibility with character spacing at 10 to the inch. Line spacing is 6 and 8 lines to the inch. Up to 132 characters can be printed in a line. Up to 6 part forms (total thickness – 0.457mm/.018") may be used. For any multi-part or pre-printed continuous forms the Variable Width Forms Tractor (#8700) is recommended. Five and six part continuous forms should be tried to the inch. Up to 1 32 characters can be printed in a line. Up to 6 part forms (total thickness – 378mm/14-7/8"; card stock forms are not recommended.

Customer Responsibilities: The customer is responsible for:
- Adequate site, system and other vendor preparation.
- Receipt at the customer’s receiving dock, unpacking, and placement of the 3287.
- Physical set-up, connection of cables, switch settings, and checkout.
- Contact Field Engineering to make cable connections of IBM CSU units to IBM non CSU units where customer access areas are not provided.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.

Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.

Disconnecting, packing and removal to the customer shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.

- Providing a desk or table top to support the 3287.

PREREQUISITES:

Attachment
3271/3272
3274
#8330
#8330/#8331

Device Adapter on
Control Unit
Type A or B Adapter
(see M 3274 pages)

3276
#8331
Available port or added #3255, #3256, #3257

1031
#8330
Available port or #7911 or #7912 or added #7912.

S/370 mdl 138/148 #8330 #9425

1010
Available port on #1505 or #1506

Forms Handling: Variable Width Forms Tractor (#8700) or Friction Feed Paper Handling (#4110) must be ordered for each 3287 mdl 1 or 2.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Supplies: A black ribbon, IBM Part No. 1136653 or equivalent, is required.

Specify Features (For details, see Specify Descriptions): (AA) (BB) (CC) (DD) (EE) (FF) (GG)

- Locking Plug #8890 X X X X X X X
- Non-lock Plug 9891 X X X X X X X
- Power Cord 1.8m (6 foot) 9511 X X X X X X X
- 2.6m (9 foot) default X X X X X X X
- 3.7m (12 foot) 9512 X X X X X X X
- 4.5m (15 foot) 9513 X X X X X X X
- Cables... see Specify below X X X X X X X
- Character Set (Note a) EBCDIC 9082 X X X X X X X
- ASCII (B) (Note b) 9084 X X X X X X X
- Variable Width Forms Tractor-Paper Handlq 9185 X X X X X X X
- Page Length Ctrl (a) 9550 X X X X X
- SCS Support 9660 X X
- X Print Error Indication 9488 X X X X X X
- Character Print Operation 480 Characters 9520 X X X
- 960 Characters 9521 X X
- 1920 Characters 9522 X X X X X
- 2560 Characters 9523 X X
- 3440 Characters 9524 X X
- 5648 Char. (Note c) 9525 X
- System Attach... see Specify X X X X X X X
- Blower 9030 X X X X X X X

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that can be understood and used by the operator. See Customer Responsibilities below.

Customer Set-Up (CSU): The 3287 is designated as Customer Set-Up thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:
- Adequate site, system and other vendor preparation.
- Receipt at the customer’s receiving dock, unpacking, and placement of the 3287.
- Physical set-up, connection of cables, switch settings, and checkout.
- Contact Field Engineering to make cable connections of IBM CSU units to IBM non CSU units where customer access areas are not provided.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.
- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removal to the customer shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.
- Providing a desk or table top to support the 3287.

NOTES:

(a) Do not specify if Data Analysis-APL Feature (#1066) is selected for attachment to the 3271 or 3272 Control Unit.
(b) Cannot be installed with SCS Support (#9960) or APL/Text (#1120).
(c) For use of the 3287 mdl 1 or 2 as a Console Printer.
(d) For Terminal Adapter Type B on the 3274 Control Unit select from Specify Features #9520 and #9522 for Character Print Operations. For Terminal Adapter Type A Specify Feature #9520 is not required. Specify Features #9521, 9523, 9524, 9525 and 9660 cannot be selected for Terminal Adapter Type B.
(e) Not applicable to 3274 mdl 1B.

SPECIFY: [1] Plug (120 V AC, 1-phase, 3-wire, 60 Hz): #99890 for locking plug, or #9891 for non-lock plug.
[2] Power Cord: If standard 2.6m (9 foot) power cord is not desired, specify #9511 for 1.8m (6 foot) power cord, #9512 for 3.7m (12 foot) power cord, or #9513 for 4.5m (15 foot) power cord.

NOT TO BE REPRODUCED WITHOUT WRITTEN PERMISSION.
To specify the printer buffer size when the printer is used in 3270 data stream mode.

#9521 -- (960 character print operation) for use with a program which requires a printer buffer size of 960 bytes while using Erase/Write Alternate Command.

#9522 -- (1920 character print operation) for use with a program which requires a printer buffer size of 1920 bytes while using Erase/Write Alternate Command.

#9523 -- (2560 character print operation) for use with a program which requires a printer buffer size of 2560 bytes while using Erase/Write Alternate Command.

PREREQUISITE: Extended Print Buffer (#3860).

#9524 -- (3440 character print operation) for use with a program which requires a printer buffer size of 3440 bytes while using Erase/Write Alternate Command.

PREREQUISITE: Extended Print Buffer (#3860).

#9525 (3564 character print operation) -- for use with a program which requires a printer buffer size of 3564 bytes while using Erase/Write Alternate command. PREREQUISITE: Extended Print Buffer (#3860). Limitation: This specify code only valid when 3287 is attached to a 3274 mdl 1A, 1C or 1D.

NOTE: To provide compatibility with current application programs on the 3270 Information Display System the customer can use an Erase/Write command for Specifying #9521 to provide 480 character print operation and Specify #9522, #9523, #9524 and #9525 to provide 1920 character print operation. Allowable usage in SNA Character String of the full buffer varies according to the control unit (3274 of 3276) to which the printer is attached and to programming considerations. See IBM 3270 Information Display System Component Description, GA27-2749, for details. Copy operation from larger screen display to smaller printer buffer is not acceptable.

3278 PRINTER ATTACHMENT TABLE

<table>
<thead>
<tr>
<th>Character Print Operation</th>
<th>3276 Mdl</th>
<th>120</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
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<tbody>
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<td>480 bytes</td>
<td>1</td>
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<td>No</td>
<td>No</td>
<td>No</td>
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<td>1920 bytes</td>
<td>2</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>2560 bytes</td>
<td>3</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
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<td>3440 bytes</td>
<td>4</td>
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<td>Yes</td>
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<td>3564 bytes</td>
<td>5</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

NOTE: 3276 mdl 1, 2 and 3 with the SDLC/BSC Switch feature installed and operating in SDLC mode will support all 3287 character print operations except 3564 Character Print Operation (#9523), (see previous Copy operation restriction).

[10] Blower (#9303): Must be specified for 3276 mdl 1 or 2 to be used in an environment above 32.3°C (90°F) ambient temperature (specification limits up to 40.5°C (104°F). Not recommended for field installation.

[11] System Attachment: Identify the attaching Control Unit or the native attached Host Processor by specifying the following code.

Control Unit/ Natively Attached Host Processor

Code

<table>
<thead>
<tr>
<th>3271</th>
<th>#9251</th>
<th>3276, 1-4</th>
<th>#9552</th>
</tr>
</thead>
<tbody>
<tr>
<td>3272</td>
<td>#9252</td>
<td>3276, 11-14</td>
<td>#9553</td>
</tr>
<tr>
<td>3274-1A</td>
<td>#9549</td>
<td>3791</td>
<td>#9253</td>
</tr>
<tr>
<td>3274-1B</td>
<td>#9554</td>
<td>S/370 mdl 138</td>
<td>#9254</td>
</tr>
<tr>
<td>3274-1C</td>
<td>#9551</td>
<td>S/370 mdl 148</td>
<td>#9255</td>
</tr>
<tr>
<td>3274-1D</td>
<td>#9261</td>
<td>8101 (direct attach)</td>
<td>#9066</td>
</tr>
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</table>

PRICES: Mdl MRC MLC 2 yr Purchase MMMC

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<thead>
<tr>
<th>3278</th>
<th>1</th>
<th>$167</th>
<th>$142</th>
<th>$5,680</th>
<th>$47</th>
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<tbody>
<tr>
<td>2</td>
<td>203</td>
<td>173</td>
<td>6,055</td>
<td>58</td>
<td></td>
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</tbody>
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Plan Offering: Plan B Warrant: 3 Year Component Group: A Useful Life Category: 2 Parking: 1 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 5%

Customer Set-Up Designated: Yes.

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

From Model 1 to Model 2 .... $ 375

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3287 Printer Models 1 and 2 (cont'd)

SPECIAL FEATURES

(For details, see Special Feature descriptions.)

**Data Analysis-APL**

- **Feature (Note a)** #1066 X
- **APL/Text (Note c)** 1120 X
- **ECSA (Note c)** 3610 X
- **Ext Print Buffer** 3680 X
- **Friction Fd Paper Hndg** 4110 X
- **3271/3272 Attachment** 8330 X
- **3274/3276 Attachment** 8331 X

**Var. Width Forms Tractor**

- **(AA) = 3271/3272 Control Unit**
- **(BB) = 3274 Control Unit**
- **(CC) = 3276 Control Unit Display Station**
- **(DD) = 3791 Control Unit**
- **(EE) = 5/370 mdl 138/148 (Note b)**
- **(FF) = 8100 System (6101 attach)**

**NOTES:**

(a) Cannot install Page Length Control (#9550) or Character Set (#9082 or #9083) and Data Analysis-APL Feature (#1066) on the same machine.

(b) For use of 3287 as a console printer.

(c) Cannot be installed on a 3287 that will attach to a 3274 mdl 18.

**DATA ANALYSIS-APL FEATURE (#1066).**

Dual-case EBCDIC, the APL set, and support of TN characters defined in Type Catalog, S/370 Printers, under "TN Text Printing."

**Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with Page Length Control (#9550). Character Set #9082 or #9084. 3271/3272 Attachment (#9330) to a 3274, or 3274/3276 Attachment (#8331).

**Prerequisites:** 1920 Character Print Operation (#9522) on 3271/3272 Attachment Feature (#1066). 3271/3272 Attachment Feature (#1066) on 3287 mdl 2 or 12, or 3274 mdl 2. Note: Not supported as a 5/370 mdl 138/148 console printer for the 3791 or 8100 System when attached by feature #8330, or when attached to any 4300 Processor.

**APL/TEXT (#1120).**

Provides the capability for printing the 222-character APL/Text character set including the 94-character EBCDIC character set. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with 3271/3272 Attachment (#8330), or on a 3287 Printer which is to attach to a 3274 without APL/Text Control feature (#1067) or 3274 mdl 1B control unit, or to a 3274 Control Unit customized without the APL/Text Control Function, or when attached to any 4300 Processor. ASCII-(B) Character Set (#9084) cannot be specified with this feature. **Prerequisites:** Extended Character Set Adapter (#3610) and EBCDIC Character Set (#9082).

**EXTENDED CHARACTER SET ADAPTER (#3610).**

Provides the additional control and buffering necessary to access the extended character set in APL/Text (#1120) feature. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitation:** Cannot be installed with 3271/3272 Attachment (#8330). **Corequisite:** APL/Text (#1120).

**EXTENDED PRINT BUFFER (#3880).**

Provides additional buffer storage which allows 2560, 3440 or 3544 character print operation on the 3287. See SRL GA27-2749 for details. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with 3271/3272 Attachment (#8330). Allowable usage in SNA Character String of the full buffer varies according to the control unit (3274 or 3276) to which the printer is attached and to programming considerations. See IBM 3270 Information Display System Component Description, GA 27-2749, for details.

**FRICION FEED PAPER HANDLING (#4110).**

For friction feeding of single part non-preprinted continuous and fan fold paper with a minimum width of 203mm (6 inches). Included in this feature is a paper tear bar for tearing continuous forms approximately 64mm (21/2 inches) above the printline. Feature #4110 is used interchangeably with the Variable Width Forms Tractor and is attached and removed by the customer. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** Yes.

**3271/3272 ATTACHMENT (#8330).**

Provides one interface for attachment of a 3276 mdl 2 or a 3274 Control Unit mdl 1A, 1B, 1C or 1D, or a 3271 Controller, an 8101 Storage and Input/Output Unit, or a 3276 Control Unit Customization Unit or 3274 Control Unit mdl 1A, 1B, 1C or 1D, a 3791 Controller, an 8101 Storage and Input/Output Unit, or a 3276 Control Unit Customization Unit or 3274 Control Unit mdl 1A, 1B, 1C or 1D, or a 3276 Control Unit Display Station to any 3274. Provides buffer storage required for print operation. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with Extended Character Set Adapter (#3610), or with 3274/3276 Attachment (#8331) or Data Analysis-APL Feature (#1066) to a 3274. **Prerequisites:** For 3271/3272 Control Unit -- available port or added feature #3250 on a 3271 mdl 1, 2, 11 or 12, or 3272 mdl 1 or 2 ... see M 3271 or M 3272 pages. For 3274 Control Unit -- an available Type B port or added Type B Adapter ... see M 3274 pages. For 3791 Controller ... Device Attachment Type II (#7911/7912) ... see M 3791 pages. For 8101 Storage and Input/Output Unit ... Display and Printer Adapter (#1505) or Display and Printer Additional (#1506) ... see M 8100 Information System. For S/370 mdl 138 or 148 -- an Integrated Console Printer Adapter (#9452) ... see M 3138, M 3148 pages.

**3274/3276 ATTACHMENT (#8331).**

Provides one interface for attachment of a 3276 mdl 1 or 2 to a 3274 Control Unit mdl 1A, 1B, 1C or 1D, or to a 3276 Control Unit Display Station mdl 1, 2, 3, 4, 11, 12, 13 or 14, or to any 4300 Processor. Provides buffer storage required for print operation. Included in this feature is Buffer Reprint support. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** No. **Limitations:** Cannot be installed with 3271/3272 Attachment (#8330) or Data Analysis-APL Feature (#1066). **Prerequisites:** An available port or added feature #3255, #3256, #3257 on a 3276, or an available Type A port or added Type A Adapter on a 3274, or an available port on the 4331 Processor Display/Printer Adapter, or an available console position on a 4341 Processor.

**VARIABLE WIDTH FORMS TRACTOR (#8700).**

A forms feeding device for continuous margin punched forms. Overall forms width from 76.2mm to 381.0mm (3 to 15 inches) can be fed. **Maximum:** One. **Field Installation:** Yes. **Customer Set-Up:** Yes. **Prerequisites:** Variable Width Forms Tractor-Covers (#9550) and Variable Width Forms Tractor - Paper Handling (#9156) where there is a requirement to handle forms with an overall width from 76.2 to 203.2 mm (3 to 8 inches).

**Special Feature Prices:**

- **MRC**
  - 2 yr Purchase **MMC**
  - **MLC**

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<thead>
<tr>
<th>Data Analysis-APL Fee</th>
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<th>$9</th>
<th>$315</th>
<th>N/C</th>
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<td>5</td>
<td>5</td>
<td>175</td>
<td>$.50</td>
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<td>Ext Char Set Adapter</td>
<td>3810</td>
<td>15</td>
<td>13</td>
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<td>455</td>
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<td>Extended Printhead</td>
<td>3804</td>
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<td>Var Width Forms Tractor</td>
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<td>5</td>
<td>5</td>
<td>160</td>
<td>$.50</td>
</tr>
</tbody>
</table>

**Accessory Feature:** Available on a purchase only basis. For shipment with machine, order number indicated below at the purchase price indicated on the M 10000 pages for additional information and field installation.

**FORMS STAND (#4450).**

Provides placement of continuous forms on stand above floor level and provides for stacking after printing.
IBM DP Machines

IBM 3287 PRINTER Models 11 and 12

Purpose: Provides hard copy output for the 8100 Information System via Loop attachment.

Model 11 80 cps maximum bi-directional printer.

Model 12 120 cps maximum bi-directional printer.

Note: Actual printer throughput is dependent upon operational and system characteristics. Factors such as controller configuration, line/letter speed, output format, and programming application processing must all be considered in determining actual throughput.

Highlights: The 3287 models 11 and 12 consist of Loop communication functions, printer and indicator lights in one integrally designed desk-top unit. EBCDIC, Decimal, Audible Alarm, and Cancel Print are provided as standard functions. Variable Width Forms Tractor and Friction Feed Paper Handling are available as special features.

The printer operates in SCS mode, which provides for customer program definable horizontal and vertical formatting, including line density (6 or 8 lines per inch). Operator capability to set the page length, page width, and the line density from the operator panel is available via RPQ.

Printer: Maximum printer throughput is obtained with bi-directional serial matrix printing and indexing without unnecessary print head movement. The printer dot matrix is 4 of 7 wide by 8 high giving high legibility with character spacing at 10 characters per inch. Line spacing is 6 and 8 lines to the inch. Up to 152 characters can be printed on a line. Up to 6 part forms with total thickness of .457 mm (0.018 inches) may be used. For any multi-part or pre-printed continuous forms, the Variable Width Forms Tractor (#8700) is recommended. Five and six part continuous forms should be tested on an individual basis for acceptable feeding, registration and print quality. Maximum overall forms width is 381 mm (15 inches); card stock forms are not recommended. (See G24-3488 for form specifications and limitations.)

The Friction Feed Paper Handling (#4110) is recommended for use with non-preprinted single part roll or fan-fold paper, with a minimum width of 203 mm (8 inches), when the Variable Width Forms Tractor (#8700) is not used. Maximum overall forms width is 378 mm (14.8 inches) and stock forms are not recommended. (See G24-3488 for form specifications and limitations.)

Problem Determination Procedure: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that can be understood and used by the operator. See Customer Responsibilities below.

Customer Set-up (CSU): The 3287 is designated as Customer Set-up thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at the customer’s receiving dock, unpacking and placement of the 3287.
- Physical set-up connection of cables, switch settings and check-out.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.
- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removals to the customer shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM.
- Providing a desk or table top to support the 3287.

Prerequisites: For direct attached Loop operation - #4830 or #4835 on the 8100 System. For data link attached Loop operation - a 3842 Loop Control Unit.

Bibliography: See KWIC Index, G20-1621, or specific system bibliography.

Supplies: A black ribbon, IBM Part No. 1136653 or equivalent, is required.

Specify: [1] Plugs (120 V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug or #9891 for non-locking plug.
[2] Power Cord: If standard 2.8 meter (9 foot) power cord is not desired, specify #9511 for 1.8 meter (6 foot) power cord, #9512 for 3.7 meter (12 foot), or #9513 for 4.5 meter (15 foot) power cord.

Model Changes: Can be made in the field.

Model Upgrade Purchase Price (there are no additional installation charges)

From Model 11 to Model 12: $375

Note: Model changes from models 1 and 2 to models 11 and 12 are not recommended for field installation.

SPECIAL FEATURES

One of the following two features must be ordered, or both features may be ordered.

FRICION FEED PAPER HANDLING (#4110). For friction feeding of a single part non-preprinted continuous and fan fold paper with a minimum width of 203 mm (8 inches). Included in this feature is a paper tear bar for tearing continuous forms approximately 64 mm (2.5 inches) above the print line. #4110 is used interchangeably with the Variable Width Forms Tractor and is attached and removed by the customer. Maximum: One. Field installation: Yes. Customer Set-up: Yes.

VARIABLE WIDTH FORMS TRACTOR (#8700). A forms feeding device for continuous margin punched forms. Overall forms width from 76.2 to 381.0 mm (3 to 15 inches) can be fed. Maximum: One. Field installation: Yes. Customer Set-up: Yes. Prerequisite: Variable Width Forms Tractor Paper Handling (#9185) where there is a requirement to handle forms with an overall width from 76.2 to 203.2 mm (3 to 8 inches).

Note: For applications that require forms skipping the Variable Width Forms Tractor (#8700) is recommended.

Special feature Prices:

<table>
<thead>
<tr>
<th>MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 yr</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friction Fd Paper Handleg #4110</td>
<td>$6</td>
<td>$5</td>
</tr>
<tr>
<td>Variable Width Forms Tractor</td>
<td>$8700</td>
<td>6</td>
</tr>
</tbody>
</table>

Accessory Feature: Available on a purchase only basis. For shipment with machine, order number indicated below at the purchase price indicated in the M10000 pages. See M10000 pages for additional information and field installation.

FORMS STAND (#4450). Permits placement of continuous forms on stand above floor level and provides for stacking after printing.

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**IBM 3288 LINE PRINTER**

**Purpose:** Provides hard copy output at speeds up to 120 LPM.

**NOTE:** For possible use with S/3, see GSD manual.

**Highlights:** Printing is from characters engraved on a revolving print belt. Included as standard is one interchangeable print belt. Provides hard copy output at a speed of up to 120 LPM (64 character set, EBCDIC or ASCII) or up to 80 LPM (120 character set, EBCDIC) only; see character set in "Specify" below. May print from the CPU or the contents of a 3277 Display Station via the 3271 mld 2 or 12, 3272 mld 2, or 3274 mld 1A, 1B, 1C or 1D. When attached to a 8101 of a 8100 System the 3288 prints under control of the operating system.

Prints 10 characters per inch, 132 characters or positions per line at 6 lines per inch on continuous fan-fold paper. The paper handling mechanism is adjustable to accept paper from widths of 3.5” (8.9cm) to 15.0” (38.10cm). Paper up to 6 parts plus carbon (maximum total thickness is .020” or .50mm) can be accommodated. Use of card stock forms is not recommended (refer to Forms Design Reference Guide for Printers, GA24-3468). Forms jam detection is provided.

**For use with 3790 Communication System:** A 3271 or 3272 is not required when the 3288 is attached to the 3791. For additional information see the 3791 Configurator, GA27-2768-6. For power, see Specify [1] below; for cable, see M10000 for 3790. Host programs written for the IBM 3270 are not supported by the 3790 System.

**For use with the 8100 Information System:** For special features that are not supported, see M 8101 pages. A 3271 or 3272 is not required when the 3288 mld 2 is attached to the 8101 with #1505 or #1506. For character set specify #9090. For power, see Specify [1] below; for cable, see M10000 pages for 8100 System. Host programs written for the 3270 are not supported by the 8100 System.

**NOTES:** (1) The 3288 Line Printer is recommended for use in a machine room environment due to its higher noise printing. (2) The 3288 is supported by programming as a 3286 mld 2 or 12 printer, unless Text Print Feature (#7880) is installed. The 3288 Text Data Stream, required for program support of feature #7880, is described in the 3270 Component Description Manual and (TNLs).

**PREREQUISITE:** A 3271 mld 2 or 12, 3272 mld 2, or 3274 mld 1A, 1B, 1C or 1D, with appropriate Device/Terminal Adapter, or 8101 with #1505 or #1506. See M 8101 pages.

**Supplies:** A black ribbon, IBM Part No. 1136634 or equivalent, is required.

**Bibliography:** See KWIC Index G320-1621 or specific system bibliography.

**SPECIFY:** [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9080 for locking plug, or #9881 for non-lock plug.

**[2] Character Set:** Specify one of the following:

- **#9090** — for EBCDIC Character Set (available at time of manufacture only) ... provides the 64 characters described on the EBCDIC typewriter keyboard. **PREREQUISITE:** If used with the 3271 mld 2, EBCDIC Transmission Code (#9761) is required on the 3271 mld 2. 

- **#9091** — for ASCII Character Set (A) (available at time of manufacture only) ... provides the 64 ASCII characters but substitutes the Logical OR (\( \wedge \)) and Logical NOT (\( \neg \)) in place of the exclamation mark (!) and circumflex (^). **PREREQUISITE:** If used with the 3271 mld 2, ASCII Transmission Code (#9762) is required on the 3271 mld 2. 

- **#9092** — for ASCII Character Set (B) (available at time of manufacture only) ... provides the standard 64 ASCII characters. **PREREQUISITE:** If used with the 3271 mld 2, ASCII Transmission Code (#9762) is required on the 3271 mld 2. 

- **#9093** — for EBCDIC 'TN/TIl' Character Set, with Sans Serif font print belt ... (available at time of manufacture only). ... provides the 120 characters of the 'TN/TIl' print train (see Type Catalog, S/370 Printers page). **Prerequisites:** Text Print Feature (#7880). If used with the 3271 mld 2, EBCDIC Transmission Code (#9761) is required on the 3271 mld 2.

**[3] X Print Error Indication:** Specify #9944. To indicate an error an X is printed on the print line immediately below the last line normally printed.

**[4] Vertical Forms Control:** Specify #9850. Allows customer insertion of a Forms Feed Character (Hex OC) into the data stream. Upon detection of the Forms Feed character, the printer will skip to the first print line of the next form. The form length is entered into two decade switches by the operator and is variable from 00 to 99. (The implementation of this feature is the customer's responsibility.)


**ETP/MAC/MGC**

**PRICES:**

- **3288**
  - Mdl 2: $384 MRC 2 yr Purchase $10,625 $91

**ACCESSORIES:** The following items are available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

**FORMS STAND (#4450)** — Permits feeding of continuous forms from the carton and provides for forms stacking after printing. This accessory is a one-shelf forms stand.

**EBCDIC PRINT BELT (#5920-Additional)**. Permits printing of the 64 character set.

**TEXT PRINT BELT (#5921-Additional)**. Sans Serif font character. Permits printing of the 120-character TN/TIl character set.

---

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Purpose: A series of line printers for attachment to a 3274 Control Unit, a 3276 Control Unit Display Station, or an 8100 Information System via the Loop, at carrier speed and data rate of 9600 bps maximum.

Highlights: Line printing is from characters engraved on a revolving metal belt. The 3289 models operate at the following speeds:

<table>
<thead>
<tr>
<th>Model</th>
<th>Maximum Lines Per Minute</th>
<th>Character Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>150</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>120</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>40</td>
<td>125 Text</td>
</tr>
<tr>
<td>Model 2 and 3</td>
<td>400</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>300</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>230</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>160</td>
<td>125 Text</td>
</tr>
</tbody>
</table>

* Actual printer throughput is dependent on operational and system characteristics. Maximum print speed may be degraded by such factors as communication line speed, control unit load, application program, loop speed, print line length, and multiple device operation.

Included is one interchangeable print belt (48, 64 or 94 character set) — see "Specify." A variable width forms tractor for feeding of marginally punched continuous forms (one to six parts) up to 15" overall width is provided. The following functions are basic: paper jam detection; front forms set) --- see Included print positions; character spacing of marginally overall Printer Communications

Limitations: Refer to GA24-3488 for forms design considerations. Printed output is not supported for possible. See Special Features.

PROPRIETARY: For mdls 1, 2, a 3274 Control Unit with appropriate adapter, or a 3276 Control Unit Display Station. See 3274 and 2276 for details. For mdls 3, an 8100 Loop is required. See 8100 Processor pages for details.

Problem Determination Procedures — Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. See Customer Responsibilities below.

Customer Set-Up (CSU) — The 3289 mdls 1 and 2 are designed as Customer Set-Up to thereby offering the customer early availability and relocation flexibility. Pre-installation Planning responsibilities are covered in 3270 Set-Up Planning Guide, GA27-2827.

Customer Responsibilities: The customer is responsible for:
- Adequate site, system and other vendor preparation.
- Receipt at the customer's receiving dock, unpacking, and placement of the 3289.
- Physical setup, connection of cables, switch settings, and check out. (Mdls 1 and 2)
- Notify IBM of intent to relocate and follow IBM instructions for relocation. (Mdls 1 and 2)
- Use and follow the problem determination procedures and fill out trouble report prior to calling IBM for service.
- Disconnecting, packing, and removal to the customer's shipping dock at the time of discontinuance. Appropriate instructions will be provided by IBM. (Mdls 1 and 2)

Supplies: Black ribbon, IBM Part No. 1136634 or equivalent for model 1, or IBM Part No. 1136670 or equivalent for models 2 and 3, are required.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Specify: [1] Voltage (120 AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, or #9991 for non-lock plug.

[2] Power Cord: If standard 2.8m (9 foot) power cord is not desired, specify #9511 for 1.8m (6 foot) power cord, #9512 for 3.7m (12 foot) power cord, or #9513 for 4.6m (15 foot) power cord.

[3] Print Belt Character Set: Specify One. Available at time of manufacture only. If more than one belt is required, see Accessories below and M10000 pages.

#9490 -- 48 Character Set EBCDIC
#9491 -- 64 Character Set EBCDIC
#9492 -- 94 Character Set EBCDIC
#9493 -- 48 Character Set ASCII (B)**
#9494 -- 64 Character Set ASCII (B)**
#9495 -- 94 Character Set ASCII (B)**
#9496 -- 125 Character Text Print EBCDIC

** SNA Character String Mode of Operation is not available with ASCII. ASCII belts available for models 1 and 2 only.

NOTE: The Character Set specified (EBCDIC or ASCII) must be the same as the Transmission Code/Character Set used on the control unit to which it is attached.


[5] Print Error Indication #9488: An error graphic is printed on line immediately below the last print line for that data buffer when the printer is used in 3270 data stream mode. Limitation: Model 1 and 2 only.

[6] Character Print Operation: To specify the printer buffer size when the printer is used in 3270 data stream mode. Limitation: Model 1 and 2 only.

#9521 (960 character print) ... for use with a program which assumes the buffer size is 960 bytes while using Erase/Write Alternate Command.

#9522 (1920 character print) ... for use with a program which assumes the buffer size is 1920 bytes while using Erase/Write Alternate Command.

#9523 (2560 character print) ... for use with a program which assumes the buffer size is 2560 bytes while using Erase/Write Alternate Command.

#9524 (3440 character print) ... for use with a program which assumes the buffer size is 3440 bytes while using Erase/Write Alternate Command.

#9525 (3564 character print operation) ... for use with a program which assumes the buffer size is 3564 bytes while using Erase/Write Alternate Command. This specification code only valid when 3289 is attached to a 3274 mdl 1A, 1C or 1D.

NOTE: To provide compatibility with programs written for 3271/3272 using Erase/Write Command, #9522, #9523, #9524 and #9525 provide 1920 character print operation. Allowable usage in SNA Character String of the full buffer varies according to the control unit (3274 or 3276) to which the printer is attached and to programming considerations. See IBM Information Display Component Description, SRL GA27-2748, for details. Copy operation from larger screen size display to smaller printer buffer is not accepted.

[7] System Attachment: Identify the attaching control unit by specifying the following codes:

<table>
<thead>
<tr>
<th>Control Unit</th>
<th>Code</th>
<th>System</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>3274 mdl 1A</td>
<td>#9549</td>
<td>3276 mdl 1-4</td>
<td>#9552</td>
</tr>
<tr>
<td>3274 mdl 1B</td>
<td>#9550</td>
<td>3276 mdl 11-14</td>
<td>#9553</td>
</tr>
<tr>
<td>3274 mdl 1C</td>
<td>#9551</td>
<td>8100</td>
<td>#9606</td>
</tr>
<tr>
<td>3274 mdl 1D</td>
<td>#9261</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PRICES: Mdl MRC MLC 2 year Purchased MMMMC

| 3289 | S368 | S313 | 6,900 | S105 |
| 2    | 556  | 473  | 13,250 | 179  |
| 3    | 556  | 473  | 13,250 | 179  |

Plan Offering: Plan B Warranty: B Machine Group: A Purchase Option: 55% Useful Life Category: 2 Per Call: 1 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 5%

Model Changes: Not field installable.

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SPECIAL FEATURES

AUDIBLE ALARM (#1090). Sounds an alarm that alerts the operator of conditions that require manual intervention. The operator can set loudness level and, on models 1 and 2 only, duration (short or continuous). Field Installation: Yes. Customer Set-Up: No.

TEXT PRINT FEATURE (#1130). [Mdl 1 and 2 only] Provides the capability to print 32 Text characters in addition to 93 character print of the 94-character EBCDIC set. 3299 Line Printers with and without this feature may be mixed on the 3276 Control Unit Display with APL/Text Control feature (#1067) or on the same appropriately configured 3274 Control Unit along with 3278 Display Stations and 3279 Printers with and without the APL/Text (#1120) feature and on the 3274 only, may be mixed with 3277 Display Stations and 3284, 3286, 3287 and 3288 printers without the Data Analysis-APL (#1066) feature. Limitations: The Text print belt used with this feature is only interchangeable with the 48/64/94-character set EBCDIC print belt. This feature is only valid on a 3299 Line Printer attached to a 3274 mdl 1A, 1C or 1D, customized to include the 3289 Text Print Control Function or to a 3276 with APL/Text Control feature (#1067). Maximum: One. Field Installation: Yes. Customer Set-Up: No. Prerequisite: For new orders, use Print Belt Character Set specify code #9496. For field installation, an order for a Text Print Belt, Additional (#5824) must accompany the order for this feature (#1130).

KEYLOCK (#4650). [Mdl 3 only] Provides a mechanical key-lock to activate controls that disable all operator activity related to input, output, or control of data at the printer. Two identical keys are supplied with the feature. Refer to M10000 pages for information on additional or replacement keys. Field installation: Yes. Customer Set-Up: No.


3782/3521 CARD PUNCH ATTACHMENT (#1850). [Mdl 3 only] To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. Maximum: One. Limitations: If a 2502 or 3501 Card Reader is also attached (#8050 or #8149), the Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only. Simultaneous operation of a 3521 equipped with Card Print Feature (#1850) with a Card Reader (3501 or 2502) is not permitted. Simultaneous operation of printer, reader, and punch without Card Print is permitted. Prerequisite: Card Control Feature (#8010). Field installation: Yes. Customer Set-Up: No.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC</th>
<th>2 yr</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audible Alarm</td>
<td>#1090</td>
<td>$6</td>
<td>$5</td>
<td>$175</td>
</tr>
<tr>
<td>Text Print Feature</td>
<td>1130</td>
<td>7</td>
<td>6</td>
<td>210</td>
</tr>
<tr>
<td>Keylock</td>
<td>4650</td>
<td>35</td>
<td>SUC</td>
<td>35</td>
</tr>
<tr>
<td>Card Control Feature</td>
<td>8010</td>
<td>29</td>
<td>25</td>
<td>875</td>
</tr>
<tr>
<td>3501 Card Reader Attachment</td>
<td>8050</td>
<td>13</td>
<td>11</td>
<td>440</td>
</tr>
<tr>
<td>3782/2502 Cdr Rdr Attch</td>
<td>8149</td>
<td>19</td>
<td>16</td>
<td>640</td>
</tr>
<tr>
<td>3782/3521 Cdr Pchr Attch</td>
<td>8150</td>
<td>19</td>
<td>16</td>
<td>640</td>
</tr>
</tbody>
</table>

Accessories: The following items are available on a purchase only basis. For shipment with machine order the feature # indicated below at the price listed in the M10000 pages. See M10000 pages for additional information and field installation.

Print Belt, Additional -- permits the customer to obtain more than one character set print belt.

#5811 -- 46-character ASCII (B) *
#5812 -- 64-character ASCII (B) *
#5813 -- 94-character ASCII (B) *
#5821 -- 46-character EBCDIC
#5822 -- 64-character EBCDIC
#5823 -- 94-character EBCDIC
#5824 -- 125-character Text Print EBCDIC

* Models 1 and 2 only.

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IBM 3289 LINE PRINTER
Model 4

Purpose: A line printer for attachment to a 4331 Processor.

Highlights: Line printing is from characters engraved on a revolving metal belt. The 3289 mdl 4 operates at the following speeds:

<table>
<thead>
<tr>
<th>Maximum Lines Per Minute *</th>
<th>Character Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>48</td>
</tr>
<tr>
<td>300</td>
<td>64</td>
</tr>
<tr>
<td>230</td>
<td>94</td>
</tr>
</tbody>
</table>

* Actual throughput is dependent upon operational and system characteristics. Maximum print speed may be degraded by such factors as control unit load and the application program.

Included is one interchangeable print belt (48, 64, or 94 character set). See "Specify." A variable width forms tractor for feeding marginally punched continuous forms (one to six parts) up to 38.1 cm (15") overall width is provided. The following functions are basic: paper jam detection ... end of forms detection ... character set buffer ... character spacing of 6 or 8 lines per inch and vertical channel select (under 4331 Processor control). The standard color accent panel is pebble grey.

Limitations: Refer to Forms Design Reference Guide, GA24-3488 for forms design considerations. Printed output is not supported for optical character reading.

Prerequisite: A position on the standard Display/Printer Adapter on a 4331 Processor, see 4331 for details.

Problem Determination Procedures: Significant function has been designed into this unit to increase availability to the customer. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the customer. See "Customer Responsibilities" below.

Customer Setup (CSU): The 3289 mdl 4 is designated as Customer Setup thereby offering the customer early availability and relocation flexibility. Pre-installation planning responsibilities are covered in 3289 Model 4 Site Preparation Guide, GA27-3198.

Customer Responsibilities: The customer is responsible for:

- Adequate site, system and other vender preparation.
- Receipt at the customer receiving dock, unpacking and placement of the 3289.
- Physical setup, connection of cables, switch settings and check out.
- Contacting Field Engineering to make cable connections of IBM CSU units to IBM non-CSU units where customer access areas are not provided.
- Notifying IBM of intent to relocate and following IBM instructions for relocation.
- Using and following the problem determination procedures and filling out the trouble report prior to calling IBM for service.
- Disconnecting, packing and removal to the customer's shipping dock at time of discontinuance. Appropriate instructions will be provided by IBM.

Supplies: Black ribbons, IBM Part No. 1136670, or equivalent, are required.

Bibliography: See KWIC Index, G320-1621, or specific system bibliography.

SPECIFY

- Voltage (120V AC, 1-phase, 3-wire, 60 Hz): #9890 for locking plug, #9891 for non-lock plug.
- Power Cord: If standard 2.8 meter (9 foot) power cord is not desired, specify #9511 for 1.8 meter (6 foot) cord, #9512 for 3.7 meter (12 foot) cord, or #9513 for 4.6 meter (15 foot) cord.
- Print Belt Character Set: Specify One. Available at time of manufacture only. If more than one print belt is required, see "Accessories" below and M 10000 pages.
  - #9490 = 48-character set EBCDIC
  - #9491 = 64-character set EBCDIC
  - #9492 = 94-character set EBCDIC
- Cables: Customer is responsible for procurement, installation and maintenance of coaxial signal cable. See M 10000 pages for cable prices and ordering instructions. For cable details, see 3270 Installation Manual - Physical Planning, GA27-2787.

Prices:

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MRC</th>
<th>2Yr</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3289</td>
<td>4</td>
<td>$556</td>
<td>$473</td>
<td>$113,250</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B
Warranty: B
Machine Group: A
Purchase Option: 55%
Useful Life Category: 2
Per Calt: 1
Termination Charge Months: 5
Termination Charge Percent: 25%
Upper Limit Percent: 5%

Model Changes: Field changes of Model 2 to/from Model 4 are not recommended. All other 3289 model changes are available at time of manufacture only.

ACCESSORIES: The following items are available on a purchase only basis. For shipment with the 3289, order the Feature # indicated below at the price listed in the M 10000 pages. See M 10000 pages for additional information and field installation.

Print Belt, Additional -- permits the customer to obtain more than one character set print belt.

Description

- #5821 -- 48-character EBCDIC
- #5822 -- 64-character EBCDIC
- #5823 -- 94-character EBCDIC

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IBM MACHINES

IBM 3310 DIRECT ACCESS STORAGE

Purpose: Direct access storage for attachment to a 4331 Processor.

Disk Storage and Control

Model A1: Single-drive disk storage and associated control for attachment to a 4331 Processor via its DASD Adapter (#3201). It also provides the logic required to support attachment of up to three additional spindles for a maximum string of four.

Model A2: Two disk storage drives and associated control for attachment to a 4331 Processor via its DASD Adapter (#3201). It also provides the logic required to support attachment of up to two additional spindles for a maximum string of four.

Disk Storage

Model B1: Single-drive storage unit which attaches to a Model A2 to provide for configurations requiring three (3) drives.

Model B2: Two disk storage drives which attach to a Model A2 to provide for configurations requiring a full string of four (4) drives.

Drive Configurations: Drives are attached as follows:

- One Drive: A 3310 model A1
- Two Drives: A 3310 model A2
- Three Drives: A 3310 model A2 and a 3310 model B1
- Four Drives: A 3310 model A2 and a 3310 model B2

Highlights: The 3310 employs a fixed storage medium and features high data rate, fast access, modularity and a high degree of reliability.

Capacity – each drive has a capacity of 64,520,192 bytes.

Format – uses fixed block architecture and the cylinder concept providing the following:

- Bytes per Sector: 512
- Sectors per Cylinder: 352
- Bytes per Cylinder: 180,224
- Cylinders per Drive: 358

Access Time – Seek Time (MS)

- Minimum: 9
- Average: 27

Average Rotational Delay (MS): 9.6

Data Rate – 1,031,000 bytes per second.

Rotational Positioning Sensing – permits the disk storage device to disconnect during rotational delay, thereby increasing DASD Adapter availability for other operations.

Error Correction – provides capability of correcting single data error bursts of up to 3 bits span as well as detecting all single error bursts of up to 14 bits span.

Prerequisites: A 3310 model A1 or A2 requires a position on the DASD Adapter (#3201) on a 4331 Processor; a 3310 model B1 or B2 requires a 3310 model A2.

Maximum: See DASD Adapter (#3201) under "Special Features" for the 4331 Processor.

Bibliography: GA26-1660

SPECIFY

- Voltage: (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9914 for 240 V.
- Color: [A models only] #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray. Note: One accent panel from the model A unit is exchanged with the outer side panel of the model B unit.

[reverse side is blank]
IBM 3330 DISK STORAGE

Purpose: Large capacity, fast access, high data rate storage for general purpose data storage and programming system residence.

Model 1: Contains two disk storage drives ... available on S/360 mdl 195, any S/370 Processor except 3115, ... available on the 4341 Processor.

Model 2: Contains one disk storage drive ... available on S/360 mdl 195, all S/370 Processors except 3115 ... available on the 4300 Processor.

Model 11: Contains two disk storage drives ... available on all virtual storage S/370 Processors except 3115 and 3125 ... available on the 4341 Processor.

Highlights: Each drive uses an electromagnetic actuator to move and control the head assembly.

Cylinder Concept – 404 data cylinders per pack for mdl 1 and 2, 308 data cylinders per pack for mdl 11. Each cylinder has 19 data tracks ... up to 13,030 bytes per track ... up to 247,570 bytes available per cylinder.

Data Rate – 806,000 bytes per second.

Access Time – average access time is 30 milliseconds with a minimum of 10 milliseconds and a maximum of 56 milliseconds.

Power Drawers – each disk drive is mounted in a drawer ... opened or closed by a switch on the operator control panel.

Write Inhibit Switch – a toggle switch for each drive, mounted on the operator’s panel, which provides the means to protect packs mounted within the facility from being written upon. The switch is manually set by the system operator under instructions from the customer operating procedure. Programming Support then protects the user’s data by terminating a program which attempts to write to a protected drive.

Write Format Release – standard feature on the mdl 11, which frees the subsystem while the drive erases the position on a track ... permits channel disconnect during most of the rotational latency period and thus contributes to increased channel availability ... requires one unshared subchannel on a block multiplexer channel for each drive.

Rotational Position Sensing – enables a “seek” to an explicit positin on a track ... permits channel disconnect during most of the rotational latency period and thus contributes to increased channel availability ... requires one unshared subchannel on a block multiplexer channel for each drive.

Multiple Requesting – allows multiple channel command sequences to be active, up one sequence, up drive permits better utilization of control unit, devices, channel and CPU ... requires one unshared subchannel on a block multiplexer channel for each drive.

Disk Pack – each drive requires a 3336 Disk Pack. The 3336 mdl 1 provides up to 100 million bytes of storage per pack. The 3336 mdl 11 provides up to 200 million bytes of storage per pack. The 3336 mdl 1 is interchangeable on all 3330 mdl 1 and 2 and 3333 mdl 1 drives; it cannot be used with the 3330 mdl 11. The 3336 mdl 11 is interchangeable on all 3330 mdl 11 and 3333 mdl 11 drives; it cannot be used with the 3330 mdl 1 or 2.

PREREQUISITES: The 3330 mdl 1 and 2 are designed for interconnected operation with the 3333 mdl 1, 3333 mdl 11, or the 3830 mdl 1. The 3330 mdl 11 is designed for interconnected operation with the 3333 mdl 1 or mdl 11. Customers who wish to order a 3330 for stand-alone or individual use should submit an RPO to provide the necessary safety elements (covers, cable connectors, etc.) to complete the unit for a non-standard (i.e., not installed as part of a 3330 facility) environment. In lieu of the RPO, the customer may provide safety elements equivalent to the standard configuration or that provided by the above RPO. If not provided, the unit will be offered on a purchase only basis. See item [2] under "Specify." See appropriate DASD storage control feature or machine to determine prerequisite specify and/or special features to attach 3333/3333d.

Agreement for IBM to install and maintain the 3330 in any non-standard configuration must be reviewed.

Each disk storage drive requires a 3336 Disk Pack. These must be ordered separately.

Maximum: Up to four 3330 modules, in any combination of mdls 1 and 2, can be attached to the 3380 mdl 1. Up to three 3330 modules, in any combination of mdls 1, 2 or 11, can be attached to the 3333 mdl 1 or 11 ... see system availability under "Models" above. On the S/370 mdl 125, only one 3330 module, either mdl 1 or 2, can be attached to the 3333 mdl 1. For combinations allowed on Storage Director of a 3300 Storage Control, see "Maximum" under 3880.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wires, 60 Hz): #9903 for 206 V, or #9905 for 230 V ... voltage must be consistent with that of the unit to which the 3330 is to be attached.

[2] Non-standard Environment: #9485 ... must be specified if the 3330 is not to be installed as part of a 3330 facility ... also see "Prerequisites" above.

[3] Position Designator: For cable definition and drive identification (Ready Indicator and Logical Address Plug), one position designator code must be specified for each 3330, indicating its relative position as shown in the diagram below.

<table>
<thead>
<tr>
<th>Model</th>
<th>#9491</th>
<th>#9492</th>
<th>#9493</th>
<th>#9494</th>
</tr>
</thead>
<tbody>
<tr>
<td>3330</td>
<td></td>
<td></td>
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<td>3333</td>
<td>#9492</td>
<td></td>
<td>#9493</td>
<td>#9494</td>
</tr>
</tbody>
</table>

NOTE: If any configuration change (increase or decrease) results in a position change of installed units, their position designator codes must be changed for rental machines.

If an installed 3380 mdl 1/3330 configuration is being changed to a 3380 mdl 2/3330 series configuration and the 3330 with position designator code #9493 has serial no. 12490 or below, BM 227679 (60 Hz) must be ordered via for rental machines.

IBM 3333 DISK STORAGE AND CONTROL

Purpose: Large capacity, fast access, high data rate storage for general purpose data storage and programming system residence with additional control for the attachment of up to three 3330 Disk Storage modules.

Model 1: Contains two disk storage drives. Available on S/360 mdl 195, any S/370 Processor except 3115 ...available on the 4341 Processor.

Model 11: Contains two disk storage drives. Available on all virtual storage S/370 Processors except 3115 or 3125 ... available on 4341 Processor.

Highlights: Each drive uses an electromagnetic actuator to move and control the head assembly.

Cylinder Concept – 404 data cylinders per pack for mdl 1 ... 808 data cylinders per pack for mdl 11. Each cylinder has 19 data tracks ... up to 13,030 bytes per track ... up to 247,570 bytes available per cylinder.

Data Rate – 806,000 bytes per second.

Access Time – average access time is 30 milliseconds with a minimum of 10 milliseconds and a maximum of 55 milliseconds.

Power Drawers – each disk drive is mounted in a drawer ... opened or closed by a switch on the operator control panel.

Write Inhibit Switch – a toggle switch for each drive, mounted on the operator’s panel, which provides the means to protect packs mounted within the facility from being written upon. The switch is manually set by the system operator under instructions from the customer operating procedure. The operating systems program-
3333 Disk Storage and Control (cont'd)

...support then protects the user's data by terminating a program which attempts to write to a protected drive.

Write Format Release—standard feature on the mdl 11, which frees the subsystem while the drive erases from the end of a "formatted" write record to the end of the track.

Rotational Position Sensing—enables a "seek" to an explicit position on a track ... permits channel disconnect during most of the rotational latency period and thus contributes to increased channel availability ... requires one unshared subchannel on a block multiplexer channel for each drive.

Multiple Requesting—allows multiple channel command sequences to be active, up to one sequence per drive ... permits better utilization of control units, devices, channel, and CPU ... requires one unshared subchannel on a block multiplexer channel for each drive.

Disk Pack—each drive requires a 3336 Disk Pack. The 3336 mdl 1 provides up to 100 million bytes of storage per pack. The 3336 mdl 11 provides up to 200 million bytes of storage per pack. The 3336 mdl 1 is interchangeable on all 3333 mdl 1 and 3330 mdl 1 and 2 drives; it cannot be used with the 3333 mdl 11. The 3336 mdl 11 is interchangeable on all 3333 mdl 11 and 3330 mdl 11 drives; it cannot be used with the 3333 mdl 1.

PREREQUISITES: Each disk storage drive requires a 3336 Disk Pack. These must be ordered separately ... see IRD Sales Manual.

See appropriate DASD storage control feature or machine to determine prerequisite specify and/or special features to attach 3333/3330s.

Each system attachment requires a specify code ... see "Specify" below.

NOTE: If a 3333/3330 configuration is replacing a 3830 mdl 1/3330 configuration (or any configuration change is made where installed 3330s are repositioned with respect to a 3333), the position designator Specify codes of the 3330s must be changed ... see 3330.

Maximum: S/370 mdl 125, one 3333 mdl 1 (with associated 3330s) ... For other systems, see 3135, 3135-3, 3136, 3145, 3145-3, 3149, 3158, 3158-3, 3168, 3168-3, 3031, 3032, 3033, 3830 mdl 2, 3830 mdl 3, 3880.

Bibliography: GC20-0001

Maintenance: Agreement for IBM to install and maintain the 3333 in any non-standard configuration must be reviewed

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V. NOTE: The 3333 requires a 60 amp AC power cord. Consult Physical Planning.

[2] System Attachment: One of the following must be specified:

370/125 * #9586 3345 mdl 3, 4, 5 9583
3830 mdl 2 9581 370/158 ISC 9584
370/135, 135-3 IFA 9582 370/158 ISC 9585
370/138 IFA 9579 370/158 ISC w (#7220) 9587
370/145, 145-3 IFA 9583 370/168 ISC w (#7220) 9588
370/148 ISC 9590 3830 mdl 3 9599
3880 9604

* The 370 mdl 125 is not valid for the String Switch (#8150).

PRICES: Mdl MAC MRC ETP/ MMC Purchase

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<th>Mdl</th>
<th>1</th>
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</table>

Plan Offering: Plan B. Per Call: 3 Machine Group: A Purchase Option: 60% Warranty: B Useful Life Category: 1 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

Model Changes: Mdl 1 to mdl 11 is field installable.

When ordering model change for field installation on 3135/3135-3 and 3136 systems, check for appropriate prerequisite specify feature (microcode diskette) on the IFA. Refer to appropriate processing sales manual pages.

MODEL UPGRADE PURCHASE PRICE (There are no additional installation charges)

Model 1 to Model 11 ... $13,710

SPECIAL FEATURES

REMOTE SWITCH ATTACHMENT (#6148). To attach the String Switch (#8150) to a configuration control panel. Field Installation: Yes. Prerequisite: String Switch: (#8150).

STRING SWITCH (#8150). To attach the 3333 to a second attachment. The two attachments may be on the same CPU or different CPUs and may be any two of the following: 3830 Storage Control mds 1, 2, 380 Storage Control, the S/370 mdl 155, 155-3, 138 3330/3340 Series IFÁ (#4555), the 3345 Storage and Control mds 3, 4 and 5 or the ISC (#4680) for attachment to S/370 mds 145, 145-3, 146, and the S/370 mdl 158 and 168 ISCs (#4650) ... see appropriate machines for additional requirements.

The String Switch may also be installed on a 3333 within a 3850 Mass Storage System with attachment to a 3830 mdl 3 or S/370 ISC (#4650) with Staging Adapter (#7220). Installation is not recommended in a mixed 3850 MSS/non-MSS environment. If a 3333 is shared between any two ISC paths and/or 3830 mdl 3s, then any other 3333s attached to the same ISC paths and/or 3830 mdl 3s must also be shared identically. In all of the above cases, switching between the two attachments is under program control. The 3333s may also be dedicated to a single attachment with an enable/disable switch. Field Installation: Yes. Specify: To indicate the attachment to which this feature will be made, specify one of the following:

3830 mdl 2 #9591 370/158 ISC 9594
370/135, 135-3 IFA #9592 370/168 ISC 9595
370/138 IFA #9596 370/168 ISC w (#7220) 9597
3345 mdl 3, 4, 5 #9598 370/168 ISC w (#7220) 9598
370/145, 145-3 ISC #9593 3830 mdl 3 9599
370/148 ISC #9594 3880

NOTE: Installed 3333s retained for use with 3850 Mass Storage System

System Attachment Specify Features must be changed on presently installed 3333s attached to a 3830 mdl 2 or 3158/3186 ISC (#4650). If the 3333s will be retained for use with a 3850 MSS when a 3830 mdl 2 is field upgraded to mdl 3 or Staging Adapter for ISC (#7220) is field installed on the 3158/3186 ISC. Submit

Specify Feature Changes

Remove Install

9581 9589
9591 9599
9594 9587
9595 9598

If the installed 3333s are equipped with String Switch (#8150), the Specify Features Indicative of String Switch attachment are also to be changed

Specify Feature Changes

Remove Install

9581 9591
9591 9599
9594 9597
9595 9598

Special Feature Prices: MRC/ETP/MAC 2 Yr Purchase MMC

Remote Switch Attach #6148 NC NC NC NC NC

String Switch 8150 $223 $190 $3,760 $9.50

3336 DISK PACK

Model 1 — removable and interchangeable disk storage for the 3333 Disk Storage and Control mdl 1 and 3330 Disk Storage mds 1 and 2.

Model 11 — removable and interchangeable disk storage for the 3333 Disk Storage and Control mdl 11 and the 3330 Disk Storage mdl 11.

The 3336 is marketed by IRD ... for details and prices,

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IBM

IBM 3340 DIRECT ACCESS STORAGE FACILITY

Purpose: Multiple capacity, high-speed, direct access storage for attachment to any virtual storage S/370 or 4300 Processors.

For possible use with S/3 or S/7, see GSD manual.

Model A2 Two disk storage drives and associated control for attachment to a 3115 or 3125 via their native attachments, to the 3135, 3135-3, 3136 via the IFA (#4655), to 3145 mdls GE, GFD, H, HG or I via the 3345 md1 3, 4 or 5, to 3145 md1 H2, H2G, I2, H2\(a\), J2, J2S or K2, 3145-3, 3146 via the ISC (#4660), to the 4400 Direct Attach feature (#7851), to the 3156, 3158-3, 3188 or 3166-3 via the ISC (#4650), to the 3830 md1 2, and to the 3880. It provides logic and power for the attachment of up to three 3340 md1 B units and/or 3344 units (3344 not attachable to 4331).

Model B1 Contains one disk storage drive. Can be intermixed with the 3340 md1 B2 and/or 3344 units to provide 3, 6 or 7 drive configurations (3344 not attachable to 4331).

Model B2 Contains two disk storage drives. Up to three 3340 md1 B2 can be attached to a 3340 md1 A2 (3344 not attachable to 4331).

Model Changes: Available at time of manufacture only.

Highlights: Each 3340 contains an air filtration system and the load/unload mechanism for the 3348 Data Module. It features low cost, multiple capacity, fast access and high data rate — up to 4 drives attach to a 3115-0, up to 8 drives to a 3115-2 or a 3125-0, up to 16 drives to a 3125-2 with 16 Drive Expansion (#9315), and up to 16 drives to 4331. See 3135, 3135-3, 3136, 3145, 3145-3, 3148, 3158-3, 3158, 3188-3, 3188, 3198-3, 3931, 3032, 3032, 3034, 3245, 3380, 3880, 4331 or 4341 for other S/370 or 4300 Processor attachment capabilities.

The 3340 introduces a new design in which a sealed cartridge (3348 Data Module) contains the disks, access arms, read/write heads and spindle. Multiple capacity options on each drive become possible due to the modularity provided by this unique design. In addition, the 3346 md1 70F contains fixed heads which provide low cost, fixed head capability for the 3340 user. The user may place selected components of IBM software as well as his own programs in the fixed head area to increase device performance. The 3348 md1 70F requires the Fixed Head Feature on the 3340. See “Special Features.”

Cylinder Concept: 3348 md1 70
3348 md1 35 or 70 F
(34.9 MB) (68.8 MB)

Bytes per Track 8,368 8,368
Tracks per Cylinder 12 12
Cylinders per Data Module 348 696
Bytes per Cylinder 100,416 100,416

Data Rate: 88,000 bytes per second.

Access Time: For the 3348 md1 35 and 70, the average seek time is 25 ms - a minimum of 10 ms and a maximum of 60 ms. For the md1 70F, the average seek time is 17 ms - a minimum of 7 ms for the cylinders 1 through 5 while all other cylinders retain the above seek timing. Rotation time is 20.2 ms and latency is 10.1 ms, the same as for his own programs in the fixed head area to increase device performance. The 3348 md1 70F requires the Fixed Head Feature on the 3340. See “Special Features.”

PREREQUISITES: A 3340 facility requires — a 3340 md1 A2 ... a S/370 or 4300 Processor with appropriate attachment and features ... each 3340 drive requires a 3348 Data Module. A 3145 requires Word Buffer (#8810) to attach 3340A.

See appropriate DASD storage control feature or machine to determine additional prerequisite specify and/or special features to attach 3340A.

Maximum: 3115-0 — four 3340 drives
3115-2 — eight 3340 drives
3125-0 — eight 3340 drives
3125-2 — sixteen 3340 drives
Other S/370 or 4300 Processors — see 3135, 3135-3, 3138, 3185, 3145-3, 3148, 3158-3, 3168, 3168-3, 3031, 3032, 3033, 3345, 3830 md1 2, 3880, 4331 or 4341.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): $9003 for 208 V, or $9005 for 230 V ... must be consistent with system voltage.


[3] System Attachment: One of the following must be specified on each 3340 md1 A2: For System/3 Specify Codes, see GSD manual.

ATTACHMENT SPECIFY ATTACHMENT SPECIFY
3830 md1 2 $9581 S/370 md1 168 ISC $9585
S/370 md1 135 IFA $9582 S/370 md1 125 DDA $9586
S/370 md1 135-3 IFA $9587 S/370 md1 110 DDA $9587
S/370 md1 135 IFA $9579 S/370 md1 115 ISC $9588
S/370 mdls 3, 4, 5 $9583 S/370 md1 145 ISC $9588
S/370 mdls 135-3, 135, 135-4 $9584 S/370 md1 145-3 ISC $9588
S/370 md1 168 ISC $9580 System/7 $9584
S/370 md1 168 ISC $9580 4331 - 3340 Dir Attach $9066
3880 $9067

[4] If String Switch (#8150) is ordered or installed on 3340 md1 A2, String Switch (#9770) must be specified on each 3340 md1 B1 or B2 in the string.

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 3
Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

SPECIAL FEATURES

FIXED HEAD FEATURE (#4301, 4302). #4301 — for model A2 or B2 ... #4302 — for model B1. To operate the 3348 md1 70F on the 3340. The Fixed Head Feature is available on S/370 systems from the 115 and up, and 4300 Processors. Attachment is via the following: On the S/370 mdls 115 and 125 via their native attachment, the 3830 Storage Control mdls Attachment, the 3330/3340 Series IFA (#4655) on the S/370 md1 135, 135-3, 138, the 3348 Storage Control Frame md1 3, 4 or 5 or the S/370 md1 145, 145-3, 148, the S/370 md1 158 and 168 ISCs (#4650), and to the 4331 Processor via the 3340 Direct Attach feature (#7851) ... see appropriate machines for additional requirements (Speclys, Special Features, Etc.). Limitations: Cannot be installed with either the 2311 md1 1/3340 Series Compatibility (#9060) or the 2314/3340 Series Compatibility (#9070) on S/370 mdls 115 and 126. Cannot be installed with Two Channel Switch, Add'l (#8171) on the 3830 md1 2. Field Installation: Yes.

REMOTE SWITCH ATTACHMENT (#8148). [Model A2 only] To attach the String Switch (#8150) to the configuration control panel of a S/370 md1 158 MP or 168 MP. Field Installation: Yes.

ROTATIONAL POSITION SENSING (#8201, 6202). Permits channel disconnect during most of the rotational latency period and thus contributes to increased channel availability. #6201 — for md1 B1 ... #6202 — for md1 A2 or B2. If installed, it is desirable for efficient operation to have on every 3340 md1 A2, B2 or B1 in a string. Limitations: The feature may be installed but is not supported by the 4331 Processor 3340 Direct Attach feature (#7851). Field Installation: Yes. Prerequisites: A block multiplexer channel on the system.

STRING SWITCH (#8150). [Model A2 only] To Attach the 3340 to a second attachment. The two attachments may be on the same CPU or different CPUs and may be any two of the following: 3830 Storage Control md1 2, 3880 Storage Control, the 3340 Direct Disk Attachment (DDA) on the 3115-2 or 3125-2, the 3330/3340 Series IFA (#4655) on the S/370 md1 135, 135-3, 138, the 3348 Storage and Control Frame md1 3, 4 or 5 or the ISC (#4860) for

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3340 Direct Access Storage Facility (cont'd)

attaching to S/370 mdl 145, 145-3, 148, and the S/370 mdl 158 and 168 ISCs (#4850) ... see appropriate machines for additional requirements. Switching between the two attachments is under program control. The 3340 may also be dedicated to a single attachment with an enable/disable switch. Field Installation: Specify: To indicate the attachment to which this feature will be made, specify one of the following:

- 3830 mdl 2 #9591 3148 ISC #9092
- 3135, 3135-3 IFA #9592 3158 ISC #9594
- 3135 IFA #9593 3158 ISC #9595
- 3345 mdl 3, 3, 4, #9593 3112-2 DDA #9596
- 3145, 3145-3 ISC #9593 3125-2 DDA #9597
- 380 #9701

In addition, String Switch (#9570) must be ordered on each 3340 mdl B1 or B2 which will be attached to the 3340 mdl A2 with String Switch (#8150).

ETP/ MAC/ MLC
Special Feature Prices: MRC 2 yr Purchase MMC
Fixed Head Feature
for model A2 and B2 #4301 $ 48 $ 41 $1,710 $1.50
for model B1 4302 24 20 855 1.00
Remote Switch Attach 6148 NC NC NC NC
Rotational Position Sensing
for mdl B1 8201 20 17 684 .50
for mdl A2 or B2 8202 25 21 684 .50
String Switch 8150 220 187 7,200 12.00

IBM 3344 direct access storage

Purpose: Dual drive, large capacity, direct access storage for attachment via a 3340 mdl A2 to any virtual storage S/370 Processor, available on the 4341 Processor.

For possible use with System/3, see GSD manual.

Model B2 Two-drive disk storage unit which attaches to a 3340 mdl A2. It may be intermixed with 3340 model B units and/or 3344 mdl B2F units in any combination up to three B units per 3340 mdl A2.

Model B2F Two-drive disk storage unit with the same attachment capabilities as the 3344 mdl B2. It features Fixed Heads which provide 1,004,160 bytes of zero seek time storage on each drive.

Highlights: The 3344 features a large capacity, fixed storage medium. Each drive is equivalent in capacity and format to four logical 3348 mdl 70s. Each 3344 has two drives and requires eight logical device addresses. The Fixed Head storage capacity on the 3344 mdl B2F is associated with the first of the four logical volumes on each drive.

Cylinder concept — each drive has 2,784 logical cylinders with 12 tracks per cylinder. Maximum track capacity is 8,368 bytes providing up to 100,416 bytes per logical cylinder.

The 3344 mdl B2 provides 279,558,144 bytes of storage per drive.

The 3344 mdl B2F provides 279,558,144 bytes of storage per drive of which 1,004,160 bytes are accessible by fixed heads.

Data Rate — 685,000 bytes per second.

Access Time: Average seek time is 25 ms with a minimum of 10 ms and a maximum of 50 ms. For the 3344 mdl B2F logical cylinder 1 thru 10 of the first logical volume on each drive have a seek time of zero ms while all other cylinders retain the above seek timing. Rotation time is 20.2 ms and latency is 10.1 ms.

Read Only — a two position switch is provided for each drive. When the switch is in the "read only" position, the drive is protected from being written upon or erased.

Rotational Position Sensing — a standard feature on the 3344 which permits channel disconnect during most of the rotational latency period and thus contributes to increased channel availability. Requires a block multiplexer channel on the system. If RPS is used, it is advisable for efficient operation to also have it on every 3340 in a string.

Data Recovery (Plant Only) — should data in the field prove unrecoverable, data recovery assistance at the plant of manufacture will be provided.

Alternate Tracks: There are 96 alternate tracks per drive. The 3344 will be shipped from the plant with not more than five flagged tracks per drive. Therefore, a minimum of 91 alternate tracks per drive are available for customer use.

PREREQUISITES: A 3344 requires a 3340 mdl A2 and any virtual storage 5/370 or 4341 Processor. with appropriate attachment and features. Control Store Extension (#2150) and Register Expansion (#1111) are prerequisite features on the 3830 mdl 2 and 3145, 3345, 3158, 3168 ISCs to attach 3344. On the 3115-2 and the 3125-2, 4K DASF Control Storage Extension (#4210) is required.

IMPORTANT: See the appropriate DASD storage control feature or machine to determine any additional prerequisite specify and/or special features to attach 3344.

Limitations: A 3340 string containing the 3344 may not be intermixed with a 3330 string on a 3135, 3135-3, 3136 IFA. 3340 strings containing the 3344 cannot be intermixed with 3330 or 3350 strings on a 3145, 3145-3, 3148, 3345, 3158, 3168 ISC or 3830 mdl 2.

Data written by S/3 cannot be retrieved by S/370 or 4341 Processor and vice versa.

Maximum: One 3340 string on a 3115-2/3125-2 DDA or on a 3135, 3135-3, 3138 IFA may contain 3344s.

Up to two 3340 strings on a 3830 mdl 2, 3145, 3145-3, 3148 or 3344 ISC, on each path of a 3158 or 3168 ISC or 3880 may contain 3344s.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with that of the unit to which the 3344 is attached.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] System Attachment: One of the following must be specified on each 3344 mdl B2/B2F: (For System/3 Specify Codes, see GSD manual.)

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<tr>
<th>ATTACHMENT</th>
<th>SPECIFY</th>
<th>ATTACHMENT</th>
<th>SPECIFY</th>
</tr>
</thead>
<tbody>
<tr>
<td>3345 mdl 2</td>
<td>#9591</td>
<td>3345 mdl 2</td>
<td>#9591</td>
</tr>
<tr>
<td>3345 mdl 3</td>
<td>#9592</td>
<td>3345 mdl 6</td>
<td>#9592</td>
</tr>
<tr>
<td>3345 mdl 3, 3, 4, 5</td>
<td>#9593</td>
<td>3345 mdl 6, ISG</td>
<td>#9593</td>
</tr>
<tr>
<td>3345 mdl 7, ISG</td>
<td>#9594</td>
<td>3345 mdl 10, ISG</td>
<td>#9594</td>
</tr>
<tr>
<td>3345 mdl 10, ISG</td>
<td>#9595</td>
<td>3345 mdl 15, ISG</td>
<td>#9595</td>
</tr>
</tbody>
</table>

ELECTRONIC DATA PROCESSING CONTINUOUSLY FROM 1979

PRICES: Mdl B2 B2F

<table>
<thead>
<tr>
<th>MRC 2 yr</th>
<th>Purchase MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3344 B2</td>
<td>$1,014+</td>
</tr>
<tr>
<td>3344 B2F</td>
<td>$1,357+</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B Warranty: B Machine Group: A
Purchase Option: 60% Useful Life Category: 2 Per Cal: 3
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model B2 to Model B2F ...... $1,610*

* Customer price quotations and customer acknowledgement letters for purchase MESs must state: "Installation of this model change involves removal of parts which become the property of IBM."

+ MAC/MRC, ETP/MLC and MMC for effective 6/1/79.

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### 3345 Model 3, 4 or 5 With One Channel or With Two Channel Switch (#8100)

<table>
<thead>
<tr>
<th>DASD Configuration</th>
<th>Required DASD Specify Features</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3137</td>
</tr>
<tr>
<td>DASD Only</td>
<td></td>
</tr>
<tr>
<td>Up to four 3333 with associated 3333s</td>
<td></td>
</tr>
<tr>
<td>String Switch (B1510) on any 3333</td>
<td></td>
</tr>
<tr>
<td>Up to four 3340 only</td>
<td></td>
</tr>
<tr>
<td>Fixed Head Feature</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>3140 Only</td>
<td></td>
</tr>
<tr>
<td>Up to four 3340 only</td>
<td></td>
</tr>
<tr>
<td>String Switch (B1510) on any 3340</td>
<td></td>
</tr>
<tr>
<td>Up to four 3350 only</td>
<td></td>
</tr>
<tr>
<td>Fixed Head Feature</td>
<td></td>
</tr>
</tbody>
</table>

---

**Notes:**
- ISC diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on same diskette.
- Any change to an installed DASD Configuration requires an MES ONLY if the new configuration indicates that a different specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.
- Control Store Extension (#2150) is prerequisite. With #9315, the ISC of the 3345 requires 32 contiguous device addresses regardless of the number of drives attached.
- Control Store Extension (#2150) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 64 contiguous device addresses irrespective of the number of drives attached. The 3340 mdls A2s on the first and third strings may attach up to three 3340 mdls B1, B2s, and/or 3346 in any combination. The 3340 mdls A2 on the second string may attach up to three 3340 mdls B1/B2s. The 3340 mdls A2 on the fourth string may attach one 3340 mdls B1 or B2.
- Expanded Control Store (#2152) and Register Expansion (#6111) are prerequisites. For configurations in this group the ISC uses 16 or 32 or 64 device addresses depending upon the DASD configuration installed and whether any 3350 drive is in 3300-1 compatibility mode.
- Note: Customers who may elect to purchase Control Store Extension (#2150) and later upgrade to Expanded Control Store (#2152) should consider the purchase of Expanded Control Store (#2152) initially because this field upgrade requires replacement of Control Store Extension (#2150) and installation of Expanded Control Store (#2152). The prerequisite of Control Store Extension (#2150) can be satisfied by Expanded Control Store (#2152).

### Prices:

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3345</td>
<td>1</td>
<td>$3,285</td>
<td>$104,950</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>6,015</td>
<td>189,850</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1,095</td>
<td>42,530</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>4,218</td>
<td>145,100</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>6,955</td>
<td>227,800</td>
</tr>
</tbody>
</table>

Plan Offering: Plan A, Additional Use Charge Rate: 10% Warranty: A Purchase Option: 50% Maintenance: D Metering: Base Unit (meter on 3145) Per Call: 3 Useful Life Category: 2

* MAC/MRC price effective June 1, 1979.

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The read/write heads and the access arms. The access arms and heads are not part of the drive as in previous disk pack/disk drive interfaces. The sealed module design protects the disk surfaces by reducing outside contamination. Multiple capacity options on each drive become possible due to the modularity provided by this unique design. In addition, the mdl 70F contains fixed heads which provide low cost, fixed head capability for the 3340 user. The user may place selected components of IBM software as well as his own programs in the fixed head area to increase device performance. The 3348 mdl 70F requires that the Fixed Head Feature be installed on the 3340.

Removable — can be installed and removed from the 3340 by the operator.

Interchangeable — the mdl 35 or the mdl 70 may operate on any drive and are interchangeable between drives, including those with the Fixed Head Feature installed. The mdl 70F, however, requires that #8411 or #8412 be installed on the drive.

Auto-loading — Data Modules are automatically loaded after the Data Module is placed in the drive, cover is closed and a switch is turned on. Start-up time is less than 20 seconds.

Flag-Free — Data Modules are shipped from the plant flag-free. If within 90 days after receipt the customer is required to assign an alternate track (using DOS/VS System utilities), he may return the Data Module to IBM and it will be repaired at no cost to the customer.

Capacity Upgrade — (Plant only) — the customer-owned model 35 may be capacity upgraded to a model 70. Data modules must be returned to the plant of manufacture for the upgrade service. Downgrading is not available. Recorded data will not be recoverable. Upgrade of either the model 35 or 70 to the model 70F is not available.

Dimensions

<table>
<thead>
<tr>
<th>Model 35</th>
<th>Model 70</th>
<th>Model 70F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>8&quot;</td>
<td>8&quot;</td>
</tr>
<tr>
<td>Width</td>
<td>16&quot;</td>
<td>16&quot;</td>
</tr>
<tr>
<td>Maximum Length</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

Shipping Weight (lbs) 21 23 24

Covers are sealed at the plant and are unbreakable and nonflammable. A large handle is provided for ease of installation, removal and transportation. The Data Module has an aperture that is opened (or closed) automatically by the drive during loading (or unloading). The Data Module is then connected to the drive for power and communications.

A CE cylinder is assigned to facilitate maintenance of the 3340.

Data Recovery (Plant only) — should data in the field, for any reason, prove unrecoverable, a method for data recovery assistance at the plant of manufacture will be provided.

Initialization — the Data Module will be initialized at the plant. Home addresses and record zero will be written for each track.

UPGRADE PRICE FOR PURCHASED DATA MODULES (Plant only)

Model 35 to model 70 .... **

3348 Data Module Repair Service (Plant only)

Mdl 35 Mdl 70 Mdl 70F

Replace one or more damaged disks (including servo disk) and heads, clean and lubricate, and retest to new data module performance specifications. (Does not include covers.)

Replace one or more damaged heads (including fixed head assembly on the 70F), clean and lubricate, and retest to new data module performance specifications.

Clean and lubricate and retest only. (This price will be charged if no disk heads require replacement.)

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IBM 3350 DIRECT ACCESS STORAGE

Purpose: High speed, large capacity, direct access storage for attachment to any virtual storage S/370 Processor (except 3115 or 3125), or a 4341 Processor.

Model A2 Two-drive disk storage and associated control for attachment to 3145 mdls GE, GF, H, HG or I via the 3345 mdls M 3, 4 or 5, to the 3145 mdls H2, H2, J2, J2 or K2 via the ISC (#4660), to the 3145-B, and the 3148 via the ISC (#4660), to the 3158, 3158-B, 3168 or 3168-B via the ISC (#4650), to the 3380 mdls 2 or 3, and the 3880. It provides power and control for the attachment of up to three 3350 mdls B2/B2F units or up to two mdl B2/B2F units and one C2/C2F unit.

Model A2F Two-drive disk storage and associated control with the same attachment capabilities as the model A2. It features Fixed Heads which provide up to 1,144,140 bytes of zero seek time storage on each drive in lieu of the same capacity under the moving heads.

Model B2 Two-drive disk storage unit. Up to three 3350 mdls B2/B2F are and or two B2/B2F units. Model B2 requires the following:

- Prerequisites: A 3350 DAS requires a 3350 mdl A2 or A2F. Any virtual storage S/370 Processor with appropriate attachment and features (except 3115 or 3125), or a 4341 Processor via a 3830 Storage Control mdl 2 or 3, or a 3880 Storage Control. B2A requires Word Buffer (#5805) to attach 3350s. Expanded Control Store (#2151). Control Store Expansion (#2150), and Register Expansion (#6111) are required on the 3830 mdl 2 or 3158, 3168 ISCs to attach 3350s. Expanded Control Store (#2152) and Register Expansion (#6111) are required on the 3145, 3145-B, 3148 or 3345 ISCs, or 3830 mdl 3 to attach 3350s.

Model B2F Two-drive disk storage unit with the same attachment capabilities as the model B2. It features Fixed Heads which provide up to 1,144,140 bytes of zero seek time storage in each drive in lieu of the same capacity under the moving heads.

Model C2 Two-drive disk storage and associated control. Provides an alternate controller function within a 3350 string. The model C2 functions as a mdl A2 or B2 depending upon the setting of a manual switch on the unit. A 3350 string containing a model C unit requires a model A unit with Primary Controller Adapter (#1300) and may include 0, 1 or 2 model B2/B2F units.

Model C2F Two-drive disk storage and associated control with the same attachment capabilities as the model C2. It features Fixed Heads which provide up to 1,144,140 bytes of zero seek time storage in each drive in lieu of the same capacity under the moving heads.

Highlights: The 3350 features high data rate, fast access, multiple formats and low cost per byte. It employs a fixed storage medium.

Selective Format: Drive format may be 3330 mdl 1 or 3330 mdl 11 compatibility mode or 3350 native mode. Format is specified by individual drive. Format changes may be made by FE in the field. In 3330 mdl 1 or mdl 11 compatibility mode the Fixed Head storage capacity on the models A2, B2F and C2F is 742,710 bytes per drive. In 3330 mdl 1 compatibility mode this Fixed Head storage capacity is associated with the first of the two logical 3330 mdls 1 volumes on each 3350 drive. In 3350 native mode Fixed Head storage capacity on the models A2, B2F and C2F is 1,144,140 bytes per drive.

Cylinder Concept:

- Cylinder Mode: 3330 mdl 1 3330 mdl 11
- Cylinder Mode: 3350 Native

Model	3330 mdl 1 3330 mdl 11 3350
Mode	Mode	Mode
Bytes per Track	13,030	13,030	19,069
Tracks per Logical Cylinder	19	19	30
Logical Cylinders per Drive 2 x 404	808	585
Approx capacity/drive (MB) 2 x 100	200	317.5

Data Rate: 1,198,000 bytes per second.

Access Time: Average seek time is 25 ms with a minimum of 10 ms and a maximum of 50 ms. Average rotational delay is 8.4 ms. For 3350 mdls A2F, B2F C2F cylinders 1 and 2 (3350 Native Mode), or cylinders 1 thru 3 (3330 mdl 11 compatibility mode), or cylinders 1 thru 3 of the first of the two logical volumes on a drive (3330 mdl 1 compatibility mode), have a seek time of zero ms. All other cylinders retain the above seek timing.

Error Correction: Enables the controller to correct from certain subsystem errors without recourse to system error recovery procedures.

Write Format: Frees the subsystem while the drive erases from the end of a formatted write record to the end of the track.

Rotational Position Sensing: Permits channel disconnect during period of rotational latency, thereby providing greater channel availability... requires one unshared subchannel on a block multiplexer channel for each logical device.

Command Retry: Enables the storage control to recover from certain subsystem errors without resort to system error recovery procedures.

Read Only: A two position switch is provided for each drive. When the switch is in the "read only" position, the drive is protected from being written upon or erased.

Data Recovery (Plant Only): Should data in the field prove unrecoverable, data recovery assistance at the plant of manufacture will be provided.

Flag Free: The 3350 will be shipped flag free.

PREREQUISITES: A 3350 DAS requires a 3350 mdl A2 or A2F; any virtual storage S/370 Processor with appropriate attachment and features (except 3115 or 3125), or a 4341 Processor via a 3830 Storage Control mdl 2 or 3, or a 3880 Storage Control. A 3145 requires Word Buffer (#5810) to attach 3350s. Expanded Control Store (#2151). Control Store Expansion (#2150), and Register Expansion (#6111) are required on the 3830 mdl 2 or 3158, 3168 ISCs to attach 3350s. Expanded Control Store (#2152) and Register Expansion (#6111) are required on the 3145, 3145-B, 3148 or 3345 ISCs, or 3830 mdl 3 to attach 3350s.

IMPORTANT: See the appropriate DASD storage control feature or machine to determine any additional prerequisite specify and/or special features to attach a 3350.

Maximum: See 3145, 3158, 3168, 3345 ISC, 3830 mdl 2 or 3, or 3880 "Machines" pages.

Bibliography:

**SPECIFY:** [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): 99003 for 208 V, or 99005 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

**FORMAT:**

- First Drive
  - Drive 3330 mdl 1 Compatibility Mode #9731
  - Drive 3330 mdl 11 Compatibility Mode #9732
  - Drive 3330 Native Mode #9733

- Second Drive
  - Drive 3330 mdl 1 Compatibility Mode #9731
  - Drive 3330 mdl 11 Compatibility Mode #9732
  - Drive 3330 Native Mode #9733

**MACHINES:**

- Plan Offering: Plan B Purchase Option: 60% Machine Group: A Warranty: B Useful Life Category: 2 Per Call: 3 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

**PRICES:**

- Mdl
  - 3350
    - A2 $1,304 $1,100 $40,000 $170
    - A2F $1,307 $1,355 $49,920 $221
    - B2 $1,034 $880 $31,680 $128
    - B2F $1,157 $1,155 $41,600 $179
    - C2 $1,151 $1,150 $41,180 $179
    - C2F $1,074 $1,425 $51,300 $230

**ETP/ MRC:**

- 2 yr t Purchase
  - MMLC

**MODEL UPGRADE PURCHASE PRICES:**

- Model A2 to Model A2F .... $12,610*
- Model A2F to Model B2F .... $12,610*
- Model C2 to Model C2F .... $12,610*

* Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this model change is involved the removal of parts which become the property of IBM."

† MAC/MRC, ETP/MLC and MMMC prices effective 6/1/79.

REMOTE SWITCH ATTACHMENT (#6148). [Mdlis A2, A2F, C2 and C2F only] To attach the String Switch (#8150) to the configuration control panel of a S/370 mdl 158MP or 168MP. Field Installation: Yes.

STRING SWITCH (#8150). [Mdlis A2, A2F, C2 and C2F only] To link the 3350 to a second attachment. The two attachments may be on the same CPU or different CPUs and may be any two of the following: 3830 Storage Control mdl 2 or 3, 3830 Storage Control, the 3345 Storage and Control Frame mdl 3, 4 or 5, the ISC (#4660) on the S/370 mdl 145, 145-3 or 148, or the ISC (#4650) on the S/370 mdl 158, 158-3, 168 or 168-3. See appropriate machines for additional requirements. Switching between the two attachments is under program control. The 3350 may also be dedicated to a single attachment with an enable/disable switch. Specify: #9608 for attachment to a 3880, or #9609 for attachment to any of the following; 3345 mdl 3, 4 or 5, the ISC (#4660) on a S/370 mdl 145, 143-3 or 148, the ISC (#4650) on a S/370 mdl 158, 158-3, 168, 168-3, or a 3830 mdl 2 or 3. Field Installation: Yes.

SPECIAL FEATURES

Feature Prices:

PREREQUISITE: An appropriate 3155 or 3165. When ordering 3360s to change the size of a S/370 mdl 155 or 165, a companion order modifying the model of the 3155 or 3165 must also be submitted.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

PRICES: Mdl | MAC/ MRC | Purchase | MMMMC
---|---|---|---
3360 | $3,060 | $19,300 | $187
        | 2 | 4,590 | 209,000 | 279
        | 3 | 6,120 | 279,700 | 372
        | 4 | 3,060 | 139,200 | 187
        | 5 | 6,120 | 279,700 | 372

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Purchase Option: 65%
Machine Group: D
Metering: Mdlis 1, 2, 3 - Base Unit (meter on 3155) Per Call: 3 Mdlis 4, 5 - Assignable Unit
Warranty: A Useful Life Category: 1
IBM 3370 Direct Access Storage

Purpose: High speed, large capacity, fixed media, direct access storage for attachment to a 4331 or 4341 Processor.

Model A: Single drive disk storage with two actuators and associated control for attachment to a 4331 or 4341 Processor. It provides logic for the attachment of up to three 3370 model B1s.

Model B: Single drive disk storage with two actuators. Up to three 3370 model B1s can be attached to a 3370 model A1.

Model Changes: Available at time of manufacture only.

Highlights

The 3370 features a high data rate, fast access, fixed block format, and low cost per byte. It employs a fixed, sealed Head/Disk Assembly (HDA) as the storage medium. The HDA is a field replaceable unit. Two access arms per spindle, each separately addressable with overlapped operation ... locate/locate/read/write. Each arm accesses one-half the data. Reduced power and space requirements. Fixed block architecture allows the specification of DASD space in groups of blocks, making space definition independent of tracks and cylinders.

Fixed Block Format

<table>
<thead>
<tr>
<th>Bytes per block</th>
<th>Blocks per actuator</th>
<th>Bytes per actuator (megabytes)</th>
<th>Bytes per spindle (megabytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>512</td>
<td>558,000</td>
<td>285.6</td>
<td>571.3</td>
</tr>
</tbody>
</table>

Blocks are separately addressable and jointly form a contiguous address space.

Data Rate: 1.859 ± 3% megabytes per second.

Access Time

Seek (Arm Motion)

- Minimum: 5 ms
- Average: 20 ms
- Maximum: 40 ms

Latency: 10.1 ms

Error Correction: Provides the capability of correcting single data error bursts of up to nine bits span as well as detecting all single error bursts of up to sixteen bits span.

Automatic Position Sensing: Fixed Block Architecture provides for relative block addressing ... each block separately addressa-

ble ... channel automatic disconnect during period of rotational latency providing greater channel availability ... requires one

unshared subchannel on a block multiplexer channel for each logical address.

Command Retry: Enables the storage control to recover from certain subsystem errors without recourse to system error recovery procedures.

Write Protect Function: A switch for each Drive Address provides the means to protect data from being rewritten or erased. When the read/write switch is in the read-only position, any write command is rejected. The switch state can be changed only when the device is not selected.

HDA Data Recovery: [Plant only] Should data in the field prove unrecoverable, data recovery assistance at the plant of manufacture will be provided.

Prerequisites

For a 4331 Processor -- a 3370 model A1 requires a DASD Adapter (#3201) on the 4331.
For a 4341 Processor -- a 3370 model A1 requires a 3880 Storage Control mdl 1 connected to a 2.0 megabyte block multiplexer channel on the 4341.
A 3370 model B1 requires a 3370 model A1.

Electric power is required during non-operating periods except when maintenance is being performed. Each 3370 contains internal environmental control circuitry which remains active when machine power is turned off. Continued or repeated failure to provide power to this circuitry could cause machine malfunction and could result in possible loss of data.

Maximum: See 3880 Storage Control or 4331 Processor.

Bibliography: GA26-1657

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**Magnetic Tape Unit and Control**

**3411 MAGNETIC TAPE UNIT**

**Purpose:** Magnetic tape units and controls for a 3790 Communication System, 8/360 models 115 thru 155, a 3031 Processor, or a 4331 or 4341 Processor. The 3410 model 1 can be used with a 3881 Optical Mark Reader model 2 or a 3886 Optical Character Reader model 2. The 3411 and 3410 model 3 can be used with a 3800 Printing Subsystem. The 3411 model 1 can be used with a 3776 Communication Terminal model 3 or a 3777 Communication Terminal model 3.

**NOTE:** For possible use with System/3, see GSD Manual.

**Models:** Data rates in 8-bit bytes per second (1600 bpi).

- **3410**
  - Model 1: 20,000
  - Model 2: 40,000
  - Model 3: 80,000

- **3411**
  - Model 1: 20,000
  - Model 2: 40,000
  - Model 3: 80,000

**Highlights:** The 3410 is a single tape unit controlled by a 3411. The 3411 is a single channel control unit with one tape drive.

- Efficient compact space saving design.
- Dual Density feature allows processing of data recorded in 6400 bpi PE or 8000 bpi NRZI.
- Seven Track feature: tape written in seven-track format; compatibility with tapes written at 200, 556, 800 bpi by 729/7325/7326 and 2404/2415/2416/2417/2418 tape drives equipped with 7-track read/write heads. Note: 7-track tapes cannot be used with a 3776 model 3 or a 3777 model 3.
- Radial attachment of tape units permits off-line maintenance.
- Simplified tape threading path.

**Checking** -- during write operations, both parity and signal amplitude are checked. (When used with a 3881 Optical Mark Reader, both are checked in 800 bpi NRZI signal amplitudes only in 1600 bpi.) During read operations, parity is checked.

**Error Correction** -- in 1600 bpi PE recording format single track error correction in flight takes place. For 9-track, 800 bpi NRZI, track in error (T.I.E.) is provided, (not applicable when used with a 3881 Optical Mark Reader).

**Functions:** The following table indicates feature numbers for corresponding functions:

<table>
<thead>
<tr>
<th>Subsystem Function</th>
<th>Feature Name</th>
<th>3411 Control Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600 bpi 9-track only</td>
<td>Single Density Standard</td>
<td>#3211</td>
</tr>
<tr>
<td>1600 bpi PE/800 bpi NRZ1 9-track</td>
<td>Dual Density</td>
<td>#9150</td>
</tr>
<tr>
<td>1600 bpi PE/200-556-800 bpi NRZ1 7-track</td>
<td>Seven Track</td>
<td>#9160</td>
</tr>
</tbody>
</table>

* Tape units must all be the same model as 3411.

**Characteristics**

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Rate (kb/sec)</td>
<td>at 1600 bpi (P.E.)</td>
<td>20</td>
</tr>
<tr>
<td>at 800 bpi (NRZI)</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>at 556 bpi</td>
<td>6.9</td>
<td>13.9</td>
</tr>
<tr>
<td>at 200 bpi</td>
<td>2.5</td>
<td>5.0</td>
</tr>
<tr>
<td>Recording Density (bpi)</td>
<td>1600/800/556/200 (all models)</td>
<td>Tape Speed (fps)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Track</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Track</td>
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<tr>
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<td>Track</td>
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<td>Track</td>
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<tr>
<td></td>
<td></td>
<td>Track</td>
</tr>
</tbody>
</table>

**Maximums:** Interconnected 3410s and 3411s must be of the same model. Models cannot be intermixed. The maximum number of tape units (3410s) per 3411 are:

- **Model 1** — up to three 3410 model 1s ... a total of 4 drives.
- **Model 2** — up to five 3410 model 2s ... a total of 6 drives.
- **Model 3** — up to five 3410 model 3s ... a total of 6 drives.

**LIMITATION:** A maximum of one 3410 model 1 can be attached to a 3881 or 3886.

**REQUISITES:** Each 3411 requires the following:

- For S/370 model 115, 125 — a 3411 Magnetic Tape Adapter (*#4675*) on the 3115 or 3125 and S/370 model 115/125 Attachment (*#7381*) on the 3411 except with 3115 model HG2, 3125 model HG2 and HG2. When attached to 3115 model HG2, or 3125 model HG2

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3410/3411 Magnetic Tape Unit and Control (cont'd)

Additional Tape Units (3411 only): #9001 ... required if the number of tape drives is to exceed four (one 3411 plus three 3410s). Installation: Yes.

Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

Tape Reels: If any color other than gray is desired, specify #9051 for red, #9053 for blue, or #9054 for white.

Density Formats: The 3410/3411 subsystem can operate in three density formats: 1600 bpi PE, single density or 1600/800 bpi, dual density ... subtraction of single density, which is standard on the control unit of the 3411, a feature number for the format desired must be specified for each tape unit and the control unit ... Special Features" for limitations. Dual Density. Control (#9161) is required on the 3411 for Dual Density. Tape Unit (#3221) on the 3411 and attached 3410s ... see [specific] 2 above. Seven Track, Control (#9160) is required on the 3411 for Seven Track Tape Unit (#5930) on the 3411 and attached 3410s ... see [specific] 3 above.

System Attachments: S/370 Mdl 115/125 Attachment (#7361) is required for attachment to a S/370 mdl 115 or 125 except with 3151 mdl H2G and I2. Plan Offering: Plan A, Additional Use Charge Rate: 10% Purchase Option: 55% Maintenance: C Memory: 3410 (all mlds - I/O Unit Online) ... 3411 - Assignable Unit Warranty: B. Useful Life Category: 2. Per Call: 3 Model/Feature Additional Charge in bpi: 10% Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICES (There are no additional installation charges)

<table>
<thead>
<tr>
<th>3410 Mdl 1 to Mdl 2</th>
<th>$2,385</th>
<th>3411 Mdl 1 to Mdl 2</th>
<th>$4,140</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mdl 2 to Mdl 1</td>
<td></td>
<td>Mdl 3 to Mdl 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,635</td>
<td>3,840</td>
<td></td>
</tr>
</tbody>
</table>

SPECIAL FEATURES

SINGLE DENSITY, TAPE UNIT (#3211). 
Permits the 3410 or the tape unit on the 3411 to operate at 200 bpi PE only. Limitations: Cannot be installed with Dual Density. Tape Unit (#3221) or Seven Track, Tape Unit (#6550). Field Installation: Yes. Prerequisites: If installed on the 3886 Optical Character Reader, Single Density Tape Adapter (#6490) on the 3886.

DUAL DENSITY, TAPE UNIT (#3221). 
Permits the 3410 or the tape unit on the 3411 to operate at 500 bpi as well as 200 bpi PE. Limitations: Cannot be installed with Single Density, Tape Unit (#3221) or Seven Track, Tape Unit (#6550). Field Installation: Yes. Prerequisites: Dual Density, Control (#9161) on the 3411. See [specific] 9 Density (D3500) on the 3886 Optical Mark Reader, or Dual Density, Tape Adapter (#6485) on the 3886 Optical Character Reader.

SEVEN TRACK, TAPE UNIT (#6550). 
Permits the 3410 or the tape unit on the 3411 to operate at 200, 556 or 800 bpi NRZI in the seventeen-track format compatible with 729, 7330, 7335 and 2401, 2402, 2403, 2404, 2415, 3420 tape units equipped with seven-track read/write heads. Tape units with this feature will only read or write 7-track tape. Limitations: Cannot be installed with Single Density, Tape Unit (#3221), or Dual Density, Tape Unit (#3221). Cannot be used with a 3776 mdl 3 or 4, or a 3777 mdl 3. Field Installation: Yes. Prerequisite: Seven Track, Control (#9160) on the 3411.

SYSTEM/3-3770/3790 COMMUNICATION SYSTEM ATTACHMENT (#7800). [3411 mdl 1 only] To attach a 3411 mdl 1 to a 3776 Communication Terminal mdl 3 or 4, or a 3777 Communication Terminal mdl 3. Prerequisites: Magnetic Tape Attachment (#7804) on the 3776, or Magnetic Tape Unit and Control Mdl 1 Attachment (#7801) on the 3776 mdl 3 or 4, or mdl 3. Maximum: 1. Field Installation. Yes. Limitations: Cannot be installed with S/360/370 Attachment (#7360), or S/370 Mdl 115/125 Attachment (#7361). For use with System 3, see GSD sales manual.

S/360/370 ATTACHMENT (#7360). [3411 mdl 1, 2, 3] To attach the 3411 to a S/360 mdl 22, 26, 30, 40, 50, or a S/370 mdl 135, 136-3, 138, 145, 145-3, 148, 155, 158, a 3031 Processor, or any 430 Processor. [3411 mdl 3] To attach the 3411 mdl 3 to a 3800 Printing Subsystem. Up to eight control units may be attached to the 3800 provided that power sequencing and control connection for all other than one are provided by the system. Limitations: Cannot be installed with System/3-3790 Communication System Attachment (#7360) or S/370 Mdl 115/125 Attachment (#7361) or RPQ. Field Installation: Yes.

Model 3: 120,000 eight-bit/second ... with an 8000 Printing Subsystem. 
Model 5: 200,000 eight-bit/second ... with an 8000 Printing Subsystem. 
Model 7: 320,000 eight-bit/second ... with an 8000 Printing Subsystem. 

Highlights: Radial attachment of tape drives to the control unit via a pitch located in the control unit, permitting off-line service of individual tape units without disturbing the subsystem. 24-line multiplex interface provides advanced diagnostic capability. MyClass circuitry reduces card count while increasing functions: expanded sense data, better diagnostic capability, unique device identification, EC level and feature identification. Reads and writes IBM Series/500, Dynexcels or Heavy Duty half-inch magnetic tape on 10-1/2", 8-1/2"; or minireels. Limitations: The following half-inch tapes can be used: IBM Heavy Duty, IBM Dynexcel, IBM Series/600, or competitive formulations which meet the specifications described in SRL GA32-0008. IBM Mylar** and IBM Acetate tapes should not be used with 3420 tape units.

FPT is 12-23 months.

** "Mylar" is a trademark of E. I. du Pont de Nemours & Co., Inc. "IBM Mylar" is a brand of magnetic tape which includes a Mylar polyester substrate and which was previously marketed by IBM.

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Automatic threading and Cartridge Loading -- threading is automatic with or without the wraparound cartridge; automatic retry (with cartridge only) in case of load failure, stopping on the leader to prevent damage to the recorded surface. With the wraparound cartridge, tape is not exposed to contamination or damage.

Nine Track 1600 bpi Phase Encoding Operation -- data is recorded parallel by bit, serial by byte at 1600 bytes/inch, phase encoded, in nine tracks across the width of the tape. The data format uses eight of the nine bits for data; the ninth bit is a parity bit. Data is recorded in odd parity. The eight bits of one byte can represent an alphabetic character, zoned decimal digit, two decimal digits (packed), a special character, or eight binary bits. The recording format is compatible with the 1600 bpi PE recording of tape units 2401, 2402, 2403, 2404, 2415 mdls 4, 5, and 6, and 2420 mdls 5 and 7. For nine track 1600 bpi PE operation only, specify Single Density (#6361) ... see "Special Features" for limitations and prerequisites.

Nine Track 800 bpi NRZI Operation -- tape is written at 800 bpi in the nine track NRZI format as well as in the 1600 bpi PE format. Data representation is the same as for 1600 bpi PE operation. For nine track 800 bpi NRZI capability, Dual Density (#3550) is required on the tape unit ... see "Special Features" for limitations and prerequisites.

Seven Track Operation -- tape is written in the seven track format compatible with tapes written at either 556 or 800 bps by 729/730/735 or 2401/2402/2403/2404/2415 tape drives equipped with seven-track read/write heads. For seven track operation, Seven Track (#6407) is required on the tape unit ... see "Special Features" for limitations and prerequisites.

Checking -- each byte is parity checked while tape is being read. Data written on tape is read back instantly and checked as in reading, with full parity check.

Error Correction -- single track drop-out errors are corrected 'in full' while reading during 1600 bpi read operation.

Read Backwards -- all tapes (9- or 7-track) written on a 2401/2402/2403/2404/2415/2420 can be read by the 3420 in a forward or backward direction. The Data Conversion function is inoperative during backward read of 7-track tapes.

Limitations:
Model 3 cannot be attached to the multiplexer channel of the S/360 mtl 22 or 30.
Model 5 cannot be attached to the multiplexer channel of the S/360 mtl 22, 30, 40, or 50. Model 5 at 1600 bpi PE cannot be attached to S/360 mtl 22. If the 3420 mtl 5 is ordered for attachment to a selector subchannel feature of the 2870, consult Model 7 cannot be attached to S/360 mtl 22, 30 or 40, S/370 mtl 115 or 125, nor to the 2870.
OS does not support burst mode devices on multiplexer channels on S/360 mdls 22, 30, 40 or 50, or on the basic 2870 multiplexer channel. Programming support for the extended diagnostic capabilities of the 3420 requires a minimum of 32K core.

Supplies -- one standard 10-1/2" reel of magnetic tape in an easyload cartridge is shipped with each tape unit. For additional reels of tape and cartridges, see IRD sales manual.

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### Purpose:
Magnetic Tape Unit for S/370.

**Model 4**
- 470,000 eight-bit bytes/second for use with any S/370 Processor (except 3115 or 3125), or a 3800 Printing Subsystem.

**Model 6**
- 780,000 eight-bit bytes/second for use with any S/370 Processor (except 3115 or 3125), or a 3800 Printing Subsystem.

**Model 8**
- 1,250,000 eight-bit bytes/second for use with any S/370 Processor (except 3115 or 3125), or a 3800 Printing Subsystem.

### Highlights:
- Nominal recording density of 6250 user bytes per inch with a 0.3 inch inter-block gap.

### Limitations:
- Pre-Requisite: (GA24-XXXX).
- Are not supported on byte multiplexer, multiplexer, or stand-alone emulators.

### Cleaning Mechanism:
Cleaning mechanism is a by-product of tape processing. The cleaning switch located in the control unit, permitting off-line service of the recording head. This new cleaning mechanism makes tape wraparound cartridge, tape is not exposed to contamination or damage.

### Automatic Read Amplification:
Automatically adjusts the amplifier gain in the tape drive to each individual reel of tape when operating at 6250 bpi.

### Checking:
Data written on tape is read back instantly to ensure later readability.

### Read Backward:
Tapes written at 6250 bpi mode can be read in a forward or backward direction. Tapes written at 1600 bpi (Phase Encoded) mode can be read in a forward or backward mode if the 3420 mdl 4, 6 or 8 is equipped with the 6250/1600 bpi optional feature... see "Special Features."

### S/360 Attachment:
One channel of 3420 mdl 4s may be attached via a 3803 mdl 2 to S/360 mdl 50 by no-charge RPQ. 3420 mdl 4, 6 or 8 may be attached via a 3803 mdl 2 to S/360 mdl 65 thru 195 (mdl 67 operating in 65 model) by no-charge RPQ. S/360 stand-alone emulators are not supported.

### Tape Media:
Most tape volumes which operate satisfactorily on RPQ.

### Prerequisite:
A 3803 Tape Control mdl 2.

### Limitations:
3420 mdl 4, 6 and 8 via a 3803 mdl 2 control unit are not supported on byte multiplexer, multiplexer, or 2870 Select Subchannel at either 6250 or 1600 bpi. 3420 mdl 6 or 8 cannot be attached to S/360 mdl 50. When contemplating the attachment of 3420 mdl 6 or 8 to S/370 mdl 135, 135-3, 145 or 145-3, consult System 370 Model 135 Channel Characteristics (GA33-3010), System 370 Model 138 Channel Characteristics (GA33-XXX), System 370 Model 145 Channel Characteristics (GA24-3573) or System 370 Model 148 Channel Characteristics (GA24-XXXX).

### Supplies:
One standard 10-1/2" reel of magnetic tape tested for 6250 bpi in an Easyload I cartridge is shipped with each tape unit. Additional reels of tape and cartridges.

### Model Characteristics:
<table>
<thead>
<tr>
<th>Model 4</th>
<th>Model 6</th>
<th>Model 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tape Speed (in/sec)</td>
<td>75</td>
<td>125</td>
</tr>
<tr>
<td>Recording Density</td>
<td>6250/1600</td>
<td>6250/1600</td>
</tr>
<tr>
<td>Nominal Data Rate (kb/sec)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 6250</td>
<td>470</td>
<td>780</td>
</tr>
<tr>
<td>at 1600</td>
<td>120</td>
<td>200</td>
</tr>
<tr>
<td>Nominal IBG (in)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 6250</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>at 1600</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Max Rewind/Read Access (ms)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>at 6250</td>
<td>2.3/2.1</td>
<td>1.6/1.5</td>
</tr>
<tr>
<td>at 1600</td>
<td>4.0/3.0</td>
<td>2.9/2.0</td>
</tr>
</tbody>
</table>

### Pricing:
<table>
<thead>
<tr>
<th>Model 4</th>
<th>Model 6</th>
<th>Model 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>$9,540</td>
<td>$13,230</td>
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<td>$9,540</td>
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<td>$12,780</td>
</tr>
<tr>
<td>$9,540</td>
<td>$12,780</td>
<td></td>
</tr>
</tbody>
</table>

### Special Features:
- **FTP**
- **ETP**
- **MAC/MLC**
- **MLC**

### Change:
- **6250 DENSITY (#6420)**
- **1600 DENSITY (#6425)**

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IBM 3501 CARD READER

Purpose: Punched card input unit for the 3770 Data Communication System, or 8100 Information System via 3289 Printer model 3.

Highlights: Used for automatic entry of punched card data. The 3289 Printer mdl 3 or 3770 System performs all format control and analysis.

Rated 80-column card speed is 50 cards per minute. Cards are read serially by a sensing mechanism which is checked for proper functioning in every card cycle. EBCDIC or ASCII (3770 System only) code can be read. Hopper and stacker capacity is approximately 400 cards.

The 3501 is packaged as a table-top device.

Card Limitations: Generally, special feature cards require careful handling and a favorable environment. Use of the following has been approved:


Corner Cuts — Any corner: C5. Upper right and upper left corners: C1, C2, C3.

Verified Cards — approved cards with verify notch between rows 0 and 1, column 80 edge; or verify punch 2 and 3 in column 81 area.

Card Stock — regular, edge coated, and heavy duty.

All other special feature cards may result in unsatisfactory performance.

PREREQUISITE: 3501 Card Reader Attachment (#8050) on the 3289-3, 3771, 3774, 3775 or 3776.

Limitation: Cannot be installed on a machine with a 2502 Card Reader.

Bibliography: GC20-0001


[2] Documentation: One must be specified. #9101 for use with a 3771, #9102 for use with a 3289-3, 3774 or 3775, or #9103 for use with a 3776.


| PRECISES: Mdl | MRC | MLC | 2 Yr | Purchase | MMC
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3501</td>
<td>114</td>
<td>97</td>
<td>$3,400</td>
<td>$17.00</td>
<td></td>
</tr>
</tbody>
</table>

Plan Offering: Plan B Purchase Option: 60% Maintenance: C Warranty: B Useful Life Category: 2 Per Call: 1 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

M 3501
May 79
IBM 3504 CARD READER

Purpose: Punched card input unit for a 5/370 model 125.

Model Rated 80-column Card Speed
A1 800/minute
A2 1200/minute

Highlights: The 3504 is a high-speed, fully buffered card reader that attaches natively to a CPU via an Integrated 3504 Card Reader Attachment on the 3125. The 3504 is a natively attachable version of the 3505 Card Reader.

Both models have a 3,000-card capacity file feed and two 1,750-card capacity, non-programmable stackers which operate in an alternating mode. Feeding from the hopper is by means of friction feed. Failure to feed a card from the hopper followed automatically by up to 3 retries before the machine stops.

Both models have read column eliminate capability which provides the user, under program control, the ability to suppress reading of selected card columns. It is recommended for use to prevent reading in columns that could cause validity and read checks due to invalid codes or open-punched card scores.

Holes in the card are read by an optical reader (#6555) be installed in an altitude exceeding 12,000 feet. Failure to feed a card after folding if the card is properly flattened.

Prerequisite: An Integrated 3504 Card Reader Attachment (#4680) on the 3125.

Card Limitations: Generally, special feature cards require careful handling and a favorable environment. Use of the following card features has been approved:

Internal Scores (before separation) — M-4, M-5, OM-2, OM-3, 1D-1, 1D-2, ID-3 and S-1 NOTE: When using OM-2 or OM-3, either reading must be terminated prior to the column that is scored, or, reading of the scored column and the two adjacent columns must be suppressed by means of program-controlled Read Column Eliminate. S-2 may be used prior to folding, and after folding if the card is properly flattened.

External Scores (after separation) — column 1 and 80 end: M-3, M-4, M-5, M-6, M-7, M-11, OM-2, CF-4 and CF-11. Column 1 end only: OM-3. 12 and 9 edge:

Port-A-Punch — can be processed.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Model</th>
<th>Price 80-column Card Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>$606</td>
</tr>
<tr>
<td>A2</td>
<td>$736</td>
</tr>
</tbody>
</table>

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model A1 to Model A2 $1,040

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Purpose: Punched card input for a S/360 mld 195 or all S/370 or 4300 Processors.

Model

B1  800/minute
B2  1200/minute

Highlights: The 3505 is a high-speed, fully buffered, card reader, containing its own control unit. With appropriate adapter and control features installed (see "Special Features"), the 3505 provides the power and logic to control one 3525 Card Punch.

All models have a 3,000-card capacity file feed and two 1,750-card capacity non-programmable stackers which operate in an alternating mode. Feeding from the file feed hopper is by means of friction feed rolls with vacuum assist. Failure to feed a card from the hopper is followed automatically by up to 3 retries before the machine stops.

All models have read column eliminate capability which provides the user, under program control, the ability to suppress the reading of selected card columns. It is recommended for use to prevent reading in columns that could cause validity and read checks due to invalid or open-punched card scores.

Holes in the card are read by a light sensing mechanism which is checked for correct operation in every card cycle. Cards punched in either the Extended BCD Interchange Code (Data Mode 1) or Card Image (Data Mode 2) can be read. Machine checks are made for valid invalid codes (Data Mode 1 punching only), off-punching, and mispositioned cards.

Maximum: S/360 mld 195 and all S/370 or 4300 Processors - the number of 3505 models B1 and/or B2 that can be attached depends upon the number of system channel control unit positions available.

PREREQUISITES: Each 3505 requires an available control unit position on a channel.

S/360 mld 195 and S/370 mld 195 -- selector channel of 2860, basic multiplexer channel of 2870, or block multiplexer channel of 2860 ... see 2860, 2870, 2880.

S/370 mld 115, 125 -- Byte Multiplexer Channel (special feature). See 3115, 3125.

S/370 mld 135 -- byte multiplexer channel (standard), Selector Channels (special features), Block Multiplexer Channels (special features) ... see 3135.

S/370 mld 135 - 3 - byte multiplexer channel (standard), Block Multiplexer Channels (special features) ... see 3135-3.

S/370 mld 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.

S/370 mld 145 -- byte multiplexer channel (standard), Selector Channels (first one is standard), Block Multiplexer Channels (special features) ... see 3145.

S/370 mld 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.

S/370 mld 148 -- byte multiplexer channel (standard), block multiplexer channel (standard) ... see 3148.

S/370 mld 155, 158 -- byte multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), Block Multiplexer Channels (first two are standard) ... see 3155, 3158.

S/370 mld 165, 168 -- selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannels (special features) or 2870, or block multiplexer channel of 2880 ... see 2860, 2870, 2880.

3031, 3032 Processor -- byte multiplexer channel (one is standard). Block multiplexer channels (five are standard) ... see 3031, 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.

4331 Processor -- byte multiplexer channel (special feature), block multiplexer channel (special feature) ... see 4331.

4341 Processor -- byte multiplexer channel (standard), block multiplexer channel (two are standard) ... see 4341.

Card Limitations: Generally, special feature cards require careful handling and a favorable environment. Use of the following card features has been approved:

Internal Scores (before separation) -- M-4, M-5, OM-2, OM-3, ID-1, ID-2, ID-3 and S-1. NOTE: When using OM-2 or OM-3, either reading must be terminated prior to the column that is scored, or, reading of the scored column and the two adjacent columns must be suppressed by means of program-controlled Read Column Eliminate. S-2 may be used prior to folding, and after folding if the card is properly flattened.
**IBM 3521 Card Punch**

**Purpose:** Punched card output unit for the 3770 Data Communication System or 3081 Information System.

**Highlights:** Used primarily for punched card output on the 3770 System or 3081 Information System via 3289 Printer mdl 3 but can, when equipped with appropriate optional features, be used alternately as a card reader and/or print information on a card. The 3289-3, 3771, 3774, 3775, 3776 or 3777 mdl 2 or 3 performs all format control and analysis.

Rated 80-column card speed is 50 cards per minute. Hopper and stacker capacity is approximately 400 cards.

The 3521 is a table-top unit that is placed on top of the 3782 Card Attachment Unit mdl 1.

**Card Limitations:** Generally, special feature cards require careful handling and a favorable environment. Use of the following has been approved:

- **External Scores (after separation) — column 80 end only:** M-4 and M-6.
- **Internal Scores (before separation) — M-4, M-5, OM-2, OM-3, ID-1, ID-2, ID-3, S-1, S-2 may be used prior to folding.
- **Note:** Also see limitations that apply for Card Read/Punch Check (#1521).

**Corner Cuts** — any corner: C1, C2, C3 and C5.

**Colors** — brown, red, blue, white, yellow, salmon, green and natural. With Card Print (#1501), print contrast will be reduced on brown, red, blue, salmon and green cards.

All other special feature cards may result in unsatisfactory performance.

**PREREQUISITES:** A 3782 Card Attachment Unit mdl 1 for attachment to a 3289-3, 3771, 3774, 3775, 3776 or 3777 mdl 2 or 3 equipped with 3782/3521 Card Punch Attachment (#8105).

**Bibliography:** GC20-0001

**SPECIAL FEATURES**

- **CARD PRINT (#1501):** For printing up to 80 positions along the top edge of the card. A 64 character set (including blank) is provided. Orders must specify #9491 for EBCDIC, or #9494 for ASCII (3770 System only). Uses a blank ink roll replaceable by the customer.

**Field Installation:** Yes.

**CARD READ/PUNCH CHECK (#1521):** Allows the 3521 to be used alternately as either a card punch or card reader. Read speed is the same as punch speed (50 cpm). This feature also provides for detection of punching errors by comparing the data read from the card with the punch data for each column. When an error is detected, the machine stops and an error indicator is lit.

**Field Installation:** Yes. **Limitations:** (1) Punch checking must be inhibited using 3770 or 8100 job control when punching cards with internal scores or cards that have been preprinted. (2) This feature is limited to the Punch Checking function only if the host 3289-3, 3774, 3775, 3776 mdl 1 or 2 is also equipped with a 2502 or with 3782/3521 Card Reader. (3) This feature is limited to the Punch Checking function only if the 3521 is attached to a 3776 mdl 3 or 4, or a 3777 mdl 2 or 3.

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**IB M 3525 CARD PUNCH**

**Purpose:** Punched card output unit for a S/360 mdl 195 or any S/370 Processor or 4300 Processor.

**Model**

<table>
<thead>
<tr>
<th>Rated 80-column Card Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
</tr>
<tr>
<td>P2</td>
</tr>
<tr>
<td>P3</td>
</tr>
</tbody>
</table>

**Highlights:** The 3525 is a full-function card punch which, when equipped with the appropriate special features, can read and/or print as well as punch 80 column cards in a single pass through the machine. The 3525 attaches natively to a S/370 mdl 125, or via (and within 20 feet of) a channel-attached 3505 Card Reader mdl B1 or B2 to a S/360 mdl 195, any S/370 Processor, or any 4300 Processor... see "PREREQUISITES" below.

The basic unit has a 1,200-card capacity hopper and two 1,200-card capacity stackers. Either the Extended BCD Interchange Code (256 codes) or Card Image (Data Mode 2) can be punched. Punched parallel, row by row. Cards go to stacker 1 unless program directed to stacker 2.

Card punching is checked by monitoring the movement of all 80 punches. A card in which a punching error is detected is automatically directed to a dedicated, 200-card capacity error stacker and followed by two automatic punching retries... the first punched card is directed to the error stacker for analysis purposes... the second preprocessed card is directed to the stacker originally selected for the error card. Note: Because of automatic punch retry, it is recommended that preprocessed or serially numbered preprinted cards not be used in a punch/punch mode. When used in a read/punch mode... see Card Read in "Special Features"... detected punching errors do not result in automatic punching retry and preprocessed or serially numbered preprinted cards can be used. In a read/punch mode, a detected punching error causes the machine to stop and manual error recovery procedures are required.

**Maximum: S/360 mdl 195, any S/370 Processor, or any 4300 Processor** — one 3525 can be attached via each 3505 Card Reader mdl B1 or B2... S/370 mdl 125 -- one 3525 can be natively attached via the appropriate adapter on the 3125... see 3125.

**PREREQUISITES:** S/360 mdl 195, any S/370 Processor, or any 4300 Processor -- a 3505 Card Reader mdl B1 or B2 with a 3525 Punch Adapter (#8103), or 3525 Read Punch Adapter (#8105) -- S/370 mdl 125 -- native attachment via the Integrated 3525 Card Punch Attachment (#8685) on the 3125.

**Card Limitations:** Generally special feature cards require careful handling and a favorable environment. Use of the following card features has been approved:

- **Internal Scores (before separation) — M-4, M-5, OM-2, OM-3, ID-1, ID-2, ID-3 and S-1. When reading cards with internal OM-2 or OM-3 scores (Card Read feature installed), either reading must be terminated prior to the column that is scored, or reading of the scored column and the two adjacent columns must be suppressed by means of the program-controlled read column elimination feature provided standard with Card Read. S-2 may be used prior to folding, and after folding if the card is properly flattened.

**External Scores (after separation) — Column 1 and 80 end: M-3, M-4, M-5, M-6, M-7, M-11, OM-2, CF-4 and CF-11. Column 1 end only: OM-3, 12 and 9 edge: CF-1/9A.**

**Corner Cuts** — any corner, C1, C2, C3 and C5.

**Card Stock** — regular, edge coated, and heavy duty.

**Port-A-PunchR** — can be punched in unscored fields of the card. Scored columns of these cards cannot be read.

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CARD PRICES:

Model (Data Mode 1) or Card Print (#5273) on 3525. MULTILINE CARD PRINT under program control, on any or all of 25 printing lines on the Card Read 3125. Also requires Two-line Card Print (#8339) or Multiline Card could cause card columns. May be used to prevent reading in columns that ahead of the punch station. Permits cards to be read in

el, the average number of lines printed and the location of the

open-punched card scores. See Port-A-Punch under

feature. Provides the ability to print, under program control, to suppress the reading of selected card columns. May be used to prevent reading in columns that could cause validity and read checks due to invalid codes or open-punched card scores. See Port-A-Punch under "Card Limitations" for restrictions. Field Installation: Yes. Prerequisites: 3525 Read Punch (#8105) on the 3505 mld B1 or B2, or 3525 Card Read Control (#9794) on the 3125.

MULTILINE CARD PRINT (#5273). Provides the ability to print, under program control, on any or all of 25 printing lines on the card. Each print line is 64 characters long and print locations are identical to that of the 2560 MFCM. Maximum speed, in cards/minute, when printing, depends upon the machine model only. Limitations: Not with #5273. Field Installation: Yes. Prerequisites: Basic Card Print (#1421) on the 3525. Also see "Specify" [4] above for specifying the desired character set.

TWO-LINE CARD PRINT (#8339). Identical in function to Multi-line Card Print (#5273) with the exception that printing is limited to lines 1 and 3 (above the 12 punching row and between rows 12 and 11). Maximum speed in cards/minute, when printing, depends upon the machine model only. Speeds are as follows:

<table>
<thead>
<tr>
<th>Basic Card Print (#1421) on the 3525. Also see &quot;Specify&quot; for specifying the desired character set.</th>
<th>1 line</th>
<th>2 lines</th>
<th>3 lines</th>
<th>4 lines</th>
<th>6 lines</th>
<th>10 lines</th>
<th>25 lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>100 cpm</td>
<td>100 cpm</td>
<td>100 cpm</td>
<td>100 cpm</td>
<td>100 cpm</td>
<td>100 cpm</td>
<td>100 cpm</td>
</tr>
<tr>
<td>P2</td>
<td>200 cpm</td>
<td>200 cpm</td>
<td>200 cpm</td>
<td>200 cpm</td>
<td>200 cpm</td>
<td>200 cpm</td>
<td>200 cpm</td>
</tr>
<tr>
<td>P3</td>
<td>300 cpm</td>
<td>300 cpm</td>
<td>300 cpm</td>
<td>300 cpm</td>
<td>300 cpm</td>
<td>300 cpm</td>
<td>300 cpm</td>
</tr>
</tbody>
</table>

Limitation: Not with #8339. Field Installation: Yes. Prerequisites: Basic Card Print (#1421) on the 3525. Also see "Specify" [4] above for specifying the desired character set.

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IBM 3540 DISKETTE INPUT/OUTPUT UNIT

Purpose: Input/output device for use with any virtual storage S/370 Processor, or any 4300 Processor.

Model B1 Has one drive.
Model B2 Has two drives.

Highlights: The 3540 provides the ability to read or write IBM Diskettes on S/370, or any 4300 Processor system. The diskette is the same recording medium used by the 3740 Data Entry System, and as such, the 3540 provides a facility for entering data recorded by the 3740 directly into an S/370, or any 4300 Processor. The IBM Diskette is organized into 75 tracks, 26 sectors per track, 128 bytes per sector. 73 tracks are used for data. The data capacity of the diskette is therefore, 1,868 sectors, or 242,944 bytes.

The models provide a choice of one or two diskette drives. Each drive uses a stepping motor to control the positioning of its associated read/write head assembly. Each drive also has an associated diskette hopper and stacker. Diskettes are fed, one at a time, from the hopper and automatically mounted on a drive spindle for read/write operations. Following completion of reading or writing, the diskette is automatically removed from the spindle and stacked. Hopper and stacker capacities are 20 diskettes each.

Disk speed is 360 revolutions/minute.

The 3540 has a self-contained control unit and provides double 128-byte buffers associated with each drive. The control unit operates the drives in a non-shared mode and thus each drive receives a separate subchannel when attached to a byte multiplexer channel. Effective speed depends upon the number of sectors read or written per revolution and upon the average number of sectors recorded on the diskettes. Maximum speeds per drive, including program Open Time (2 seconds/disk for Read; 10 seconds/disk for Write), and including time to feed and stack diskettes, are shown below for several combinations. For simultaneous processing on both drives, the realizable speed per drive is a function of the type of channel, speed of the channel, type of operating system, and the application programs.

<table>
<thead>
<tr>
<th>Sectors/Sec</th>
<th>Sectors/Sec (read)</th>
<th>Sectors/Sec (write)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revolution</td>
<td>Full Disk 1/2 Disk 1/5 Disk</td>
<td>Full Disk 1/2 Disk 1/5 Disk</td>
</tr>
<tr>
<td>1</td>
<td>600 625 575 520</td>
<td>70 75 75 75</td>
</tr>
<tr>
<td>2</td>
<td>600 625 575 520</td>
<td>310 310 310 310</td>
</tr>
<tr>
<td>3</td>
<td>2820 2255 1585</td>
<td>1500 1250 850</td>
</tr>
<tr>
<td>5</td>
<td>3635 2970 1925</td>
<td>2210 1710 1020</td>
</tr>
</tbody>
</table>

The 3540 is supported as a sequential DASD device only.

IBM Diskettes:

Limitation: The use of a 3540 on an S/370 does not eliminate the minimum configuration requirements for a card reader, except in a S/370 m115 or 125 cardless configuration. Refer to "Minimum Configuration" paragraph of the "Systems" section for S/370 m115 and m125.

For minimum configuration requirements on the 4331 or 4341 Processors, refer to the "Minimum Configuration" paragraphs of the "Systems" section for the 4300 Processors.

Maximum: The number of 3540 models B1 and/or B2 that can be attached depends upon the number of system control unit positions available.

PREREQUISITE: Each 3540 requires an available control unit position on a channel.

S/370 m115, 125 -- Byte Multiplexer Channel (special feature) ... see 3115, 3125.
S/370 m115 135 -- Byte Multiplexer Channel (standard), Selector Channels (special features), Block Multiplexer Channel (special feature) ... see 3135.
S/370 m115 135-3 -- byte multiplexer channel (standard), Block Multiplexer Channels (special feature) ... see 3135-3.
S/370 m115 138 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3138.
S/370 m115 145 -- Byte Multiplexer Channel (standard), Selector Channels (first one is standard), Block Multiplexer Channels (special features) ... see 3145.
S/370 m115 145-3 -- byte multiplexer channel (standard), block multiplexer channels ... see 3145-3.
S/370 m115 148 -- byte multiplexer channel (standard), block multiplexer channels (standard) ... see 3148.
S/370 m115 145 II, 158 -- Byte Multiplexer Channel (standard), 2nd Byte Multiplexer Channel (special feature), Block Multiplexer Channels (first two are standard) ... see 3155, 3158.
S/370 m115 165 II, 168 -- selector channel of 2860, basic mult-plexer channel of 2870, shared or non-shared subchannel of 2880 (non-shared is recommended) ... see 2860, 2870, 2880.
S/370 3031, 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031, 3032.
S/370 3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033.
4331 Processor -- byte multiplexer channel (special feature), block multiplexer channel (two are standard) ... see 4331.
4341 Processor -- byte multiplexer channel (standard), block multiplexer channel (two are standard) ... see 4341.

Bibliography: S/370 -- GC20-0001

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): #9902 for 208 V, or #9904 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

PRICES: Mdl MRC MAC/ MLC Purchase MMC
3540 B1 $ 679 $ 578 $22,870 $37.00
B2 1,023 871 34,830 51.50

Plan Offering: Plan A, Additional Use Charge Rate: 10% Metering: I/O Unit (Online) Warranty: B Maintenance: C Purchase Option: 50% Useful Life Category: 2 Per Call: 2 Model/Feature Additional Charge in lieu of AU Charge: 10% Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From model B1 to model B2 ..... $11,960

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IBM 3601 FINANCE COMMUNICATION CONTROLLER

Purpose: A programmable controller for attachment of 3600 Fi-
nance Communication System terminals to S/370 or 4300 Pro-
cessors using appropriate virtual storage system control programs.

S/370 or 4300 Processor attachment is via a 3704/3705 Commu-
nications Controller using synchronous data link control (SDLC)
transmission over various common carrier or user-owned transmis-
sion facilities. Attachment is also possible via the Communications
Adapter feature on the 4331. See Section 4331 for details. See note
"Programming" and "SCP" pages for attachment capability.

Model 1 A programmable controller with a diskette drive
which accommodates one-sided removable diskettes, the
maximum of six loops, and a maximum of 56K
bytes of user programmable storage.

Remote terminal attachments * are available.

Model 2A A programmable controller with a diskette drive
which accommodates one-sided removable diskettes, the
maximum of six loops, and a maximum of 120K
bytes of user programmable storage.

Remote terminal attachments * are available.

Model 2B A programmable controller with a diskette drive
which accommodates one or two-sided removable
diskettes, a maximum of eight loops, and a maximum of
120K bytes of user programmable storage.

Remote terminal attachments * are available.

Model 3A A programmable controller with a diskette drive
which accommodates one-sided removable diskettes, the
diskette drive, a maximum of six loops, and a maximum of
120K bytes of user programmable storage.

Remote terminal attachments * are available.
* Remote terminal attachments can be
achieved on the total number of loops indi-
cated by one or a combination of the follow-
ing, as applicable.

DEVICE OR FEATURE

<table>
<thead>
<tr>
<th>DEVICE OR FEATURE</th>
<th>3601</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEAT. #</td>
<td>2A</td>
</tr>
<tr>
<td>1200 BPS Loop</td>
<td></td>
</tr>
<tr>
<td>Integrated Modem</td>
<td>#8001</td>
</tr>
<tr>
<td>Term. Attach Unit</td>
<td>3603-1</td>
</tr>
<tr>
<td>EIA Interface</td>
<td>RPQ</td>
</tr>
</tbody>
</table>

Highlights: Controls all the functions of the 3600 Finance Communica-
tion System terminals. Controls data transmission between ter-
ninals and the central processing site. Four SDLC Communica-
tions features are available one of which is required for transmis-
sion to and from the Host. An SDLC Communications feature
achieves a maximum of 6 loops and a maximum of
120K bytes of user programmable storage.
Remote terminal attachments * are available.

Model 1 -- contains approximately 24K bytes of programmable
storage. Four additional increments of 6K bytes of programmable
storage (for a total of 56K) are available. The amount of program-
ritable storage available for application programming depends upon
the attached terminal configuration and user environment ... see
Additional Storage Feature (#1005).

Models 2A, 2B, 3A and 3B -- contain approximately 24K bytes of
programmable storage. Six additional increments of 16K bytes
or three increments of 32K bytes of programmable storage (for a
total of 120K) are available. The amount of programmable storage
available for application programming depends upon the attached
terminal configuration and user environment ... see Additional
Storage Feature (#1006 or #1007).

Models 1, 2A and 3A house a direct access diskette drive to
which provides permanent storage for control and user programs, plus temporary and permanent
storage for user data (sequential logging, random retrieval of data
records, etc.).

Models 2B and 3B house a direct access diskette drive to
with a two-sided removable diskette which provides permanent
storage for control and user programs, plus temporary and permanent
storage for user data (sequential logging, random retrieval of data
records, etc.).

All 3600 System terminals are attached by loops which operate at
speeds of 1200, 2400 or 4800 bps for locally attached terminals
and at 1200 bps for remotely attached terminals. The base unit
provides one loop. Two additional loops are available on models
2A and 2B while five additional loops are available on models
3A and 3B. 1200 bps loop integrated modems are available on mod-
els 1, 3A and 3B only ... see "Special Features." Note: Either
one or two 4800 bps loops per 3601 may be specified.

Communication between the 3601 and the 3704/3705 or the
Communications Adapter (#1601) on the 4331 Processor may be
either through the 1200 BPS Integrated Modem (#5500) on the
3601 or through an external modem using the EIA Interface
(#3701) on the 3601. Local attachment can be made to a
3704/3705 or Communications Adapter (#1601) on the 4331
Processor via its local attachment feature using #3701 on the
3601. See "Modems" and "Special Features" below. Each 3601
operates in half-duplex mode. Duplex communication line opera-
tions are possible with multiple 3601s attached to the line, one
3601 transmitting while the other receives.

Can be programmed to operate independently when the S/370 or
4300 Processor is unavailable. Capability of controlling all terminal
functions, executing arithmetic, and capturing data from the termi-
nals for later transmission to the 3/370 or 4300 Processor. A
keylock is provided for the removable diskette. One key is provid-
ed.

Transmission: The 3601 operates over common carrier-provided or
equivalent customer-owned communications facilities. For
information concerning these facilities, see the M 2700 pages.

Modems: External modems operating at speeds up to 9600 bps
may be used with SDLC features.

Prerequisites: Communications Controller equipped with appropri-
ate features ... see 3704, 3705 or 4331 for Communications
Adapter (#1601) on the 4331.

Bibliography: GC20-0370

SPECIFY: [1] Voltage (115 V AC, 1-phase, 60 Hz). #9880 for
locking plug, or #9881 for non-lock plug. Field Installation:
Not recommended.

Specify #9491 to identify the initial 3601 or 3602 ordered for
use with a host system location, or specify #9492 to identify
additional 3601s per host system.

If #9491 is specified for the 3601, specify: #9494 if there is
no link speed differences the SDLC feature to 9600 bps
allows a maximum controller aggregate baud rate of 12,000
bps for the loops independent of the host link speed ... see
"Communications Features."

Model 1 -- contains approximately 24K bytes of programmable
storage. Four additional increments of 6K bytes of programmable
storage (for a total of 56K) are available. The amount of program-
ritable storage available for application programming depends upon
the attached terminal configuration and user environment ... see
Additional Storage Feature (#1005).

Models 2A, 2B, 3A and 3B -- contain approximately 24K bytes of
programmable storage. Six additional increments of 16K bytes
or three increments of 32K bytes of programmable storage (for a
total of 120K) are available. The amount of programmable storage
available for application programming depends upon the attached
terminal configuration and user environment ... see Additional
Storage Feature (#1006 or #1007).

Models 1, 2A and 3A house a direct access diskette drive to
which provides permanent storage for control and user programs, plus temporary and permanent
storage for user data (sequential logging, random retrieval of data
records, etc.).

Models 2B and 3B house a direct access diskette drive with a
two-sided removable diskette which provides permanent
storage for control and user programs, plus temporary and permanent
storage for user data (sequential logging, random retrieval of data
records, etc.).
This is the address to which the first controller data tape will be automatically shipped for the first controller ordered (with specify #9491).

Whenever controller data is updated by an E.C., it will be shipped to the most current TPC address.


Device Attachment Table - A

<table>
<thead>
<tr>
<th>Device Type/Feature/Function</th>
<th>Attachment Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>3604</td>
<td>0</td>
</tr>
<tr>
<td>Mag, Stripe Encoder-Reader (#4905/4906)</td>
<td>0.6</td>
</tr>
<tr>
<td>3606</td>
<td>3.0</td>
</tr>
<tr>
<td>3608</td>
<td>5.8</td>
</tr>
<tr>
<td>3610, 3611 and/or 3612</td>
<td>2.4</td>
</tr>
<tr>
<td>3614 [with AET only]</td>
<td>2.2</td>
</tr>
<tr>
<td>3618</td>
<td>3.0</td>
</tr>
</tbody>
</table>

If additional function is required, utilize Device Attachment Table - B to determine if #1005 is required. Calculate the sum of the attachment factors for the combination of devices or function required. Add the attachment factor one time only for each device type. If the attachment factor sum is 2 or less, feature #1005 (Specify #9581) is not required. If the attachment factor sum is greater than 2 but does not exceed 10, feature #1105 (Specify #9582) is required. If the sum is greater than 10, but does not exceed 14, two feature #1005s (Specify #9581) are required. An attachment factor greater of 14 is not allowed.

Device Attachment Table - B

A description of attachment factor functions not associated with a specify, machine or feature is given later in this section: See Attachment Factor Functions.
3601 Finance Communication Controller (cont’d)

[8] Address sharing must be included if a 3616 is used.

[9] Both 3616 Part 1 and 3616 Part 2 must be included if programmable storage only. This additional storage can be utilized for the following four purposes: 1) User Programmable Storage ... 4) Control Storage Expansion. See below for description and limitations. Specify: #9591 for Control Storage, or #9592 for User Programmable Storage.

**ADDITIONAL STORAGE FEATURES:**

1. **User Programmable Storage:** Used for configuration data and application programs.

   **Feature #1006, Specify #9592** - provides an additional 16,384 bytes of User Programmable Storage. Maximum: For #1006 with #9592: Two. Field Installation: Yes.

   **Feature #1007, Specify #9602** - provides an additional 32,768 bytes of User Programmable Storage. Maximum: For #1007 with #9602: One. Field Installation: Yes. Prerequisite: On controllers shipped prior to 22E4, storage expansion feature (#8601) is required.

2. **User Programmable Storage Expansion:** (models 2A, 2B, 3A and 3B only). Used in addition to any #1006 (with #9592) increments or one #1007 (with #9602) increment of User Programmable Storage, described above, for the instruction sections of application programs. Neither application program constants nor configuration data can reside in expanded User Programmable Storage.

   **Feature #1006, Specify #9592** - provides an additional 16,384 bytes of User Programmable Storage. Maximum: (For User Programmable Storage plus User Programmable Storage Expansion): For #1006 with #9592 specified and with Storage Expansion Feature (#8601). Six. Prerequisite: If more than one Additional Storage Feature (#1006 with #9592) are ordered, the Storage Expansion Feature (#8601) is required. Field Installation: Yes.

   **Feature #1007, Specify #9602** - provides an additional 32,768 bytes of User Programmable Storage. Maximum: (For User Programmable Storage plus User Programmable Storage Expansion): For #1007 with #9602 specified and with Storage Expansion Feature (#8601) - Three. Prerequisite: If more than one Additional Storage Feature (#1007 with #9602) are ordered, or if in conjunction with any Additional Storage Feature (#1006 with #9592), then, Storage Expansion (#8601) is required. Field Installation: Yes.

3. **Control Storage:** Used for attachment of any combination of device types/features which have associated attachment factors. See Device Attachment Table - C below. Some combinations of device types can be accommodated with no further increments of control storage, while other combinations require additional increments of control storage.

   **Feature #1006, Specify #9591 [Models 2A, 2B, 3A and 3B only]** Provides one increment of 16,384 bytes of Control Storage for device attachment.

   Two Additional increments, for a total of 3 are available with Control Storage Expansion (see below). To determine whether and how many control storage increments (#1006 with #9591) are required, refer to Device Attachment Table - C below. Calculate the sum of the attachment factors for the combination of devices and/or functions required. Add the attachment factor for one time only for each device type, feature, or function. If the attachment factor sum is 10 or less, feature (#1006 with #9591) is not required. If the attachment factor sum is greater than 10, feature (#1006 with #9591) is required. An attachment sum greater than 22 is not allowed in this base attachment factor calculation.

**Maximum (for Control Storage):** For #1006 with #9591 - One. Field Installation: Yes.

4. **Control Storage Expansion (CSE)#1006, Specify #9591** (Models 2A, 2B, 3A and 3B only) Used to provide a greater attachment capability for certain features or devices which require an attachment factor. CSE supplements the base attachment factor limit of 22.0 by providing second and third increments of additional storage. An additional attachment factor of 12 can be obtained by utilizing the second increment of #1006 with specify #9591 or 28 by utilizing the second and third increments of #1006 with specify #9591. Only the attachment factors associated with certain device types, features or functions can be applied against this expanded attachment factor capability... see Device Attachment Table - C below.

While Control Storage Expansion provides additional attachment factor capability, the CSE attachment factor must be considered separately from the base attachment factor calculation. Specifically, the attachment factor for a given device or feature must be allocated against either the base or the expanded attachment factor but not both. Maximum: (For Control Storage plus Control Storage Expansion) -for #1006 with #9591 specified and with Storage Expansion Feature (#8601) - Three. Prerequisite: If more than one #1006 with specify #9591 is ordered, the Storage Expansion Feature (#8601) is required. Field Installation: Yes.

**Limitation:** The maximum number of #1006s (whatever the combination of specify #9591 and #9592), is seven for controllers shipped prior to E.C. 745887. The maximum number of #1006s commencing with units with E.C. 745887 is nine. The maximum number of #1007s is three.

The maximum number of #1007 plus #1006 (whatever the combination of specifies #9602, #9591 or #9592) for controllers shipped prior to E.C. 745887 is:

```
#1007 + #1006

<table>
<thead>
<tr>
<th>Quantity</th>
<th>#1007</th>
<th>#1006</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>
```

The maximum number of #1007s plus #1006s for controllers with E.C. 745887 is:

```
#1007 + #1006

<table>
<thead>
<tr>
<th>Quantity</th>
<th>#1007</th>
<th>#1006</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>7</td>
</tr>
</tbody>
</table>
```

**Device Attachment Table - C**

In the following table, attachment factors in the column labeled "Base" are applicable, to the base attachment factor calculation only. Attachment factors in the column labeled "Base or Expanded" are applicable to either the base or expanded attachment factor calculation.

The 3600 controller loads support for devices/features into control storage in the sequence indicated by the following table. Those RPQs with an attachment factor are also in a prescribed sequence, as indicated in the IBM 3600 Finance Communication System Configurator; G27-7262. The controller will attempt to load each device, feature, or RPQ into base control storage. If a device, feature, or RPQ is encountered that will not fit into base control storage and it is applicable to expanded control storage, the controller will attempt to load it into expanded control storage. The above algorithm must be used to determine control storage requirements.

Refer to the 3600 Finance Communication System Configurator, G27-7262, for a comprehensive list of attachment factors and additional information regarding calculation of base and expanded attachment factors.

A description of attachment factor functions not associated with a specify, machine or feature is given later in this section: See Attachment Factor Functions.

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3601 Finance Communication Controller (cont'd)

Device Type/Feature/Function                  Attachment Factor              Base or Expanded

3603 or 3604 mlds 1-6                           0
Storage Expansion Feature (#6501)               1.3
SDLC (#4501 or #4502)                          0.7
Multiple Block 1K Diskette                    3.0
3614 or 3624 [Note 1]                         1.2
3616 Part 1 [Notes 7 and 8]                   0.5
Optional Instruction Locator
Instruction Enhancements                        1.7
Translate Instruction (LTTR) [Note 3] 1.27
3620/3600 Datastream Mapping [Note 3]         0.8
Extended 3620/3600 Keyboard Mapping            0.7
[Note 9]

Data Encryption Standard (DES) [Note 1]        1.2
Alternate Encryption Technique (AET) [Note 1]   1.7
Priority Dispatching (LCHAP) [Note 3]          0.3
Data Sequencing                                1.6
Extra Statistical Counter Recording [Note 3]    1.3
3618                                           3.0
3615                                           3.2
3616 Part 2 [Notes 7 and 8]                    3.0
3610, 3611 and/or 3612 [Note 4]                2.6
3608 Printer [Note 5]                         2.8
Mag Stripe Encoder-Reader (#4905/#4906) [Note 6] 0.7
Set Diskette                                    0.9
3604 mld 7                                      0.5

Notes

[1] Although both DES and AET may be included, a single 3614 may have either DES or AET but not both. A 3624 may have only one DES.

[2] Address sharing must be included if a 3606 is used.

[3] The optional instruction locator must be included if this function is used. If more than one function requiring the optional instruction locator is used, the attachment factor for the locator need be included only once.


[5] Address sharing must be included if a 3608 is used. The 3606 must also be included to use the 3608 keyboard/display. Address sharing need be included only once to utilize both the 3608 printer and keyboard/display.

[6] The Magnetic Stripe Reader (#4901 or #4902) need not be considered in computing the attachment factor.

[7] Both 3616 Part 1 and 3616 Part 2 must be included if a 3616 is used.

[8] Address sharing must be included if a 3616 is used. If more than one device/RPC requiring address sharing is used, the attachment factor for address sharing need be included only once.

[9] 3620/3600 Datastream Mapping must be included if the Extended 3620/3600 Keyboard Mapping is used.

EIA INTERFACE [#3701]. Provides the appropriate cables and interface logic necessary to attach an external IBM modem for communications to the host processor through the 3704/3705 or for local attachment to the 3704/3705 or the Communications Adapter (#1601) on the 4331 Processor without requiring modems... see feature #4716 under 3704 or 3705, or feature #1601 under 4331. Non-IBM modems may be attached subject to the Multi-access System Policy. Maximum: One. Field Installation: Yes. Prerequisite: SDLC Communications Feature with Clocking (#6301 or #4501) or SDLC Communications Feature without Clocking (#6302 or #4502). Limitation: Cannot be installed with a 1200 BPS Integrated Modem (#5500).

LOOP FEATURE, ADD'L (#4735). Provides the ability to attach additional 3600 Finance Communication System terminals. Maximum: Limit to one model 2A or 2B. Five per models 1A and 3B. Field Installation: Yes. Prerequisite: For each loop with any remotely attached terminals, 1200 BPS Loop Integrated Modem (#6501 or #6502) on a terminal or a 3603 is required. Limitation: A maximum of two loops (including the provided local loop) operating at 4800 bps per 3601 are allowed when one of the SDLC terminal features (#4501 or #4502) are specified. Otherwise, the maximum is one loop operating at 4800 bps (including the provided local loop). Loop Integrated Modem (#6500) cannot be installed on models 2A and 2B. Note: The sum of the speeds of all loops in bits per second (bps) plus the speed of the SDLC link (#6301 or #6302) in bps cannot exceed 12,000 bps. When SDLC feature (#4501 or #4502) is installed, the sum of all loops cannot exceed 12,000 bps (do not use the host link speed).

1200 BPS INTEGRATED MODEM (#5500). An integrated modem for operation at 1200 bps over non-switched half-duplex or duplex voice grade lines for communication to the CPU through the 3704 or 3705, or the Communications Adapter (#1601) on the 4331 Processor. Note: This integrated modem must communicate with another IBM 1200 bps integrated modem. Specify: #9651 for 4-wire strapping, #9662 for 2-wire strapping. Maximum: One. Field Installation: Yes Prerequisite: SDLC Communications Feature with Clocking (#6501 or #6301). Limitation: Cannot be installed with the EIA Interface (#3701).

COMMUNICATIONS FEATURES -- each 3601 must be equipped with one of the following SDLC features and either the EIA Interface (#3701) or the 1200 BPS Integrated Modem (#5500) for communication with the host processor.

SDLC COMMUNICATIONS FEATURE WITH BUSINESS MACHINES CLOCKING (#4501). Required for attachment to communication lines through the 1200 BPS Integrated Modem (#5500), or the EIA Interface (#3701) with any external modem which does not have internal clocking at 1200 bps. The SDLC link speed of this feature need not be included when calculating the sum of the speeds of all loops to exceed the aggregate baud rate of 12,000 bps. Maximum: One. Limitations: Cannot be installed with #6301, #6302 or #4502. Field Installation: Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#6301). Required for attachment to communication lines through 1200 BPS Integrated Modem (#5500), or an EIA Interface (#3701) with any external modem which does have internal clocking at 1200 bps, or for local attachment to a 3704 or 3705 Communications Controller or the Communications Adapter (#1601) on a 4331 Processor. Maximum: One. Limitation: Cannot be installed with #6302, #4501 or #4502. Field Installation: Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#6302). Required for attachment to communications lines through an external modem which does have internal clocking at speeds up to 9600 bps. The SDLC link speed of this feature need not be included when calculating the sum of the loop speeds not to exceed the controller aggregate baud rate of 12,000 bps. Maximum: One. Limitation: Cannot be installed with #6301, 6302 or 4502. Field Installation: Yes. Prerequisite: EIA Interface (#3701).

SDLC COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCKING (#6301). Required for attachment to communication lines through the 1200 BPS Integrated Modem (#5500), or an EIA Interface (#3701) with any external modem which does have internal clocking at 1200 bps, or for local attachment to a 3704 or 3705 Communications Controller or the Communications Adapter (#1601) on a 4331 Processor. Maximum: One. Limitation: Cannot be installed with #6302, #4501 or #4502. Field Installation: Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#6302). Required for attachment to communications lines through an external modem which does have internal clocking at speeds up to 4800 bps. Maximum: One. Limitation: Cannot be installed with #6301, 6302 or 4502. Field Installation: Yes. Prerequisite: EIA Interface (#3701).

STORAGE EXPANSION FEATURE (#5600). [mlds 2A, 2B, 3A and 3B only] Provides capability of (1) expanding user programmable storage (#1006 with specify #9592 or #1007 with specify #9602) beyond 56K bytes, and/or (2) adding additional increments of #1006 with specify #9591, beyond 16K bytes. Maximum: One. Field Installation: Yes. Notes: The Feature (#6501) is required when more than one Additional Storage Feature (#1006 with specify #9591), or more than two Additional User Programmable Storage Features (#1001 with specify #9592), or more than one Additional Storage Feature (#1007 with specify #9602), or Additional Storage Feature (#1007 with specify #9602) with Programmed Storage Feature (#1006 with specify #9592), or more than one Additional Storage Feature (#1007 with specify #9602), or Additional Storage Feature (#1007 with specify #9602) with User Programmable Storage Feature (#1006 with specify #9592), or more than one Additional Storage Feature (#1007 with specify #9602). Field Installation: Not to be utilized. If released earlier than Independent Release 4 and Controller Data ECs 745122 and 745123 are utilized, the controller will work properly with the Storage Expansion Feature (#5601) installed, but Control Storage Expansion cannot be utilized. If releases earlier than Independent Release 4 and Controller Data ECs 745122 and 745123 are utilized, neither the Storage Expansion Feature (#5601) nor more than one Additional Storage Feature (#1006 with specify #9591) should be installed.

1200 BPS LOOP INTEGRATED MODEM (#8001). [mlds 1, 3A or 3B only] An integrated modem for transmission to remotely located 3600 Finance Communication System terminals. Operates at 1200 bps over non-switched normal or voice grade telephone lines. Note: Several remote loop configuration variations can be realized, e.g., see the IBM 3600 FCS Configurator, GAG27-2762. However, regardless of configuration, the interconnecting common carrier facilities are always point-to-point circuits; either 2-wire half-duplex or 4-wire duplex. The common carrier does not support 3600 FCS "remote loops." The common carrier must be referenced in the CA server configurator information or in the M 2700 pages for definition of the various elements of the remote loop.

Maximum: One per Additional Loop Feature (#4735). Field Installation: Yes. Prerequisite: Additional Loop Feature (#4735).
3601 Finance Communication Controller (cont'd)

Each remote location must have either a 3604 Keyboard Display Mdl 2, 3 or 4 equipped with a 1200 BPS Loop Integrated Modem (#8001 or #8002), a 3606 Mdl 2, a 3608 Mdl 2, a 3614 Consumer Transaction Facility with a 1200 bps Loop Integrated Modem (#8001) or a 3603 as the first attached remote unit in each physical (geographic) location.

ATTACHMENT FACTOR FUNCTIONS

Data Sequencing -- allows user applications to sequence, in storage, a block of data items or to collate, in storage, data items from two separate blocks into a third block, according to a parameter list.

Set Diskette -- allows user applications to reset the temporary files, to specify the type of start-up (i.e. warm or cold) to be performed on the next load, and/or to initiate a load of the controller.

Instruction Enhancements -- provides the user application with the following new instructions:

- Bit Manipulating - Test and Branch (LIFON, LIFOFF) -- provide a test, set, and branch function in a single instruction. This reduces the 3600 AP processing and memory requirements when processing single bits.

Logical Compare Data Immediate (CCDI) -- compares immediate data to data in a specified field.

Move Data Immediate (MVDI) -- moves immediate data to a specified field.

Load Data Immediate (LDDI) -- loads immediate data into specified register.

SCALE -- formats an input string of characters into a conveniently processable numerical format. When used in processing monetary input, functions such as the removal of the monetary symbol, commas, and periods from the input data are automatically done. In the event that cents were not in the input data, zero padding is optionally provided. SCALE should significantly reduce the number of instructions required to process monetary input.

Segment Indexing (SETX, TESTX, SETXREG) -- provides an alternate method of referencing data within a segment. Only fixed operands of 3600 instruction may be indexed. This function can be used to reduce the number of SETFPL instructions executed by the AP, thereby enhancing performance and reducing AP size. This function also provides a pseudo DSECT facility, thereby enabling an AP to more readily reference (1) variably displaced data beginning of a segment.

Branch on Index (BRANX) -- provides an index increment, compare and branch function in a single instruction. This instruction is used to control the number of times a series of AP instructions will be executed. Since the instruction algebraically increments a register, BRANX can be used in conjunction with the Segment Indexing facility to simplify the processing of tables.

Execute (LEXEC) -- provides a function similar to the S/370 EXECUTE instruction. The amount of data logically OR'ed into the target instruction may be 2, 4 or 6 bytes.

Priority Dispatching -- provides the ability to specify the order in which 3601/3602 workstations are dispatched. This function consists of the LCHAP instruction which activates or deactivates the dispatching priority specified in the table(s) generated by the PRIDSP macro.

Translate -- the LRT instruction processes an input data stream against user specified translate table(s) to generate a translated output data stream. The LRTBEG, LRTEND and LRTGEN instructions assist the user application programmer in specifying the translate table(s).

Extended Statistical Counter Recording -- provides the option to enhance statistical counter recording facilities to assist in fault isolation of degraded loop segments. This facility is particularly useful when a loop consists of multiple remote locations.

Multiple Block I/O - Diskette -- permits multiple blocks to be accessed with a single execution of the LREAD and REPLACE instruction for permanent file and absolute addressing access. This may also result in enhanced performance when more than 3 blocks are read or 4 blocks are written.

3270/3600 Datastream Mapping -- provides, via four new 3600 assembler language instructions, 3600 controller assistance in converting 3270 output datastreams into any output datastream processable by 3600 attached devices, and 3604 input datastreams into 3270 input datastreams. Additionally, these instructions can aid in converting 3604 output display datastreams into 3270 output display datastreams. Input and output screen sizes are supported as specified by the application programmer. The 3270 TAB, CLEAR, PA and PF keys are simulated.

Extended 3270/3600 Keyboard Mapping -- provides simulation of the 3270 INSERT, DELETE, ERASE TO END OF FIELD and ERASE INPUT keyboard functions.

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IBM 3602 Finance Communication Controller

Purpose: A programmable controller for attachment of 3600 Finance Communication System terminals to S/370 or 4300 processors using appropriate virtual storage system control programs. Attachment is via a 3704/3705 Communications Controller or the Communications Adapter (#1601) feature on the 4331 Processor using synchronous data link control (SDLC) transmission over various common carrier or user-owned transmission facilities. NOTE: See "Programming" and "SCP" pages for attachment capability.

Model 1A A large-file programmable controller with a 5.2 meg disk, a drive which accommodates one or two-sided removable diskettes, 16K or 32K increments of storage, and a maximum loop capability of eight of which seven can be remote.

Model 1B A large-file programmable controller with a 9.3 meg disk, a drive which accommodates one or two-sided removable diskettes, 16K or 32K increments of storage, and a maximum loop capability of eight of which seven can be remote.

Highlights: Controls all the functions of 3600 Finance Communication System terminals. Controls data transmission between those terminals and the central processing site. Four SDLC Communications features are available in one of the eight controllers, each of which is required for transmission to the Host. An SDLC Communications feature at speeds from 1200 bps to 4800 bps or an SDLC Communications feature at speeds from 1200 bps to 9600 bps can be selected. Besides Host link speed differences the SDLC feature to 9600 bps allows a maximum controller aggregate baud rate of 12,000 bps for the loops independent of the Host link speed. See "Communications Features." Contains approximately 24K bytes of programmable storage. Six additional increments of 16K, or three increments of 32K, bytes of programmable storage (for a total of 120K) are available. The amount of programmable storage available for application programming depends upon the attached terminal configuration and user environment. See Additional Storage Feature (#1006 or #1007) under "Special Features." Houses a direct access diskette drive with two-sided removable diskette which provides permanent storage for control and user programs, plus temporary and permanent storage for user data (sequential logging, random retrieval of data records). Houses a disk storage device for storage of user data. This storage device is not removable except by service personnel. Includes a fixed diskette feature which will provide 8 additional heads with a fixed diskette feature on 33 tracks...See Additional Disk Heads Feature (#1010, #1011).

All 3600 System terminals are attached by loops which operate at speeds of 1200, 2400 or 4800 bps for locally attached terminals and at 1200 bps for remotely attached terminals. The base unit provides one loop. Seven additional loops are available. Integrated modems are available in both models...See "Special Features." Note: Either one or two 4800 bps loops per 3602 may be specified.

Communication between the 3602 and the 3704/3705 or the Communications Adapter (#1601) feature on the 4331 Processor may be either through the 1200 BPS Integrated Modem (#5500) on the 3602 or through an external modem using the EIA Interface (#3701) on the 3602. Local attachment can be made to a 3704/3705 or the Communications Adapter (#1601) feature on the 4331 Processor via its local attachment feature using #3701 on the 3602. See "Modems" and "Special Features" below. Each 3602 operates in half-duplex mode. Duplex communication line operations are possible with multiple 3602s attached to the line, one 3602 transmitting while the other receives. Can be programmed to operate independently when the CPU is unavailable. Capable of controlling all terminal functions, except arithmetic, and capturing data from the terminals for later transmission to the CPU.

Transmission: The 3602 operates over common carrier-provided or equivalent customer-owned communications facilities. For information concerning these facilities, see the M 2700 pages.

Modems: External modems operating at speeds up to 9600 bps may be used with SDLC features.

Modem Speed (bps) Facility
3863 2400 Switched or non-switched voice grade lines
3872 2400 Switched or non-switched voice grade lines
3864 4800 Switched or non-switched voice grade lines
3874 4800 Switched or non-switched voice grade lines
3875 7200 Non-switched voice grade lines
3873 9600 Non-switched voice grade lines

Note: Switched line operation is not supported by the 3601/3602 integrated 1200 bps modem.

Supplies: For customer-usable diskettes, see IRD Sales Manual.

Prerequisite: Communications with a S/370 or 4300 Processor with virtual storage capability via a 3704 or 3705 Communications Controller equipped with appropriate features or the Communications Adapter (#1601) feature on the 4331 Processor...See 3704, 3705 and 4331 pages.

Bibliography: GC20-0370


[2] Controller Designation: Media distribution of Controller Data. Specify #9491 to identify the initial 3602 or 3601 ordered for use with a host system location, or specify #9492 to identify additional 3602s per host system.

If #9491 is specified for the 3602, specify: #9494 if there is no 3614 or 3624 with a first position designator attached to any 3602 on the same host system, or...#9493 if there is a 3614 or 3624, with a first position designator and #9002 attached to any 3602 on the same host system, and/or...#9495 if there is a 3614 or 3624 with a first position designator and #9001 attached to any 3602 on the same host system or if encryption capability, via the Data Encryption Standard (DES), is desired in the 3600 controller. See Host Attachment Designation...Specifying the initial 3614, or Controller-Data Designation under "Specify" for the 3624.

If #9491 is specified, select the specific type of the desired media.

When feature #9491 is specified, additional shipping information is required.

* 9600 Non-switched digital data service
* No standard IBM Modem available.

This is the address to which the first controller data tape will be shipped automatically for the first controller ordered (with specification #9491). Whenever controller data is updated by an E.C., it will be shipped to the most current M 2700 address.


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One additional increment of control storage is available without utilizing Control Storage Expansion (#6501). Two additional increments, for a total of three, are available with #6501. To determine whether and how many control storage increments (#1006 with specify #9591) are required, refer to the Device Attachment Table below. Calculate the sum of the attachment factors for the combination of devices or functions required. Add the attachment factor one time only for each device type, feature or function. If the attachment factor is 10 or less, feature #1006 with specify #9591 is not required. If the attachment factor sum is greater than 10, feature #1006 with specify #9591 is required. An attachment factor greater than 22 is not allowed in this base attachment factor calculation. Maximum: (For Control Storage - #1006 with specify #9591) -- One. Field Installation: Yes.

4. Control Storage Expansion (CSE)(Feature #1006 - Specify #9591). Used to provide a greater attachment factor capability for certain features or devices which require an attachment factor. CSE supplements the base attachment factor limit of 22.0 by providing second and third increments of additional storage. An additional attachment factor capability of 12 can be obtained by utilizing the second increment of #1006 with specify #9591, or 28 by utilizing the second and third increments of #1006 with specify #9591. Only the attachment factors associated with certain device types, features or functions can be applied against this expanded attachment factor capability ...

see Device Attachment Table below.

While Control Storage Expansion provides additional attachment factor capability, the CSE attachment factor must be considered separately from the base attachment factor calculation. Specifically, the attachment factor for a given device or feature must be allocated against either the base or the expanded attachment factor but not both. Maximum: (Control Storage plus Control Storage Expansion): For #1006 with specify #9591 -- Three. Prerequisite: If more than one Control Storage Feature (#1006 with specify #9591) is ordered, Storage Expansion Feature (#6501) is required. Field Installation: Yes.

Limitation: The maximum number of #1006s (with any combination of specifies #9591 and #9592) is nine. The maximum number of #1007s is three.

The maximum number of #1007s plus #1006s (whatever the combination of specifies #9602, #9591 or #9592) is:

#1007 + #1006

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Device Attachment Table

In the following table, attachment factors in the column labeled 'Base' are applicable to the base attachment factor calculation only. Attachment factors in the column labeled 'Base or Expanded' are applicable to either the base or expanded attachment factor calculation.

The 3800 controller loads support for devices/features into control storage in the sequence indicated by the following table. Those RPQs with an attachment factor are also loaded in a prescribed sequence, as indicated in the IBM 3600 Finance Communication System Configurator, GA27-2768. The controller always attempts to load each device, feature, or RPQ into base control storage. If a device, feature, or RPQ is encountered that will not fit into base control storage and it is applicable to expanded control storage, the controller will attempt to load it into expanded control storage. The above algorithm must be used to determine control storage requirements.

Refer to the 3600 Finance Communication System Configurator, GA27-2768 for a comprehensive list of attachment factors and additional information regarding calculation of base and expanded attachment factors.

A description of attachment factor functions not associated with a specify, machine or feature is given later in this section: See Attachment Factor Functions.
### Notes

1. Although both DES and AET may be included, a single 3614 may have either DES or AET but not both. A 3624 may have only DES.

2. Address sharing must be included if a 3606 is used.

3. The optional instruction locator must be included if this function is used. If more than one function requiring the optional instruction locator is used, the attachment factor for the locator need be included only once.

4. Any 3610, 3611 and 3612 combination constitutes one device type.

5. Address sharing must be included if a 3606 is used. The 3606 must also be included to use the 3608 keyboard/display. Address sharing need be included only once when calculating the attachment factor.

6. The Magnetic Stripe Reader (#4901 or #4902) need not be considered in computing the attachment factor.

7. Both 3616 Part 1 and 3616 Part 2 must be included if a 3616 is used.

8. Address sharing must be included if a 3616 is used. If more than one device/PPR requiring address sharing is used, the attachment factor for address sharing need be included only once.

9. 3270/3600 Datastream Mapping must be included if the Extended 3270/3600 Keyboard Mapping is used.

### ADDITIONAL DISK HEADS

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### EIA INTERFACE

#### #3701

Provides the appropriate cables and interface logic necessary to attach an external IBM modem for communications to the host processor through the 3704/3705 or the Communications Adapter (#1601) feature on the 4331 Processor or for local attachment to the 3704/3705 or the Communications Adapter (#1601) feature on the 4331 Processor without requiring modems ... see 3704/3705, feature #4716, or 4331 pages in sales manual. Non-IBM modems may be attached subject to the multiple Suppliers System Policy. Maximum: One. Field Installation: Not recommended.

### LOOP FEATURE

#### ADD'L (#4735)

Provides the ability to attach additional 3600 Finance Communication System terminals. Maximum: 2 loops. Field Installation: Yes. Prerequisite: For each loop with an remotely attached terminals, a 1200 BPS Loop Integrated Modem (#8001 or #8002) on the terminal, or a 3600 is required. Field Installation: Yes. Prerequisite: For each loop with a provided local loop) operating at 4800 bps are allowed when one of the SDLC Communication Features (#4501 or #4502) are specified. Otherwise, the maximum is one loop operating at 4800 bps (including the provided local loop).

### STORAGE EXPANSION FEATURE

#### #6501

Provides capability of (1) expanding user programmable storage (#1006 with specify #9592 or #1007 with specify #9602) beyond 56K bytes and/or (2) adding additional increments of #1006 with specify #9591, beyond 16K bytes. Maximum: One. Field Installation: Yes. Prerequisite: #5500.

### 1200 BPS INTEGRATED MODEM

An integrated modem for operation at 1200 bps over non-switched half-duplex or duplex voice grade lines for communication to the CPU through the 3704 or the Communications Adapter (#1601) feature on the 4331 Processor. Note: Integrated modem must communicate with either IBM 3600 FCS Configurator, G9Z-2762. However, facilities at a user's disposal must be able to interface with the 1200 BPS Integrated Modem. Maximum: One. Field Installation: Yes. Prerequisite: IBM SDLC Communications Feature with Clocking (#6301 or #4501). Limitation: Cannot be installed with IBM Interface (#3701).
IBM
DP Machines

3602 Finance Communication Controller (cont'd)

tion Facility with a 1200 BPS Loop Integrated Modem (#8001), or a
3603 as the first attached remote unit in each physical
(geographic) location.

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*Feature prices are based on plant installation.

ATTACHMENT FACTOR FUNCTIONS

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symbol, commas, and periods from the input data are automati­
cally done. In the event that cents were not in the input data,
zero padding is optionally provided. SCALE should significantly
reduce the number of instructions required to process monetary
input.

Segment Indexing (SEXT, TESTX, SETXREG) — provides an alter­
native method of referencing data within a segment. Only
fixed operands of 3600 instructions may be indexed. This func­
tion can be used to reduce the number of SETFPL instruc­
tions executed by the AP, thereby enhancing performance and
reducing AP size. This function also provides a pseudo DSECT
facility, thereby enabling an AP to more readily reference (1)
variably displaced data within segments and/or (2) data beyond
4K bytes from the beginning of a segment.

Branch on Index (BRANX) — provides an index increment, com­
pare and branch function in a single instruction. This instruc­
tion is used to control the number of times a series of AP in­
structions will be executed. Since the instruction algebraically
increments a register, BRANX can be used in conjunction with
the Segment Indexing facility to simplify the processing of ta­les.

Execute (LEXEC) — provides a function similar to the S/370
EXECUTE instruction. The amount of data logically OR-ed into
the target instruction may be 2, 4 or 6 bytes.

Priority Dispatching — provides the ability to specify the order in
which 3601/2 workstations are dispatched. This function con­
sists of the LCHAP instruction which activates or deactivates
the dispatching priority specified in the table(s) generated by
the PRIDSP macro.

Translate — the LTRT instruction processes an input data stream against user specifiable translate table(s) to generate a
translated output data stream. The LTRTBE or LTRTENT and
LTRTGEN instructions assist the user application programmer in
specifying the translate table(s).

Extended Statistical Counter Recording — provides the option to
enhance statistical counter recording facilities to assist in fault
isolation of degraded loop segments. This facility is particularly
useful when a loop consists of multiple remote locations.

Multiple Block I/O - Diskette - permits multiple blocks to be
accessed with a single execution of the LREAD and REPLACE
instruction for permanent file and absolute addressing access­
es. This may also result in enhanced performance when more
than 3 blocks are read or 4 blocks are written.

3602 Dynamic Sector Relocate — this facility provides a means
of recovery when a Write Sector CRC check occurs. This facility,
in most cases, replaces the off line manual procedure which requires a special test diskette to reassign failing sectors.

3270/3600 Datastream Mapping — provides, via four new 3600
assembler language instructions, 3600 controller assistance in
converting 3270 output datastreams into any output datastream
processable by 3600 attached devices, and 3604 input data­
streams into 3270 input datastreams. Additionally, these instruc­
tions can aid in converting 3604 output display datastreams into
3270 output display datastreams. Input and output screen sizes
are supported as specified by the application programmer. The
3270 TAB, CLEAR, PA and PF keys are simulated.

Extended 3270/3600 Keyboard Mapping — provides simulation
of the 3270 INSERT, DELETE, ERASE TO END OF FIELD and
ERASE INPUT keyboard functions.

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IBM 3603 TERMINAL ATTACHMENT UNIT

Purpose: Attaches all 3600 System Controllers and terminals to the communication facilities. The 3603 enables remote subloop operation by connecting the controller loop feature to the communication facilities which connect to a remote 3603 with the sub-loop of terminals.

Model 1 Provides 1200 bps integrated circuitry for attachment to communication facilities and has switched network backup capability for use if the non-switched communication line fails.

Model 2 Provides an EIA RS232C interface to an external asynchronous modem (1200, 2400 bps).

Model Changes: Available at time of manufacture only.

Highlights: Can be physically installed on a wall ... has self test facilities to establish valid operation of the 3603 on a local loop exclusive of the non-switched network.

PREREQUISITES:
The 3603mdl 2 with Clocking (#6352) requires a synchronous modem that accepts transmit signal element timing from the 3600 System controller.

A 3601 or 3602 with an Additional Loop Feature (#4735) is required for each remote loop that is attached with a 3603.

As an alternate to a 3603, a 1200 BPS Loop Integrated Modem (#8001) in the 3601 or 3602 may be used.

Note: The loop is unidirectional. Therefore, if there is only one 3603 attached, there must be a four-wire duplex communication channel interconnecting the 3601/3602 and the 3603. If there is more than one 3603 location attached to a single loop, there must be a two-wire line linking all the 3603s in the loop, plus a two-wire line from the 3601/3602 to the first 3603 and from the last 3603 to the 3601/3602. The 3603 attaches to normal quality voice grade lines. When using a 3603 on a loop it is recommended that a 3603 be used at the 3601/3602 to maximize backup capabilities.

Bibliography: GC20-0370

Customer Responsibilities: The customer must be advised that:

[1] He is responsible to make certain that the use of the equipment complies with all Federal, State, and Local Laws, Regulations, and Ordinances ... [2] He is responsible for price quotations, installation and cost (initial and recurring) of common carrier equipment and service ... [3] He is responsible for set up of the unit ... [4] The customer will determine the failing unit (see "Maintenance" below) ... [5] He is responsible to determine required spares ... [6] Purchaser agrees that IBM is relieved of responsibility for all claims including, but not limited to, loss of funds contained in, dispensed by or associated with the 3603.

The customer is also responsible for the provision of a telephone local loop conditioned for data above 300 bps, and for a CDT Access Arrangement in order to use the Switched Network Backup Function. A cable is available from IBM for a fee, for the DAA attachment. A similar cable is available, also for a fee, to connect the 3603 to the non-switched line connector. Installation of the cable is also a customer responsibility.


Spares: The customer may wish to replace a failing 3603 with a spare and must be advised to purchase sufficient spare units for such use. The number of spare units recommended is dependent upon the number of units the customer has installed, his applications requirements, physical locations, and layouts. However, the minimum number of spare units recommended is shown in the following table:

<table>
<thead>
<tr>
<th>Number of 3603s installed</th>
<th>Minimum Number of Spares Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
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<tr>
<td>100</td>
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<td>4500</td>
<td>33</td>
</tr>
<tr>
<td>5000</td>
<td>36</td>
</tr>
</tbody>
</table>

Maintenance: Maintenance of the 3603 will normally be at a designated IBM Repair Center.

Customers with machines not under an IBM Maintenance Agreement have the option to ship the machines to the designated IBM Repair Center for repair under the IBM Machine Repair Authorization Form, GX27-2991, in which case repair will be made (if the machine is repairable). Alternatively, upon request, IBM will provide, for a minimum charge, an estimate of repair charges. This charge covers handling, inspection, cleaning, adjustments, testing, and estimating of repair charges.

IBM Repair Center Service: The repair service is available under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement at the MMC shown below, or on a time and material basis.

Central Facility Maintenance: IBM will accept requests for special contracts for central facility maintenance (refer to Central Facility Maintenance in the Field Engineering Services subsection of the General Information section of the sales manual.) Under this offering, service will be performed at a repair facility located on customer premises. The customer will continue to be required to determine the failing unit and to transport it to and from the facility.

SPECIFY: Voltage (115 V AC, 1-phase, 60 Hz): #9901.

PRICES: Mdl ATP/ MLC

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SPECIAL FEATURES


ATP/ MLC

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* Pilot Test Plan applies. PTP Purchase Option, 70%

** As specified in the IBM Repair Center Maintenance Supplement.

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3604 KEYBOARD DISPLAY - Model 1

Purpose: A combination keyboard and gas-panel display terminal for input and output in interactive banking applications.

The 3604 mdl 1 displays 240 characters -- six rows of 40 characters. May have numeric and function keys.

Model Changes: Available at time of manufacture only.

Highlights: The 3604 displays up to 153 different characters under programmed control of a 3601 or 3602 Finance Communication Controller. Has a variety of keyboards to meet input requirements ...

Can be equipped to read a magnetic stripe on either a plastic card or a passbook and/or encode a magnetic stripe on a passbook. May be either locally or remotely attached to the 3601 or 3602.

PREREQUISITES:

1) An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.  

2) One keyboard type must be selected to complete the order ...

Repair Center Maintenance: Available ...

Bibliography: GC20-0370


Cables: See M 10000 pages for ordering and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.

Numeric Engraving: For bottom row of engraved numeric keypad (from left to right) -- #9481 for zero, double-zero, triple-zero, #9482 for zero, double-zero, decimal point; or #9483 for zero, triple-zero, decimal point. See "Special Features." Field Installation: Not recommended.

Function/Transaction Key Configuration: For the Function/Transaction keyboard to the right of the engraved numeric section -- #9181 if all individual keys, or #9182 if 3 bottom keys in leftmost column are to be replaced by a single raised "Motorbar" key. See "Special Features." Field Installation: Not recommended.

Prices: Mdl MRC MLC# $   Purchase MMC
3604 1 MC/ 2 Yr  $ 1,095 1,095** 7.05**

Plan Offering: Plan B Maintenance: D Per Call: 1
Purchase Option: 55% Useful Life Category: 2 Warranty: B
Termination Chg Mtns: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0%


MAGNETIC STRIPE CAPABILITY - The 3604 can be equipped with a Magnetic Stripe Reader or a Magnetic Stripe Encoder/Reader which mounts on top of the 3604. To use these features an operator manually passes a magnetic striped plastic identification card or credit card (for reading), or a passbook with a magnetic stripe label attached (for reading or encoding), through the slot. The 3604 encoding is in a unique format at 210 bits per inch. Standard ABA encoding is at 75 bits per inch; therefore, credit cards cannot be encoded to ABA specifications, and thus must be used as "read-only" documents. The 3604 is capable of reading either the standard ABA format or the 3604 passbook format. IBM self-adhesive magnetic stripe labels are available. These mylar base labels are approximately 0.50" (12.7 mm) by 3.6" (91.4 mm) and are easily applied by hand to passbooks.


MAGNETIC STRIPE ENCODER-READER (#4905). Has encode and read capability. Maximum: One. Limitation: Cannot be installed with Magnetic Stripe Reader (#4901). Field Installation: Yes. Prerequisite: Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601 or 3602 ...

SPECIAL FEATURES

KEYBOARDS - all keyboards will have a combination of pre-engraved and non-engraved keytops. Each 3604 will be provided with 3 sets of self-adhesive keytop labels. One set will be pre-printed with commonly-used function nomenclature and will have a protective plastic coating applied. Also, a set of blank labels plus a set of clear plastic overlays for the blank labels will be provided so that the user may create his own labels.

Each keyboard will have an engraved numeric keypad consisting of 15 keys arranged in three columns of five rows. The bottom row of this section will be engraved as specified ... see item [3] under "Specify." The next three rows will be engraved with the digits 1 thru 9. The top row will contain three non-engraved function/transaction keys. All keyboards will also contain at least one function/transaction keypad consisting of non-engraved keys arranged in some number of columns which are 5 keys high.

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3604 KEYBOARD DISPLAY - Model 2

[The 3604 AAS Model Code 002 is no longer available. For New Orders for 3604 AAS Model Code A02, see "3604 Keyboard Display - Models 2, 3, 4." For special features for 3604 AAS Model Code 002, see "Special Features" below.]

Purpose: A combination keyboard and gas-panel display terminal for input and output in interactive banking applications. The 3604 mdl 2 displays 240 characters - six rows of 40 characters. May have an alphabetic, numeric, and function keys. May have an integrated modem.

Model Changes: Available at time of manufacture only.

Highlights: The 3604 displays up to 153 different characters under programmed control of a 3601 or 3602 Finance Communication Controller. Has a variety of keyboards to meet input requirements... see "Special Features."

Can be equipped to read a magnetic stripe on either a plastic card or a passbook and/or encode a magnetic stripe on a passbook.

May be either locally or remotely attached to a 3601 or 3602.

Prerequisites:

1. An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3614 or 3624 with 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.

2. One keyboard type must be selected to complete the order... see "Keyboards" under "Special Features."

3. If either the Numeric Keyboard (#4661) or the Expanded Numeric Keyboard (#4663) is ordered for a 3604 mdl 2, the 3604 mdl 2 must have the Line Feature Base (#4751) installed.

Repair Center Maintenance: Available ... in accordance with the type of the 3604.

Bibliography: GC20-0370


Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.

Numerical Engraving: For bottom row of engraved numeric keypad (from left to right) -- #9481 for zero, double-zero, triple-zero; #9492 for zero, double-zero, decimal point; or #9493 for zero, triple-zero, decimal point. See "Special Features." Field Installation: Not recommended.

Function/Transaction Key Configuration: For the Function/Transaction keyboard to the right of the engraved numeric section. See "Special Features." Field Installation: Not recommended.

Special Features: The following special features apply to the 3604 AAS Model Code 002. For field installation, refer to feature description.

KEYBOARDS -- all keyboards will have a combination of pre-engraved and non-engraved keypads. Each 3604 will be provided with 3 sets of self-adhesive keyboard labels. One set will be pre-printed with commonly-used function nomenclature and will have a protective plastic coating applied. Also, a set of blank labels plus a set of clear plastic overlays for the blank labels will be provided so that the user may create his own labels.

Each keyboard will have an engraved numeric keypad consisting of 15 keys arranged in three columns of five rows. The bottom row of this section will be engraved as specified... see item [3] under "Specify." The next three rows will be engraved with the digits 1 through 0. The top row will contain three non-engraved function/transaction keys. All keyboards will also contain at least one function/transaction keypad consisting of non-engraved keys arranged in some number of columns which are 5 keys high.


MAGNETIC STRIPE CAPABILITY -- see "Special Features" under 3604 Models 2, 3 and 4.


MAGNETIC STRIPE ENCODER-READER (#4905). Has encode and read capability. Maximum: One. Limitation: Cannot be installed with Magnetic Stripe Reader (#4901). Field Installation: Yes. Prerequisite: Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601 or 3602... see M 3601 or M 3602 pages.

MODEMS -- one modem is required at each location which has 3600 Finance Communication System terminals remotely attached to the 3601 or 3602 Finance Communication Controller. The following features provide the required capability in the 3604 Keyboard Display mdl 2.


1200 BPS LOOP INTEGRATED MODEM (#8001). An integrated modem for communications with a remotely located 3601 or 3602 Finance Communication Controller at 1200 bps over unconditioned voice-grade lines. Maximum: One. Limitation: Not required if a 3614 at the same location has a 1200 bps integrated modem. Field Installation: Yes. Prerequisites: Line Feature Base (#4751) on the 3604, and a 1200 bps Loop Integrated Modem (#8001) on an Additional Loop Feature (#4735) on the 3601 or 3602... see M 3601 or M 3602 pages for further details.

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<th>PURCH</th>
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</tr>
</tbody>
</table>

* Repair Center Maintenance Plan.
**SPECIAL FEATURES**

**KEYBOARDS** -- all keyboards will have a combination of pre-engraved and non-engraved keytops. Each 3604 will be provided with 3 sets of self-adhesive keytop labels. One set will be pre-printed with commonly-used function nomenclature and will have a protective plastic coating applied. Also, a set of blank labels will be provided so that the user may create his own labels.

Each keyboard will have an engraved numeric keypad consisting of 15 keys arranged in three columns of five rows. The bottom row of this section will be engraved as specified ... see item [3] under 'Specify.' The next three rows will be engraved with the digits 1 through 9. The top row will contain three non-engraved function/transaction keys. All keyboards will also contain at least one function/transaction keypad consisting of non-engraved keys arranged in some number of columns which is 5 keys high.


**EXPANDED NUMERIC KEYBOARD** ([#4773]). Same as [#4771] plus an additional three-column function/transaction keypad to the left of the engraved numeric keypad. See items [3] and [4] under "Specify": Maximum: One on mdls 2, 3 or 4. Limitation: Cannot be installed with Keyboard ([#4771], 3607, 4773). Field Installation: Not recommended.

**EXPANDED ALPHANUMERIC KEYBOARD** ([#4774]). Sames as [#4772] except that function/transaction keyboard is five columns wide. See items [3] and [4] under "Specify": Maximum: One on mdls 2, 3 or 4. Limitation: Cannot be installed with Keyboard ([#4771], 3607, 4773). Field Installation: Not recommended.

**MAGNETIC STRIPE CAPABILITY** -- the 3604 can be equipped with a Magnetic Stripe Reader or a Magnetic Stripe Encoder/Reader which mounts on top of the 3604. To use these features, an operator manually passes a magnetic stripe plastic identification card or credit card (for reading), or a passbook with a magnetic stripe label attached (for reading or encoding), through a slot. The 3604 encoding is in a unique format at 210 bits per inch. Standard ABA encoding is at 75 bits per inch; therefore, credit cards cannot be encoded to ABA specifications. An additional feature is a magnetic stripe reader which mounts on top of the 3604. Credit cards cannot be encoded to ABA specifications and thus must be used as "read-only" documents. The 3604 is capable of reading either the standard ABA format or the 3604 passbook format. IBM self-adhesive magnetic stripe labels are available.

These mylar base labels are approximately 0.50" (12.7 mm) by 3.8" (91.4 mm) and are easily applied by hand to passbooks.

**MAGNETIC STRIPE READER** ([#4902]). Has read capability only.

**MAGNETIC STRIPE ENCODER-READER** ([#4906]). Has encode and read capability. One modular monzat on top of the 3604. To use these features, an operator manually passes a magnetic stripe plastic identification card or credit card (for reading), or a passbook with a magnetic stripe label attached (for reading or encoding), through a slot. The 3604 encoding is in a unique format at 210 bits per inch. Standard ABA encoding is at 75 bits per inch; therefore, credit cards cannot be encoded to ABA specifications. An additional feature is a magnetic stripe reader which mounts on top of the 3604. Credit cards cannot be encoded to ABA specifications and thus must be used as "read-only" documents. The 3604 is capable of reading either the standard ABA format or the 3604 passbook format. IBM self-adhesive magnetic stripe labels are available.

These mylar base labels are approximately 0.50" (12.7 mm) by 3.8" (91.4 mm) and are easily applied by hand to passbooks.

**MODEMS** ([Models 2, 3 and 4]) -- one modem is required at each location which has 3600 Finance Communication System terminals remotely attached to the 3601 or 3602 Finance Communication Controller. The following features provide the required capability in the 3604 Keyboard Display mdls 2, 3 or 4.

**LINE FEATURE BASE** ([#4752]). Required to operate the 1200 BPS Loop Modem ([#8002]).

**1200 BPS LOOP INTEGRATED MODEM** ([#8002]). An integrated modem for communications with a remotely located 3601 or 3602 Finance Communication Controller. Operates at 1200 bps over unconditioned voice-grade lines. Maximum: One on mdls 2, 3 or 4. Limitation: Not required if the same location has a 1200 bps integrated modem. Field Installation: Yes.

**Prerequisites:** Line Feature Base ([#4752]) on the 3604, and a 1200 bps Loop Modem ([#8002]) on an Additional Loop Feature ([#4735]) on the 3601 or 3602 ... see 3601 or 3602 for further details.
3604 Keyboard Display - Models 5 and 6

Purpose: A combination keyboard and gas-panel display terminal for input and output in interactive banking applications.

Model 5 Displays 120 characters - 3 rows of 40 characters. Includes a 5 x 7 dot matrix alphanumeric keyboard; a 5 x 7 dot matrix expd alphanumeric keyboard; and a 5 x 7 dot matrix expd numeric keyboard for input and output in interactive banking applications.

Model 6 Displays 240 characters - 6 rows of 40 characters. The same 45-key keyboard is available as described above for the Model 6. Model 6 is also used as a control station terminal on a 3631/3632 Plant Communication Controller.

Highlights: The 3604 Keyboard Display md1 displays characters using a 5 x 7 dot matrix. The 3604 md2 displays characters using a 7 x 9 dot matrix.

A 45-key keyboard is standard. It can be equipped with a magnetic stripe decoder or passbook decoder. The keyboard can be programmed to work with any of the programmable indicator lights. Maximum: One. Field Installation: Yes.

Special Features

AUDIBLE ALARM (#1050). The 3604 model 5 or 6 can be equipped with an audible alarm which can be enabled or disabled under program control. The audible alarm can be programmed to work with any of the programmable indicator lights. Maximum: One. Field Installation: Yes.

MAGNETIC STRIPE CAPABILITY -- The 3604 model 5 and 6 can be equipped with a Magnetic Stripe Reader which is located in front of the display panel, to the left of the keyboard, or with a Magnetic Stripe Encoder-Reader attached by a 30 inch cable. To use these features, an operator manually passes a magnetic striped plastic identification card or credit card (for reading), or a passbook with a magnetic stripe label attached (for reading or encoding), through a slot. The 3604 encoding is in a unique format at 210 bits per inch. Standard ABA encoding is at 75 bits per inch; therefore, credit cards cannot be encoded to ABA specifications and must be used as 'read-only' documents. The 3604 is capable of reading either the standard ABA format or the 3604 passbook format. IBM self-adhesive magnetic stripe labels are available. These mylar base labels are approximately 12.7 mm (0.50") by 91.4 mm (3.6") and are easily applied by hand to passbooks.

MAGNETIC STRIPE ENCODER-READER (#1501). Has encode and read capability. Maximum: One on the Model 5 or 6. Limitation: Cannot be installed with Magnetic Stripe Reader (#4903). Cannot be used in a 3630 System. Field Installation: Yes. Prerequisite: Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or Additional Storage Feature (#1006) may be required on the 3602 — see 3601 or 3602.

IB M 3604 ADMINISTRATIVE KEYBOARD
DISPLAY - Model 7

Purpose: A CRT display and keyboard terminal for administrative applications in a 3600 Finance Communication System.

Highlights:
- 1,920 characters are displayed in an 80 row x 24 column format.
- Presents characters within a 7 x 14 character matrix. Displays SNA/SDLC SLU-2 and high/normal intensity.
- Keyboard: A 99-key keyboard, cable attached to the display protected/unprotected, alphameric, displayable/non-displayable, row format.
- Operational Factors: The 3604 mdl 7 CRT is covered by a low-glare screen. On-screen indicators are easily viewed by the operator. Cursor displays are maintained during the display refresh operation, eliminating blinking. Both underscore and reverse video characters are available to the operator, as well as cursor blinking, under function key control. A "Clicker" is also under operator control to provide audible feedback when keying data. Any key up to a maximum of 16 keys (other than "Shift" or "Reset") can be designated as typamatic under program control.
- Security Functions: A Security Keylock (see "Special Features") prevents keyboard entry or display of data in the terminal unless the key is turned to the "On" position.
- Customer Setup: The 3604 mdl 7 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

CSU instructions is shipped with each 3604 mdl 7.

Customer Responsibilities:
- Adequate site, system and other vendor preparation.
- Receipt at the customer's receiving dock, unpacking and placement of the 3604 mdl 7.
- Physical setup, connection of cables in protected customer access areas, switch settings, and checkout.
- Notifying IBM of intent to relocate and following IBM instructions for relocation.
- Using and following the problem determination procedures and filling out the trouble report prior to calling for IBM service.
- Disconnecting, packing, and removal to the customer's shipping dock at time of discontinuance. Appropriate instructions will be provided by IBM.

Prerequisites:
1. An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614/3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#4752) and an appropriate modem, a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4752) and an appropriate modem, or a 3604 with RPQ and an appropriate modem. If both a 3614/3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614/3624 since the Consumer Transaction Facility will often be operating when the 3604 mdl 2, 3 or 4 is not.
2. Depending upon the configuration, the Additional Storage Feature (#1005 or 1006) on the 3601 or the Additional Storage Feature (#1006) on the 3602 may be required ... see 3601 or 3602.

Bibliography: GC20-0370

SPECIFY
- Voltage (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug.
- Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA7-2766.
- Power Cable: If standard 2.8 meter (9 foot) power cable is not desired, specify -- #9511 for 1.8 meter (6 foot) cable, #9512 for 3.7 meter (12 foot), or #9513 for 4.5 meter (15 foot).
- Numeric Keypad Zero Keys [Bottom Three Keys]

Engraved Nomenclature:
- #9481
- #9482
- #9483

PRICES

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Plan Offering: B Maintenance: D Per Call: 1
Purchase Option: 55% Warranty: B Useful Life Category: 2
Termination Charge Months: 6 Termination Charge Percent: 20% Upper Limit Percent: 5%
Pilot Test Plan Purchase Option: 70%

SPECIAL FEATURES

AUDIBLE ALARM (#1090). An alarm (short tone), sounded under program control, in conjunction with the programmable indicators, to alert the operator to special conditions. Adjustable volume. Alarm sounds when any of the four programmable indicators are set. Maximum: One. Field Installation: Yes.

SECURITY KEYLOCK (#6340). A physical keylock, located on the display enclosure, used to limit use of the terminal to authorized users. In the 'secure' position, the display is blanked and the keyboard is disabled. Maximum: One. Field Installation: Yes.

Audible Alarm #1090 $2 $90 $350
Security Keylock 6340 35SUC 35 N/C

AUDIBLE ALARM

- #1090
- Pilot Test

3604 Mdl 7

| Mdl/Feature | Pilot Test | 6 Mos. | 3 Mos.
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IBM 3606 Financial Services Terminal

Purpose: A keyboard display terminal for use with the 3600 Finance Communication System in point of sale or other applications.

Model 1 - Attaches to the 3601 or 3602 Finance Communication Controller local or remote loop. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem.

Model 2 - Attaches to the 3601 or 3602 Finance Communication Controller remote loop.

Model Changes: Available at time of manufacture only.

Highlight: Has 8 position numeric display, 9 message indicators, a numeric keyboard, 6 function keys and a magnetic stripe reader capable of reading either standard ABA format (75 bpi) or the 3604 passbook format (210 bpi).

Used as an interactive terminal in point of sale and other applications for authorization, data capture, check verification, funds transfer(s).

Requirements:

Model 1 - If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 and 4 is not.

Model 2 - common carrier carrier termination at location of installation.

Bibliography: GC20-0370

Customer Responsibilities: The customer must be advised that:

[1] He is responsible to make certain that the use of the equipment complies with all Federal, State, and Local Laws, Regulations, and Ordinances...

[2] He is responsible for price quotations, installation and cost (initial and recurring) of common carrier equipment and service...

[3] He is responsible for the set-up of the unit...

[4] The customer will determine the failing unit (see "Maintenance" below)...

[5] He is responsible to determine required spares...

[6] Purchaser agrees that IBM is relieved of responsibility for all claims including, but not limited to, loss of funds contained in, dispensed by or associated with the 3606.

Spare: The customer may wish to replace a failing 3606 with a spare and must be advised to purchase sufficient spare units by model for such use. The number of spare units recommended is dependent upon the number of units the customer has installed, his application requirements, physical locations, and layouts. However, the minimum number of spare units recommended is shown in the following table:

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</tr>
<tr>
<td>4000</td>
<td>24</td>
</tr>
<tr>
<td>4500</td>
<td>26</td>
</tr>
<tr>
<td>5000</td>
<td>29</td>
</tr>
</tbody>
</table>

Maintenance: All maintenance of the 3606, parts replacement, and repair shall normally be performed at the designated IBM Repair Center.

Customers with machines not under an IBM Maintenance Agreement have the option to ship the machines to the designated IBM Repair Center for repair under the IBM Machine Repair Authorization Form, GX27-2981, in which case repair will be made (if the machine is repairable). Alternatively, upon request, IBM will provide, for a minimum charge, an estimate of repair charges. This charge covers handling, inspection, cleaning, adjustments, testing, and estimating of repair charges.

IBM Repair Center Service: Th repair service is available under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement at the MMMC shown below, or on a time and material basis.

Central Facility Maintenance: IBM will accept requests for special contracts for central facility maintenance

Under this offering, service will be performed at a repair facility located on customer premises. The customer will continue to be required to determine the failing unit and to transport it to and from the facility.


[3] Terminals are shipped with standard keyboard and indicator light nomenclature unless specified as follows: #9031 -- for a blank filter panel, or #9481 -- for a numeric-only keyboard overlay. The customer may choose the nomenclature to suit an application. See Financial Services Terminals Complementing Manual, GC27-0002. All keyboard overlays and filter panels are also available for a fee. See "3600 Accessories" in M 10000 pages for pricing and ordering instructions.

[4] Keyboard Arrangement: Specify #9390 for a reverse or calculator formatted keyboard (top row -- 7, 8, 9; second row -- 4, 5, 6; third row -- 1, 2, 3; 0 in bottom row.) If #9390 is not specified, the standard keyboard arrangement will be shipped (top row -- 1, 2, 3; second row -- 4, 5, 6; third row -- 7, 8, 9; 0 in bottom row). Field Installation: Not recommended.

<table>
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<th>ATP/ MLC</th>
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<td>3606</td>
<td>$26</td>
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<td>2</td>
<td>$39</td>
<td>1,125*</td>
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</table>

Plan Offering: Plan B

Warranty: B**

Useful Life Category: 2

Termination Chg Percent: 20%

* Pilot Test Plan applies. PTP Purchase Order,706.

** As specified in the IBM Repair Center Maintenance Supplement.

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3608 PRINTING FINANCIAL SERVICES TERMINAL

Purpose: A keyboard display terminal, with printer, for use with the 3600 Finance Communication System in point of sale or other applications.

Model 1: Attaches to the 3601 or 3602 Finance Communication Controller local or remote loop. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 model 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and an appropriate modem.

Model 2: Attaches to the 3601 or 3602 Finance Communication Controller remote loop.

Model Changes: Available at time of manufacture only.

Highlights:
- Can print three lines of alphanumeric data on sales slips, charge receipts, or other documents used in point of sale applications. Line positions must be specified ... see "Special Features."
- Has 45 character set. Optional 10 character numeric OCR 7B font for uppermost print row is available as a special feature ... see "Special Features."
- Document to be printed is inserted into the chute at the right side of the terminal, is fed past print wheels, printed, and ejected at the left side of the terminal.
- Has position numeric display, 9 message indicators, a numeric keyboard, 6 function keys, and a magnetic stripe reader capable of reading either standard ABA format (76 bpi) or the 3604 passbook format (210 bpi).
- Used as an interactive terminal in point of sale and other applications (credit authorization, data capture, check verification, funds transfers).

Prerequisites:

Model 1: if located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 model 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 model 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 model 2, 3 or 4 is not.

Model 2: common carrier termination at location of installation.

Bibliography: GC20-0370

Customer Responsibilities: The customer must be advised that: [1] He is responsible to make certain that the use of the equipment complies with all Federal, State, and Local Laws, Regulations, and Ordinances ... [2] He is responsible for price quotations, installation and cost (initial and recurring) of common carrier equipment and service ... [3] He is responsible for set-up of the unit ... [4] The customer will determine the failing unit (see "Maintenance" below) ... [5] He is responsible to determine required spares ... [6] Purchaser agrees that IBM is relieved of responsibility for all claims including, but not limited to, loss of funds associated with the 3608.

Spares: The customer may wish to replace a failing 3608 with a spare and be advised to purchase sufficient spare units by model for such use. The number of spare units recommended is dependent upon the number of units the customer has installed, his application requirements, and layouts. However, the minimum number of spare units recommended is shown in the following table:

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Keyboard Arrangement: Specify #9390 for a reverse or calculator formatted keyboard (top row -- 7, 8, 9; second row -- 4, 5, 6; third row -- 1, 2, 3; 0 in bottom row.) If #9390 is not specified, the standard keyboard arrangement will be shipped (top row -- 1, 2, 3; second row -- 4, 5, 6; third row -- 7, 8, 9; 0 in bottom row). Field Installation: Not recommended.

Document Chute: #9701 ... for a document chute capable of handling documents up to 88.9mm (3.5") in height. This feature shifts the print line positions up so that the distance from the bottom of the form to the nominal center location of the print line is increased by 3.5mm (.125"). It is only available with 4, 7, 10 print line positions (#9544) ... see Line Position Chart B. It is not available with OCR 7B Font (#5454). Field Installation: Available at time of manufacture only.

Line Position Chart A [Standard 82.6mm (3.25") Chute]

<table>
<thead>
<tr>
<th>Line Pos</th>
<th>Font</th>
<th>Nominal Center Line Location, distance from bottom edge of document</th>
</tr>
</thead>
<tbody>
<tr>
<td>OCR</td>
<td>OCR 7B</td>
<td>77.0mm (3.03&quot;) from top edge of 82.6mm (3.25&quot;) document</td>
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</table>

<table>
<thead>
<tr>
<th>OCR</th>
<th>OCR 7B</th>
<th>Available as Special Feature (#5454) only</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10-pitch</td>
<td>77.0mm (3.03&quot;)</td>
</tr>
<tr>
<td>2</td>
<td>10-pitch</td>
<td>71.9mm (2.83&quot;)</td>
</tr>
<tr>
<td>3</td>
<td>10-pitch</td>
<td>66.8mm (2.63&quot;)</td>
</tr>
<tr>
<td>4</td>
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<td>61.7mm (2.43&quot;)</td>
</tr>
<tr>
<td>5</td>
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<td>56.7mm (2.33&quot;)</td>
</tr>
<tr>
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<td>10-pitch</td>
<td>51.6mm (2.03&quot;)</td>
</tr>
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<td>10-pitch</td>
<td>46.5mm (1.83&quot;)</td>
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<tr>
<td>8</td>
<td>10-pitch</td>
<td>41.4mm (1.63&quot;)</td>
</tr>
<tr>
<td>9</td>
<td>10-pitch</td>
<td>36.3mm (1.43&quot;)</td>
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<td>10-pitch</td>
<td>31.3mm (1.23&quot;)</td>
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<table>
<thead>
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<td></td>
<td>Not with #5454</td>
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<td></td>
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<td>Not with #5454</td>
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<td></td>
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Line Position Chart B [88.9mm (3.5") chute only ... see #9701 above]

<table>
<thead>
<tr>
<th>Line Pos</th>
<th>Font</th>
<th>Nominal Center Line Location, distance from bottom edge of document</th>
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</thead>
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<tr>
<td>4</td>
<td>10-pitch</td>
<td>64.9mm (2.556&quot;)</td>
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<td>49.7mm (1.956&quot;)</td>
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<td>10</td>
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<table>
<thead>
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<tr>
<td></td>
<td></td>
<td>Only with #5454</td>
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</tbody>
</table>

OCR 7B Font (#5454). The 10-character OCR 7B font can be substituted for the standard font in the uppermost print row. The 3 print line positions, when this feature is installed, are OCR, 3 and 5. The OCR 7B characters impact printed when #5454 is used can be read on a 1287 Optical Character Reader equipped with OCR 7B special feature (#3945). Field Installation: Available at time of manufacture only.

SPECIAL FEATURES

OCR 7B Font (#5454). The 10-character OCR 7B font can be substituted for the standard font in the uppermost print row. The 3 print line positions, when this feature is installed, are OCR, 3 and 5. The OCR 7B characters impact printed when #5454 is used can be read on a 1287 Optical Character Reader equipped with OCR 7B special feature (#3945). Field Installation: Available at time of manufacture only.

* Pilot Test applies: PTP Option Percent, 70%  
** As specified in the IBM Repair Center Maintenance Supplement.
Purpose: A printer for use with the 3600 Finance Communication System to provide a hard-copy output of banking transactions.

Model 1 Prints on a cut form.
Model 2 Prints on a cut form and on a journal/audit roll.
Model 3 Prints on a cut form and on continuous fanfold paper.

Model Changes: Available at time of manufacture only.

Highlights: The 3610 printer provides for a hard-copy output on a variety of cut forms and paper stock to meet the customer's printing requirement in banking applications. When combined with a 3604 Keyboard Display, the 3610 provides a bank teller with a work station to use in performing banking transactions. The 3610 printer can also be used alone for administrative printing of required reports. A document-handling device provides the capability to print on cut forms. The forms can be those usually used for printing of one line or a number of lines. When a single-line document is used, a lever is provided to engage a document stop which positions the center line of the printed line 13/16" ± 1/16" (20.6 mm ± 1.6 mm) from the bottom of the document. The lever is disengaged when the teller wishes to insert the document further into the printer. Printing occurs at 10 characters/inch and 5 or 6 lines/inch. At time of installation, the FE Customer Engineer will set line spacing at 5 LPI or 6 LPI as requested by the customer. Speed ranges from 15 cps to 30 cps ... see "Special Features."

Model 1 - has the capability of printing single or multiple lines on a cut form inserted in the document chute.

Model 2 - has the capability of printing on a one-part or two-part journal roll, which can be used to maintain an audit trail of banking transactions. A cut form can be positioned in front of the journal so that printing can occur simultaneously on the cut form and journal roll, provided that appropriate carbon or impact paper is used.

Model 3 - contains a pin feed platen assembly which allows printing to occur on continuous fanfold paper stock. A cut form can be placed in front of the continuous form so that printing can occur simultaneously on both documents with the appropriate carbon or impact paper.

PREQUISITES:
[1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.

[2] Selection of print speed ... see "Special Features."

[3] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see M 3601 or M 3602 pages.


Bibliography: GC20-0370


---

Model 2

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For new orders, see below:

Prices:

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<td>80</td>
<td>2,545</td>
<td>22.50†</td>
<td>MMMC</td>
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</table>


Special Features:

JOURNAL TAKEUP WITH LOCKED COVER (#4651). [Mdl 2 only] Provides a takeup roll on which the printed journal can be taken up after it has been printed. If two-part paper is used, one part may be put on the takeup roll, and the original can exit past a tear bar. A locked cover is also provided over the takeup roll to prevent unauthorized access to the journal roll. Two keys are provided. Maximum: One. Field Installation: Yes.

SHARED TERMINAL (#6350). Provides two pushbuttons each labeled, START PRINT. These pushbuttons provide teller identification to the 3601 or 3602 Finance Communication Controller when two tellers are sharing one printer. Maximum: One. Field Installation: Yes.

*** 15 CPS WITH 64 CHARACTER SET (#6900, #6903). [#6901 for mdl 2 ... #6903 for mdl 1 and 3] Provides a 64 character set consisting of 63 printable graphics and space (blank). Maximum: One. Limitation: Cannot be installed with #6901 or #6904. Field Installation: Available at time of manufacture only.

*** UP TO 30 CPS WITH 96 CHARACTER SET (#6901, #6904). [#6901 for mdl 2 ... #6904 for mdl 1 and 3] Provides a 96 character set consisting of 95 printable graphics and space (blank). Field Installation: Available at time of manufacture only. Maximum: One. Limitation: Cannot be installed with #6900 or #6903.

*** Either #6900 or #6901, or #6903 or #6904 must be selected to complete the machine order.

Special Feature Prices:

3610 mdl 1 and 3 for billing purposes only

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<td></td>
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<td>15 CPS w 64 Char Set</td>
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<td>15</td>
<td>6.00†</td>
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<tr>
<td>6</td>
<td>Up to 30 CPS with 96</td>
<td>Character Set</td>
<td>6904</td>
<td>26</td>
<td>848</td>
<td>10.00†</td>
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</table>

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450). -- mdl 3 only -- permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

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3610 DOCUMENT PRINTER - Model 4

Purpose: A printer for use with the 3600 Finance Communication System to provide a hardcopy output of banking transactions. The 3610 mdl 4 prints on a cut form and on a journal roll/audit roll.

Model Changes: Available at time of manufacture only.

Highlights: The 3610 Document Printer mdl 4 provides a hardcopy output on a variety of cut forms and paper stock to meet the customer’s printing requirements in banking applications. In addition, the 3610 mdl 4 has the capability of printing single or multiple lines as well as being able to print on a one or two part journal roll. When a single line document is used, a lever is provided to engage a document stop which positions the center of the printed line 812” ± .062” (20.625 ± 1.675 mm) from the bottom of the document. A cut form can be positioned in front of the journal roll so that printing can occur simultaneously on the cut form and journal roll, provided that appropriate carbon or impact paper is used.

Printing occurs at 10 characters per inch, and 5 or 6 lines per inch. At time of installation the customer engineer will set the line spacing at 5 or 6 lines per inch as requested by the customer. The 3610 mdl 4 prints at speeds up to 30 characters/sec. Forms control capabilities include a right-hand forms-advance knob, and a forms tear bar located 2.625” ± .25” (66.675 mm ± 6.35 mm) above the print line. When one part of the journal paper is attached to the take-up roll, the forms-advance knob may be used to advance the paper. Otherwise, the paper must be advanced manually.

The size of the 3610 mdl 4 is 10.5” (266.7 mm) high x 18.0” (457.2 mm) wide x 3602, (266.7 mm) deep. When used with the 3604 Keyboard Display mdl 5 or 6 it provides a teller with a work station which fits within a work area with dimensions of 10.5” (266.7 mm) high x 18.0” (457.2 mm) deep.

Journal Take-up With Locked Cover -- provides a journal take-up roll for accumulating one part of a two-part journal after it is printed. (The other part of the journal exits from the printer past a tear bar.) A locked cover is also provided to prevent unauthorized access to the take-up roll. Two keys are provided for the lock. the journal take-up roll can accommodate only up to a maximum of 15.24M (50 feet) of paper.

48 Character Set -- provides a 48 character set consisting of 47 printable graphics and space (blank).

PREREQUISITES: (1) An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624, since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.

(2) Depending upon the configuration, the Additional Storage Feature (#1005/1006) may be required on the 3601/3602 ... see 3601/3602.

Bibliography: GC20-0370

Forms Specifications: Refer to Form Design Reference Guide for Printers, GA24-3489.


Prices:

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<thead>
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<tr>
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</tbody>
</table>

Plan Offering: Plan B
Per Call: 1
Warranty: B
Termination Charge Months: 6
Termination Charge Percent: 20%
Upper Limit Percent: 5%

** Pilot Test Plan applies. FTP Purchase Option, 70%

SPECIAL FEATURES

SHARED TERMINAL (#6350). Provides two pushbuttons for teller identification to the 3601/3602 Finance Communication Controller when two tellers are sharing one printer. Maximum: One.

Limitation: Cannot be installed with the Address Sharing RPQ (MG1586). Field Installation: Yes.

ATP/ MLC  Purchase MMMC

Shared Terminal #6350 $27SUC $27 NC

Not to be reproduced without written permission.
Purpose: A printer used in the 3600 Finance Communication System to print on horizontal fold or vertical fold passbooks or on single or multiple part cut forms.

Model 1: No longer available

Model 2: Prints on passbooks and cut forms.

Model Changes: Not recommended for field installation.

Highlights: The 3611 printer provides the capability of printing on a variety of passbooks and forms to meet customer's requirements in banking applications.

The 3611 is a physically compact unit with a flat top suited for banking applications.

Passbook specifications for both models are the same as for the 3612 passbook printers. Passbook and forms printing occurs at 12 characters/inch and may be at 5 or 6 lines/inch, with up to an amount of space.

Model 2 -- prints on a horizontal fold or a vertical fold passbook. Variable size, single or multipart documents can be printed in the passbook chute. The size of document which can be accommodated is determined by the width of the passbook to which the passbook chute is adjusted. The maximum document width is equal to 1/2 the passbook width plus 4.35" (110 mm).

PREREQUISITES:

[1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7320) and an appropriate modem, or a 3604 mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.

[2] Selection of print speed ... see "Special Features."

[3] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3602 ... see M 3601 or M 3602 pages.

Forms Specifications: Refer to Form Design Reference Guide for Printers, GA24-3438.

Bibliography: GC20-0370


[3] Short Page Passbooks: #9650 -- provides a passbook stop position for passbooks with short pages, cutouts, notches or windows. Optional stop position required when the distance between the edge of the short pages, cutouts, notches or windows and the leading edge of the passbook cover is between .360" (9.14 mm) and .657" (16.7 mm). Field Installation: Not recommended.

Prices: For Model 2 for billing purposes only

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For Model 2 -- New Orders

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<td>$119</td>
<td>$101</td>
<td>$3,030</td>
<td>$20.00</td>
<td></td>
</tr>
</tbody>
</table>

Plan Offering: Plan B
Not to be reproduced without written permission.

Special Feature Prices:

** Pilot Test Plan applies. PTP Purchase Option, 70%.
Purpose: A printer used in the 3600 Communication System to print on a variety of forms, documents, and passbooks.

Model 1 Prints on a horizontal-fold or vertical-fold passbook and on a cut form.

Model 2 Prints on a horizontal-fold or vertical-fold passbook, on a cut form, and on a journal/audit roll.

Model 3 Prints on a horizontal-fold or vertical-fold passbook, on a cut form, and on continuous fanfold paper.

Model Changes: Available at time of manufacture only.

Highlights: The 3612 printer provides the capability of printing on a variety of forms and passbooks to meet the customer's requirements in banking applications. This printer, when combined with a 3604 Keyboard Display, provides a full-function work station for handling the wide range of banking transactions through the incorporation of two independent print mechanisms. A document-handling device provides the capability to print on cut forms. The forms can be those usually used for printing of one line or number of lines. When a single-line document is used, a lever is provided to engage a document stop which positions the center line of the printed line 13/16 ± 1/16 inch (20.6 ± 1.6 mm) from the bottom of the document. The lever is disengaged when the customer wishes to insert the document further into the printer. Passbooks are inserted in the bottom half of the printer while cut forms/documents may be inserted in the top half. With this facility, the printer is able to print on the passbook and print on the cut forms. Forms printing occurs at 10 characters per inch and 5 or 6 lines per inch. A maximum of 80 characters may be printed across an 8 inch (200 mm) line. The capability to print a single line on a document that is inserted in the cut form chute is provided. Passbook printing occurs at 12 characters per inch and 5 or 6 lines per inch with up to an 8.3 inch (211 mm) line print line of 100 characters. At time of installation, the FE Customer Engineer will set line spacing to 5 LPI or 6 LPI as requested by the customer. NOTE: Only one print element (either passbook or cut form) prints at a time. Both must be selected with the same print speed.

Model 1 – prints on a passbook and has the capability of printing single or multiple lines on a document inserted in the document chute.

Model 2 – prints on a passbook and has the capability of printing on a one-part or two-part journal roll, which can be used to maintain an audit trail of bank transactions. A cut form can be positioned on the front of the journal so that printing can occur simultaneously on the cut form and journal roll, provided that appropriate carbon or impact paper is used.

Model 3 – prints on a passbook and contains a pin feed platen assembly that allows printing to occur on continuous fanfold paper stock. A cut form can be placed in front of the continuous form so that printing can occur simultaneously on both documents with the appropriate carbon or impact paper.

NOTE: Passbook unit (as opposed to forms printing unit) is 12 pitch with an 8.3 inch (211 mm) line print line of 100 characters for all models.

PREREQUISITES:

1. An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614 or 3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 md1 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and a 3604 md1 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 md1 2, 3 or 4 is not.

2. Selection of print speed ... see "Special Features."

3. Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see M 3601 or M 3602 pages.

Forms Specifications: Refer to Form Design Reference Guide For Printers, GA24-3498.

Bibliography: GC20-0370


[3] Short Page Passbooks: #9650 — provides a passbook stop position for passbooks with useful features such as punches, notches, or windows. Optional stop position required when the distance between the edge of short pages, etc., and the leading edge of the passbook cover is between .360 inches (9.14 mm) and .657 inches (16.7 mm). Field Installation: Not recommended.

Prices: — 3612

Model 1 Mdl AAS MAC/ MLC
1 001 $106** $ 90** $2,885 $16.00

Model 2 and 3 (for billing purposes only)

Model 1 Mdl AAS MAC/ MLC
1 001 $106** $ 90** $3,050 $16.00

Model 2 and 3 (for billing purposes only)

Model 1 Mdl AAS MAC/ MLC
1 001 $106** $ 90** $3,050 $16.00

Special Features

JOURNAL TAKEUP WITH LOCKED COVER (4651, 4652) [Mdl 2 only] (4651 – for 3612 AAS Model Code 002 ... 4652 – for 3612 AAS Model Code A02) Provides a paper roll on which one or both parts of the printed journal can be taken up after it has been printed. If two-part journal paper is used, one part may be taken up on the takeup roll, while the original can exit past a tear bar. A locked cover is also provided over the takeup roll to prevent unauthorized access to the journal roll. Two keys are provided. Maximum: One. Field Installation: Yes.

SHARED TERMINAL (4650). Provides two pushbuttons, labeled START PRINT. These pushbuttons provide teller identification to the 3601 or 3602 Finance Communication Controller when two tellers are sharing one printer. Maximum: One. Field Installation: Yes.

15 CPS WITH 64 CHARACTER SET (#9000, #9001, #9003) — for mdl 1 and for billing purposes only on mdls 2 and 3 ... #9003 — for new orders on mdls 2 and 3. Provides a 64 character set consisting of 63 printable graphics and space (blank). Maximum: One. Limitation: Cannot be installed with #9001 or #9004. Field Installation: Available at time of manufacture only.

UP TO 30 CPS WITH 96 CHARACTER SET (#9001, #9004, #9009) [9001 — for mdl 1 and for billing purposes only on mdls 2 and 3 ... #9004 — for new orders on mdls 2 and 3) Provides a 96 character set consisting of 95 printable graphics and space (blank). Maximum: One. Limitation: Cannot be installed with #9000 or #9003. Field Installation: Available at time of manufacture only.

Either #9001 or #9002, or #9004 or #9005 must be selected to complete the machine order. The selected speed applies to both print units, passbook and forms.
DP Machines
3612 Passbook and Document Printer  (cont'd)

Special Feature Prices:
For Mdl 1 (and mdls 2 and 3 for billing purposes only)

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For Mdls 2 and 3 – New Orders

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<tr>
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<td>62</td>
<td>53</td>
<td>1,695</td>
<td>26.00</td>
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</tbody>
</table>

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 pages for additional information and field installation.

FORMS STAND (#4450). (Mdl 3 only) Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

** Effective July 1, 1977, orders for the 3612 mdl 1 will be accepted by IBM on a Purchase Only basis.
IBM 3614 CONSUMER TRANSACTION FACILITY

Purpose: An unattended self-service banking terminal that issues variable amounts of money, accepts deposits, performs other transactions, and attaches to a 3601 or 3602 Finance Communication Controller or directly to any virtual storage 5/370 or 4300 Processor via a 3704/3705 Communications Controller, or the Communications Adapter feature on the 4331 ... see 3704/3705 or 433.

Model 1 Consumer Transaction Facility, Lobby. Designed for use inside a building. Consists of the basic unit with protective covers, a protective front panel, and a bezel around the front panel. The protective cover contains provision for customer insertion of two keylock cylinders.

Model 2 Consumer Transaction Facility, Through the Wall. Designed for use through the wall of a building. Has a motorized protective door over the keyboard/guidance area for outdoor environmental protection. Can be attached to a heavy duty enclosure, through-the-wall bezel, and mounted on a 4", 7" or 10" high mounting stand. The heavy duty enclosure contains a combination lock and provision for customer insertion of bank examiner's type keylock for locking the combination dial.

Model 11 Same as Model 1 with a capability of issuing two denominations during one transaction. Can also be loaded with a single denomination, doubling the bill capacity currently available in the 3614 mdl 1.

Model 12 Same as Model 2 with a capability of issuing two denominations during one transaction. Also can be loaded with a single denomination, doubling the bill capacity currently available in the 3614 mdl 2.

Model Changes: Available at time of manufacture only.

Highlights:

Issues Cash — withdrawal transaction issues single (mdl 1 or 2) or dual denominations (mdl 11 or 12) up to a maximum of 20 bills from a single account. Withdrawal is from a choice of four accounts.

Accepts Deposits — deposit transaction and depository with controlled access slot allows users to deposit to checking or savings account.

Accepts Payments — allows user to make various payments by depositing cash or check. User may also deposit payment coupon and have financial institution deduct funds from the user's account.

Cash Check — a single transaction that allows cash to be issued to user following deposit of a check drawn on another institution.

Additional Transactions — the 3614 also provides a general purpose special transaction, an account inquiry transaction, and a funds transfer transaction.

Transaction Chaining — a series of multiple transactions can be performed with a single insertion of magnetic stripe card and single keyed entry of personal identification number.

Issues Statements — can print and issue a statement or message to user.

Journaling — transaction documents can be printed and retained in the 3614, as an aid in machine balancing.

3704/3705 Attachment — can attach via communications link directly to a 3704 or 3705 Communications Controller.

Communications Adapter Attachment — can attach via communications link directly to a 4331 Processor with a Communications Adapter feature.

Keyboard/Guidance — guidance display steps user through a transaction. Customer can specify messages to be displayed.

Encrypt/Decrypt Feature — encryption/decryption of sensitive data during communication line transmission ... provision for one of two encryption algorithms: the proposed U.S. Federal Information Processing Data Encryption Standard (DES) or the original 3614 Alternate Encryption Technique (AET) ... see "Specify."

Multi-Institution Usage — provision to accept magnetic stripe cards for 50 different card issuer identifiers with Data Encryption Standard (DES) technique.

Off-Host Operation — offline operation via a 3601 or 3602 controller possible.

Customizing Capacity — customer can customize terminal operation (within limits) and change guidance messages.

Identification — the user is identified through the reading of his ABA-standard magnetic stripe card. As a second check, the user is identified by a comparison of a keyed personal identification number.

Installation — can be installed for use inside the building or through-the-wall for outside use.

Bill Issue — issues bills directly. No packets or cartridges are used.

Heavy Duty Enclosure: A strong steel protective enclosure to protect bills ... available for purchase on mdl 2 or 12 ... see M 10000 pages.

Logo Panel: A personalization panel in front of the 3614 for financial institution advertising. Available for purchase on mdl 1, 2, 11 or 12 ... see M 10000 pages.

PREREQUISITES:

[1] Each 3614 must have loop attachment to a 3601/3602, or SDLC attachment to S/370 via a 3704/3705.

For Attachment to a 3601/3602 there must be an available position on a local loop or remote loop of 3601/3602. The 3614 must have Terminal Loop Feature (#7820) ... if located remotely from the 3601/3602, the remote location must have a 3614/3624 with Loop Integrated Modem (#8001), a 3604 mdl 2, 3 or 4 with Line Feature Base (#4751 or 4752) and appropriate modem, or a 3603 Terminal Attachment Unit. If a 3603 is at the remote location, the 3614 or 3624 does not require Loop Integrated Modem (#8001). If both a 3614 or 3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location without a 3603, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 might often be operating when the 3604 is not, e.g., weekends, holidays.

For attachment to a S/370 or 4300 Processor with virtual storage capability via a 3704/3705 Communications Controller equipped with appropriate features, or the Communications Adapter on a 4331, see 3704, 3705 and 4331. The 3614 must have SDLC Communications Feature With Clocking (#6301) or SDLC Communications Feature Without Clocking (#6302).

[2] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.

[3] Logo Panel (#9401 or #9402 ... see "Specify." Purchase Only.

[4] The 3614 mdl 2 and 12 require Model 2/12 Accessory Group #9571 ... see "Specify." Purchase Only.

Bibliography: GC20-0370

Specify: [1] Voltage (AC, 1-phase, 60 Hz): #9901 for 115 V.


[4] Keyboard: Specify one of the following. All are field installable.
When 1st position (#9701, 9703, 9801 or 9803) is specified, also specify one of the following to indicate magnetic tape density (media) used at the host system location:
- #9412 9-track 800 bpi
- #9413 9-track 1600 bpi
- #9414 9-track 8250 bpi
If magnetic tape is not used at the host system location, select one of the following media [DOS/VS users only]:
- #9431 80 column cards
- #9432 96 column cards

In order to apply 3601, 3602, or 3614 controller-data code from cards, it is necessary to have applied an Independent Component Release (ICR) to Subsystem Support Services (SSS) in DOS/VS Release 31.

[8] Specify one of the following:

DES: #9001 — provides the data encryption technique (DES) proposed as a U.S. Federal Information Processing Data Processing Standard by the U.S. National Bureau of Standards. DES facilitates multi-institution usage by providing for personal identification number (PIN) validation based on individual issuer PIN encryption keys for 50 different card issuer identifiers. PIN offset value may be recorded on magnetic stripe to be used to validate PINs in 3614 which were not based originally on DES technique... accepts 4 to 16 digit fixed or variable length PINs... option to load PIN encryption keys via communication line from host. Field Installation: Yes. Limitation: Cannot be specified if #9002 is specified.

AET: #9002 — provides the Alternate Encryption Technique (AET) which is the original 3614 encryption technique. Limitation: May not be specified if #9001 is specified.

Prerequisite: DES and/or AET encryption capability required on the 3601 or 3602 and in host system... see 3601 and 3602 in 'Machines.' DES and AET are used to determine 3614 Host 1st and 2nd Position Host Attachment designation... see item [7] above.

Customer Responsibilities: Because the 3614 mdl 2 and 12 attach to a customer premise, installation of cables, mounting stand and enclosure and bezel are a customer responsibility. The customer is also responsible for site preparation, such as cutting a hole in the wall for mounting the 3614 mdl 2 or 12. Installation of cables and site preparation is also a customer responsibility for the 3614 mdl 1 and 11. IBM is not responsible for any loss of money incurred through the use of the 3614.

Sub host operation under control of the 3601 or 3602 Finance Communication Controller requires special customer systems design and support. Maintenance of system integrity in the sub host mode is a customer responsibility.

IBM is not responsible for intentional damage to the 3614 mdls 1, 2, 11 or 12. Repair of such damage is not covered under the IBM Rental Agreement or Maintenance Contract. Repair of such damage at cost of time and materials will be made to rental machines and can be provided for purchase machines.

Customer Responsibilities - Currency Sorting: The general condition of used currency may vary. To achieve satisfactory operation, the customer must ensure that only GOOD QUALITY used currency is loaded into the 3614. Used or recirculated currency must be inspected to remove excessively worn, damaged or torn notes. The 3614 Operator's Guide, GA66-0001 contains procedures for preparation of new currencies and inspection of used currencies for loading the 3614. For the 3614 mdl 11 and 12 the customer must ensure that each hopper is loaded with the proper denomination currency.
3614 Consumer Transaction Facility (cont'd)

**ETP/ MAC/ MLLC**

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Plan Offering: Plan B  Machine Group: D
Per Call: 1 Purchase Option: 55% Warranty: B
Useful Life Category: L Term. Charge Months: 5
Term. Charge Percent: 25% Upper Limit Percent: 0%

**SPECIAL FEATURES**

**DEPOSITORY** (#3322). Provides a controlled access slot in the front of the 3614 leading to an internal deposit receptacle for the collection of deposit documents. In addition to the controlled access slot, the chute is designed to discourage tampering with previously inserted deposits. Field Installation: Yes. Prerequisite: One of the following keyboards — #9357, #9358, #9359, #9457, #9458, or #9460.

**EIA INTERFACE** (#3701). Provides an interface for external modems. Limitation: Not available on Terminal Loop Feature (#7820). Field Installation: Yes. Prerequisite: SDLC Communications Feature.

**EXPANDED FUNCTION FEATURE** (#3895). Provides the options of transaction chaining, journal printing, and cash check transactions. Limitation: Yes... any of the individual communications may be field installed. Prerequisite: DES (specify code #9001).

**SDLC COMMUNICATIONS WITH CLOCKING** (#6301). Provides communications capability to communicate with the same 96-column card stock as available from IBM Corporation, Commercial Development Office, Armonk, N.Y. Card configurations or card stocks which do not conform to these specifications may result in unsatisfactory performance. Field Installation: Yes.

**TERMINAL LOOP FEATURE** (#7820). Provides the capability to attach either to a local or remote 3601/3602 Finance Communication Controller loop directly; or to a remote 3601/3602 loop via a 3604 or 3604 md1, 3 or 4, or a 3624 with 1200 BPS Loop Integrated Modem (#8001). Prerequisites: (1) Availabe positions on the loop. (2) Depending on the the configuration, the Additional Storage Feature (#1005 MLA #1006) may be required on the 3601/3602. See M3601 or M3602 pages... (3) Attachment to remote 3601/3602 loop directly requires a 1200 BPS Loop Integrated Modem (#8001). Specify: If loop attachment is without Loop Integrated Modem (#8001), specify one of the following loop speeds: (1) For local loop attachment to 3601/3602, specify local loop speed: #9062 for 1200 bps, #9063 for 2400 bps, or #9064 for 4800 bps... (a) For remote loop attachment via a 3603, 3604 md1, 2, 3 or 4, or #9364, specify loop speed: #9062 for 1200 bps. Limitations: (1) Cannot be ordered with SDLC Communications with Clocking (#6301) or SDLC Communications without Clocking (#3620)... (2) Remote loop speed is 1200 bps. Maximum: One. Field Installation: Yes.

**TRANSACTION STATEMENT PRINTER** (#7900). Prints a statement showing the record of the transaction and passes the printed statement to the customer through the cash issue slot. Data is printed on 96-column card stock (2-5/8" by 3-1/4"). A 57 character set is provided consisting of 56 printable graphics and a space (blank). Four lines, one character per line, are printed simultaneously, for up to 34 characters per line... a total of 136 characters on each statement. The data to be printed is determined by the host application program and by the data stored in the 3614. Printing is overlapped with the cash issue cycle and the user deposit cycle. Prerequisite: If a statement is to be issued for any transaction on a given keyboard, then the Transaction Statement Feature is required. Card Limitations: The 96-column card stock used in the transaction statement printer must not have the optional 60 degree corner cuts. Detailed disclosure specifications describing the 96-column card stock are available from IBM Corporation, Commercial Development Office, Armonk, N.Y.

**IBM 1200 BPS INTEGRATED MODEM** (#5500). Provides an integrated 1200 bps modem for use with leased voice grade lines; see M 2700 pages. This modem is for a point-to-point or tributary SDLC station. Note: This integrated modem must communicate with the IBM 1200 BPS Integrated Modem (#5500) or 4-wire strapping, or #9652 for 2-wire strapping. Field Installation: Yes. Prerequisite: SDLC Communications Feature with Clocking (#6301).

**SDLC COMMUNICATIONS FEATURE WITH CLOCKING** (#6301). Provides communications capability to communicate with the same 96-column card stock as available from IBM Corporation, Commercial Development Office, Armonk, N.Y. Card configurations or card stocks which do not conform to these specifications may result in unsatisfactory performance. Field Installation: Yes. Transmission: This feature operates over common carrier provided or equivalent customer owned communications facilities. For information concerning these facilities, see M 2700 pages.

**SDLC COMMUNICATIONS FEATURE WITHOUT CLOCKING** (#6302). Provides communications capability to communicate with any virtual storage S/370 Processor (except 3115), or any 4300 Processor via a 3704/3705... see 3704, 3705. Attachment is also possible via the Communications Adapter feature on the 4331 or #9451. For attachment to communications lines through an external modem which does have internal clocking. Limitations: Cannot be installed with Terminal Loop Feature (#7820) or SDLC Communications Feature with Clocking (#6301). Field Installation: Yes. Prerequisite: EIA Interface (#3701). Transmission: This feature operates over common carrier provided or equivalent customer owned facilities. For information concerning these facilities, see M 2700 pages. Modems: External modems operating at up to 4800 bps may be attached.... IBM 3603 Modem... IBM 3604 Modem... IBM 3874 Modem...
IBM 3615 ADMINISTRATIVE TERMINAL PRINTER

Purpose: A printer for use with the 3600 Finance Communication System to provide a hard-copy output of banking transactions.

Model 1 Prints at 60 cps (local or remote loops)
Model 2 Prints at 120 cps (local loops only)

Model Changes: Available at time of manufacture only.

Highlights:
The 3615 provides a hard copy output on a variety of cut forms and fan-fold continuous forms to meet the customer's printing requirement in banking applications. When combined with a 3604 Keyboard Display, the 3615 provides a bank teller or officer with a workstation to use in performing banking administrative transactions. The 3615 can also be used alone for administrative printing of required reports. The forms can be those usually used for printing of one line or a number of lines. Speed ranges from 60 cps for the Model 1 to 120 cps for the Model 2. This microprocessor controlled printer is a bi-directional matrix printer with high speed tabulation (Model 1 only) and indexing capability. The printer's dot matrix is 4 of 7 wide by 8 high. The 3615 prints up to 132 print positions with character spacing at 10 to the inch. Line spacing is 6 lines to the inch. Up to 6-part forms (total thickness -- 0.018") may be used. Five and six part forms should be tried on an individual basis for acceptable feeding registration and print quality. For continuous fan-fold forms, the Variable Width Forms Tractor (#8700) is required ...

Prerequisites:
1) An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location needs either a 3603 Terminal Attachment Unit, a 3614/3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 Keyboard Display mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or 4752) and an appropriate modem. If both a 3614/3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614/3624 since the 3614/3624 will often be operating when the 3604 mdl 2, 3 or 4 is not.

2) Depending upon the configuration, the Additional Storage Feature (#1005 or 1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.

Forms Specifications: Refer to Form Design Reference Guide for Printers, GA24-3488.

Bibliography: GC20-0370

Supplies: A black ribbon, Part No. 1136653, or equivalent is required.

SPECIFY
- Voltage (115V AC, 1-phase, 60 Hz) : #9880 for locking plug, or #9881 for non-lock plug. Field Installation: Not recommended.

PRICES:

<table>
<thead>
<tr>
<th>Mdl</th>
<th>5 Yr</th>
<th>Purchase</th>
<th>MMC</th>
<th>MLC</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>$160</td>
<td>$3,485</td>
<td>$28</td>
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</tr>
<tr>
<td>2</td>
<td>186</td>
<td>3,825</td>
<td>38</td>
<td></td>
</tr>
</tbody>
</table>

Machine Group: D Per Call: 1 Purchase Option: 55%
Termination Charge Months: 6 Termination Charge Percent: 20%
Upper Limit Percent: 5% Warranty: B Useful Life Category: 2

SPECIAL FEATURES

VARIABLE WIDTH FORMS TRACTOR (#8700). A forms feeding device for continuous edge-punched fan-fold forms. Overall forms widths from 3 to 15 inches can be fed. This feature is required for use of continuous forms. Friction fed cut forms may also be used without removing the forms tractor. In this case, printing is limited to 127 print positions. Field Installation: Yes.

Special Feature Prices:

<table>
<thead>
<tr>
<th></th>
<th>MLC</th>
<th>5 Yr</th>
<th>Purchase</th>
<th>MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vrbl Wdth Forms Trctr #8700</td>
<td>$5</td>
<td>$160</td>
<td>1.00</td>
<td></td>
</tr>
</tbody>
</table>

ACCESSORIES: The following item is available on a purchase-only basis.

FORMS STAND (#4450). Permits feeding of continuous forms from the carton and provides for stacking after printing.

* Pilot Test Plan applies: FTP Option Percent, 70%
Purpose: A matrix printer used on the 3600 Finance Communication System to print on passbooks, journals, and a variety of forms and documents.

Highlights

The 3616 printer provides the ability to print on a variety of forms and passbooks to meet printing requirements of financial applications. This printer, when combined with a 3604 Keyboard Display, provides a teller or other operator with a full function workstation capable of handling a wide range of financial transactions. The printer is a bi-directional matrix printer with a maximum print speed of 120 cps. The printer dot matrix is 4 of 7 wide by 8 high.

The printer has two separate print stations serviced by one print head. The passbook print station can print up to 100 characters on passbooks or single or multipart cutforms requiring single or multi-line printing. The basic machine accepts horizontal fold passbooks of a variety of sizes. Print spacing and line indexing are both program selectable, spacing at 10 or 12 characters per inch, indexing at 5 or 6 lines per inch. Note: For the Vertical Fold Passbook feature (#8701) limitations, see Forms Design Reference Guide, GA24-3488.

The journal print station prints up to 57 characters on a one part journal, with a locked internal take-up roll. Journal entries are visible after the entire line is printed, and remain visible for several entries thereafter. The journal may be manually advanced, but not reversed. Cutforms may be inserted in front of the journal for validation type printing of one line of print in a fixed location on the lower left-hand corner of the document. Print spacing is program selectable at 10 or 12 characters per inch. Journal indexing is nominally 6 lines per inch.

In either station, wide bold characters may be printed at 6 characters per inch. The customer may define and use up to 16 special characters, addressable separately from the basic character set, by defining their matrix patterns at CPGEN.

The printer has 8 operator status lights, including 3 user program-mable. The machine has two separate "Start" pushbuttons which may be used to identify individual tellers to the 3600 controller when two tellers are sharing the printer.

The 3616 provides address sharing between like devices. That is, two 3616s can share the same loop allocation on a contention basis.

Prerequisites:

1. An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614/3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 Keyboard Display mdl 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and an appropriate modem. If both a 3614/3624 and a 3604 mdl 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614/3624 since the Consumer Transaction Facility may be operating when the 3604 mdl 2, 3 or 4 is not.

2. Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.

Forms Specifications: Refer to the Forms Design Reference Guide for Printers, GA24-3486.

Supplies: A black ribbon, Part No. 7034365, or equivalent, is required

Bibliography: GC20-0370

SPECIFY

- Voltage (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug.
- Cables: See M 10000 pages for pricing and ordering instructions. Also see Installation Manual - Physical Planning, GA27-2766.
- Journal Security Feature: #9351. Provides a change in the covers so that a cutform cannot be inserted in front of the journal.

| Mdl | 5 Yr | Purchase* | AMMC/ MMC
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<tr>
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<td>1</td>
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<td>$4,700</td>
</tr>
</tbody>
</table>


**SPECIAL FEATURES **

VERTICAL FOLD PASSBOOK (#8701). Provides modifications to the basic machine to enable it to accept a single size of vertical fold passbook in the passbook station. The size is adjustable by the CE at initial installation. For details and limitations, see Forms Design Reference Guide, GA24-3488. Maximum: One. Field Installation: Available at time of manufacture only.

<table>
<thead>
<tr>
<th>Mdl</th>
<th>5Yr</th>
<th>Purchase</th>
<th>AMMC/ MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vertical Fold Passbook #8701</td>
<td>$3</td>
<td>$100</td>
<td>NC</td>
</tr>
</tbody>
</table>

G 3616
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* Pilot Test Plan applies ... PTP Option Percent. 70%

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Highlights: Provides the capability to print on continuous fanfold paper up to 80 print positions on an 8 inch (200 mm) print line. The unit has a pin feed mechanism. It accepts paper widths of 3.5 inches (89 mm) to 9 inches (229 mm) pin hole center-to-center. Paper up to 14.875 inches (378 mm) can be handled with Expanded Print Line (#3860) ... see "Special Features." Paper up to six parts plus carbon [maximum total thickness is .02 inches (5 mm)] can be accommodated. A form jam detection capability is provided. Print speeds are dependent upon the number of characters printed per line, loop speed, and available slot position on the loop.

Character Set    Nominal Print Speeds
48       155 lpm
64       120 lpm
96       80 lpm

PREREQUISITES:
[1] An available position on a local or remote loop of a 3601 or 3602. If located remotely from the 3601 or 3602, the remote location must have either a 3603 Terminal Attachment Unit, a 3614/3624 Consumer Transaction Facility equipped with a Terminal Loop Feature (#7820) and an appropriate modem, or a 3604 mod 2, 3 or 4 equipped with a Line Feature Base (#4751 or #4752) and appropriate modem. If both a 3614 or 3624 and 3604 mod 2, 3 or 4 are installed in the same remote location, it is recommended that the loop modem be located with the 3614 or 3624 since the 3614 or 3624 will often be operating when the 3604 mod 2, 3 or 4 is not.

[2] Depending upon the configuration, the Additional Storage Feature (#1005 or #1006) may be required on the 3601, or the Additional Storage Feature (#1006) may be required on the 3602 ... see M 3601 or M 3602 pages.


Bibliography: GC20-0370


[3] Character Set Size: #9071 for 48 characters, #9072 for 64, or #9073 for 96. A space (blank) character is included in each character set, resulting in 47, 63 or 95 printable graphics. Field Installation: Not recommended.

ETP/ MRC MMC
Prices: Mdl 2 Yr Purchase MMC
3618 1 $ 293 $ 249 $10,600 $53.50

Plan Offering: Plan B Per Call: 1 Machine Group: D
Purchase Option: 55% Useful Life Category: 2 Warranty: B
Termination Chg Mths: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES
DUAL INDEPENDENT FORMS FEED (#3550). Provides two independently indexed pin feed mechanisms. Different sizes of forms can be handled in each paper feed. Maximum: One. Field Installation: Not recommended.

EXPANDED PRINT LINE (#3860). Expands the print line to 132 print positions on a 13.2 inch (33.5 cm) line. Maximum: One. Field Installation: Not recommended.

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 pages for additional information and field installation.

FORMS STAND (#4450). permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

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IBM 3624 CONSUMER TRANSACTION FACILITY

Purpose: An unattended walk-in service banking terminal that issues variable amounts of money, accepts deposits, and performs other financial transactions ... other documents such as traveler’s checks may be dispensed if they complete a document issue qualification test successfully and are authorized by a 3601 or 3602 System Controller. Communication is also possible via the Communications Adapter (ACF/VTAM) and other devices such as traveler’s checks and other documents as separate transactions (e.g., cash and traveler’s checks). A personalized check is available as a purchase accessory to mount the basic lobby model. A pedestal base is included as part of the depository special feature when the depository is added to the basic model.

Model 1 - Single Document Feed Mechanism. For use inside a building in a secure attended location. The basic model includes a single cartridge feed station, card reader, user guidance keyboard and display unit, and has provision for mounting the currency dispensing and depository mechanisms inside a heavy-duty security enclosure. Covers are provided for the components not contained within the heavy-duty enclosure. A heavy-duty enclosure, pedestal base for mounting the enclosure, through-the-wall bezel, front trim paneling, and logo panel, for through-the-wall installation, are available as purchase accessories.

Model 2 - Through the Wall - Single Document Feed Mechanism. For outdoor, vestibule, drive-up, and otherwise less secure, unattended locations to provide availability on a 24-hour basis. The basic model includes a single cartridge feed station, card reader, user guidance keyboard and display unit, and has provision for mounting the currency dispensing and depository mechanisms inside a heavy-duty security enclosure. Covers are provided for the components not contained within the heavy-duty enclosure. A heavy-duty enclosure, pedestal base for mounting the enclosure, through-the-wall bezel, front trim paneling, and logo panel, for through-the-wall installation, are available as purchase accessories.

Model 11 - Same as the model 1, but with dual document feed mechanism. Provides capability to issue the same or two different denominations in a single transaction; to load the same denomination in both dispensers, effectively doubling the bill capacity of a single denomination 3624 model 1; or to issue currency and other documents as separate transactions (e.g., cash and traveler’s checks).

Model 12 - Same as the model 2, but with dual document feed mechanism. Provides capability to issue the same or two different denominations in a single transaction; to load the same denomination in both dispensers, effectively doubling the bill capacity of a single denomination 3624 model 2; or to issue currency and other documents as separate transactions (e.g., cash and traveler’s checks).

Model Changes: Available at time of manufacture only.

Highlights

Cartridge Loading - currency cartridge provides for quick, easy loading and convenient, tamper-resistant transportation of the currency.

Issues Cash - issues one denomination (mdls 11 and 12) up to the capacity of 20 bills, or two denominations (mdls 11 and 12) up to the capacity of 20 bills from a choice of accounts. Issues all bills at one time in a single stack ... no prepackaging or packets are used.

Individual Document-Feed Control - allows each cartridge drive station on the dual-feed models 11 and 12 to be associated with a separate transaction select key (e.g., cash and traveler’s checks).

Accepts Deposits - allows user to deposit a choice of accounts. Built-in depository envelope holder available as an accessory on models 11 and 12. Envelope holder included with depository on mdls 1 and 11.

Cash-Check - a single transaction that allows cash to be issued to user, following deposit of a check.

Accepts Payments - allows user to make various payments by depositing cash or check or by having funds deducted from user’s account.

Depository Card Locking System - depository cartridge and locking mechanism prevents removal of cartridge from machine unless cartridge is closed and locked ... reduces need for dual-custody depository servicing.

Depository Envelope Printer - a special feature which prints unit and sequence number on envelope as it is deposited.

Additional Transactions - provides account balance inquiry, funds transfer transaction, and other transactions as separate transactions (e.g., cash and traveler’s checks).

Keyboard/Guidance - comprehensive set of function keys and customized display messages allows user to perform a single transaction ... keyboard and transaction functions can be modified through programming. Option for either numeric or alphanumeric keypad.

Multiline Display - a special feature which provides 240-character, 6-line display. Includes additional display-related user-response capability for expanded interaction between user and machine.

Transaction Chaining - allows user to perform a series of transactions with a single insertion of the magnetic stripe card.

Transaction Statements - can print and issue individual statements or messages to user.

Journaling - can print and retain documents within the 3624.

Backlighted Logo - backlighted logo panel that can be customized, extending across entire width of the front panel.

Host/Subhost Attachment - allows attachment to the host processor either directly via SDLC or through subhost 3601/3602 via loop communications ... off-host operation at 3601/3602 is possible.

Encrypt/Decrypt - encryption of sensitive data for communication line transmission ... uses the U.S. Federal Information Processing Standard (FIPS-46) algorithm.

Multi-institution Usage - provision to accept magnetic Stripe cards of many different card issuers. Base capacity of issuer identifier table within the 3624 can be expanded by table overflow request message to host with Additional Storage Feature (‘#1301) ... "Special Features."

Personal Identification - user account is identified through reading magnetic stripe card. To validate the identity of the person using the card, a personal identification number (PIN) is used ... validation of PIN (up to 16 digits) may be performed in the 3624 and/or host/subhost support system.

Installation Configurations - can be installed inside a building, for lobby use; or through-the-wall of a building, for walk-up or drive-up use.

Multilingual Languages - capability to display different languages based on identifier code recorded on magnetic stripe card.

Third Track - a special feature provides reading and writing third track data recorded on magnetic stripe card ... see "Special Features."

Additional Storage - special feature(s) provide additional memory for expanding the number of custom messages and Financial Institution Table entries ... see "Special Features."

Modular Packaging - for model 2 or 12 through-the-wall installation. Currency dispenser and depository mechanism are contained in a heavy-duty enclosure independent of other functional modules.

Compatibility - 3614 family compatibility, designed to minimize transition requirements.

Security - models 2 and 12 installed with heavy-duty enclosure and through-the-wall installation accessories meet security requirements of UL291 and comply with the intent of U.S. Federal Regulation P for unattended automated paying and receiving machines used when banking offices are closed.

Installation Units and Accessories - Heavy-duty enclosure, through-the-wall bezel, optional pedestal base, front dress panel and front trim border are required for installation of through-the-wall models 2 and 12 ... these are available as purchase only accessories, see "Accessories."

Walk-up Configuration - recessed through-the-wall bezel, designed to provide a shelf surface for the user, is recommended for walk-up use.

Drive-up Configuration - non-recessed through-the-wall bezel, designed to position the user area nearer the outer wall surface, is recommended for drive-up use. A pedestal for mounting lobby models 1 and 11 is available as an optional purchase only accessory ... see "Accessories."

A logo panel and cartridges are required for installation of all models and are available as purchase accessories ... see "Accessories."

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3624 Consumer Transaction Facility (cont'd)  

PREREQUISITIES

[1] Each 3624 must be either loop attached to a 3601/3602 or direct attached to a virtual storage S/370 or 4300 Processor via SDLC communications through a 3704/3705 Communications Controller. Also attaches via a Communications Adapter (#1601) on a 4331 Processor.

For Loop Attachment to a 3601/3602: There must be an available position on a local or remote loop of the 3601/3602. The 3624 must have Term Loop Feature (#7820). If located remotely from the 3601/3602, the 3624 can be attached to a remote loop via any of the following: [1] Directly, using the 1200 BPS Loop Integrated Modem (#8001). [2] Via a subloop through a 3603 Terminal Attachment Unit mdl 1 (for 1200 bps or a 3632 mdl 1 for 1200 bps) or a 3632 mdl 2 for 2400 bps. [3] Via subloop through a 3604 Keyboard and Display mdl 2, 3 or 4 equipped with Line Feature Base (#4751 or #4782) and an appropriate modem. [4] Via a subloop through a 3614 equipped (Integrated Loop Feature (#7820) and 1200 BPS Loop Integrated Modem (#8001)). [5] Via a subloop through another 3624 equipped with Terminal Loop Feature (#7820) and 1200 BPS Loop Integrated Modem (#8001). Note: The 3624 does not require #8001 if it is attached to a remote loop via a subloop through a 3603, 3604, 3614, or 3624, or if the 3624 is attached to a local loop. It is recommended that the 3624 be not be attached through a 3604, as the 3624 might often be operating while the 3604 is not, e.g., weekends and holidays.

For Direct Attachment to a Virtual Storage S/370 or 4300 Processor: The 3704/3705 Communications Controller equipped with appropriate features to communicate with the 3624 via SDLC or the Communications Adapter (#1601) on a 4331 (Note: The 3624 is not supported by NCZ/VTAM). See 3704, 3705 or Communications Adapter (#1601) on the 4331. The 3624 must have an SDLC Communications Feature (#6301 or #6302).

[2] Encryption modules BQKDES and BQKDPRS are required with 3600 Host Support Independent Release program ... see Guide for Ordering Programs for feature number use. To order these modules on the 3600 Host Support IR. Source listings are not orderable for, nor supplied with, these modules. Customers should be informed of this fact before the 3624 is ordered.

[3] Depending upon the configuration, Additional Storage Feature (#1005 or #1006) may be required on the 3601, or Additional Storage Feature (#1006) may be required on the 3602 ... see 3601 or 3602.

[4] For 3624 mdl 1 and 11: Pedestal, Lobby (#5510) is available as an option for free-standing lobby configuration without a depository feature ... see "Accessories," which are not available only. Note: A pedestal is included with the Depository, Lobby feature (#3233, #3293).

[5] For 3624 mdl 2 and 12: The following units are required for through-the-wall installation: (1) Heavy-duty Enclosure, through-the-wall bezel, front trim border, and logo panel are customer responsibilities. The keylock mechanism can be field modified to a dual function keylock. Non-Recessed Bezel (1481) is recommended for drive-up configuration ... (3) Front Dress Panel (#3651) ... (4) Front Trim Border, with Envelope Holder (#3691) or without Envelope Holder (#3692) ... (5) Pedestal for single function heavy duty enclosure (#4901) ... (6) Dual function heavy duty enclosure (#4900) is optional for mounting heavy duty enclosure at appropriate height for walk-up or drive-up. Storage cabinet (#4903) is optional when mounting dual function heavy-duty enclosure without pedestal. Note: Storage cabinet is included with Pedestal (#4901 or #4902). The "Accessories" and M 10000 pages for descriptions and ordering information. These accessories are for purchase only.

[6] Logo Panel -- required on all 3624 models. Shipments of the logo panel is determined by the following specify codes: (1) #4901 if panel is to be shipped with the 3624. (2) #9402 if panel(s) are to be shipped prior to the 3624. Note: Specify feature #9402 can be used to order more than one panel if the customer desires to have the several panels delivered before the 3624 (e.g., for customization at one time). (3) #9403 if panel is not to be ordered with the 3624 as it will either be ordered separately by part number ordered under specify code #9402 on another 3624 ... see "Specify" and "Accessories." Purchase only.

[7] Currency Cartridge -- For 3624 mdls 1 and 2: One is required. For 3624 mdls 11 and 12: Two are required. Currency cartridges are not included with the basic 3624 and must be ordered separately. Spare cartridges are recommended for convenience of operation. A minimum of one spare cartridge for mdls 1 and 2, and two spare cartridges for mdls 11 and 12 must be made available by the customer to the CE for normal 3624 maintenance and testing. See "Customer Responsibilities - 3624 Currency Cartridge" in M 10000 pages for installation and maintenance requirements.

Customer Responsibilities

Installation Facilities -- because the 3624 mdl 2 or 12 attaches to customer premises, installation of cables, pedestal, heavy-duty through-the-wall bezel, through-the-wall logo, front trim border, and logo panel are customer responsibilities. The customer is also responsible for site preparation, such as cutting a hole in the wall, providing any screw holes needed, and also for placement of the document feed and depository modules into the heavy-duty enclosure and attachment of the I/O module to the heavy-duty enclosure. Installation of cables and site preparation are customer responsibilities also, for 3624 lobby mdls 1 and 11. The customer is responsible for installation of the Currency Area Lockoff accessory.

Machine Maintenance -- IBM will not provide warranty or maintenance service on a 3624 containing money. The customer will be responsible for removing, controlling and reloading all money in the 3624 so that IBM can fulfill its warranty and maintenance obligations.

Keylocks -- covers included with lobby mdls 11 and 11 have a lockable handle, with a standard key, and provide for customer installation of an additional keylock cylinder. Covers included with through-the-wall mdls 2 and 12 have a keylock cylinder, with a standard key. Cabinet doors, included in all pedestals, have a keylock cylinder with a standard key. Keylock mechanism can be field modified to a dual function keylock. All customer responsibility must be for the keylock cylinder and its key. The customer must be responsible for the correct selection of the lock system and the associated keying system. Keylock mechanism in the 3624 is not supported by S/370 or 3601/3602.

Accessories Maintenance -- the customer is responsible for maintenance and parts procurement on all accessories. Repair of the currency issue and depository slot protective environmental gates in the heavy-duty enclosure can be provided by IBM on a time and material basis.

Currency Cartridge -- the 3624 Currency Cartridge is a purchase only accessory and is not included with the basic 3624. One cartridge is necessary for mdls 1 and 2, and two for mdls 11 and 12 for installation check and operation of the 3624. Models 2 and 12 may also be operated with a single cartridge. Cartridges are not maintained by IBM under the normal lease agreement or MMMC for a purchased machine. The customer is responsible for determining if the cartridge is the falling unit, for procurement of 3624 cartridge for CE 3624 maintenance and testing (a minimum of one spare cartridge for mdls 1 and 2 and two for mdls 11 and 12 must be made available by the customer to the CE for normal 3624 maintenance and testing so that the desired stock of currency of the cartridges and drive stations so that there is the desired stock of currency to denote to drive station ... see "Customer Responsibilities - 3624 Currency Cartridge" in M 10000 pages for installation and maintenance requirements.

Currency Sorting -- to achieve satisfactory operation, the customer must ensure that only new currency and good-quality used currency are used in the 3624. The general condition of used currency may vary. Used currency must be inspected to remove excessively worn, damaged, or torn bills. The IBM 3624 Operator's Guide, GA66-0006 and IBM 3624 Cartridge Owner's Manual, GA66-0029, contain procedures for preparation of new currency and inspection of used currency for operation in the 3624. For the 3624 mdls 11 and 12, the customer must ensure that each feed mechanism is loaded with the proper denomination currency. The cartridges contain a keying mechanism which can be set by the customer to ensure a match between specific cartridges and cartridge drive stations.

Printer Ink Rolls -- the customer is responsible for procurement and replacement of ink rolls in transaction statement and depository printers.

Logo Lamp -- the customer is responsible for procurement and replacement of the lamp in the logo panel light assembly.

Damage -- IBM is not responsible for intentional damage to the 3624 or any 3624 accessories. Repair of such damage is not covered under the IBM Maintenance Contract, Lease Agreement or under the Pilot Test Plan. Repair of damage caused by time and materials will be provided for leased machines, Pilot Test machines, and purchase machines.

System Integrity -- subhost operation, under control of the

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3624 Consumer Transaction Facility (cont’d)

3600 Finance Communication Controller, requires customer systems design and support. Maintenance of system integrity in the subhost is a customer responsibility.

IBM is not responsible for any loss of money to the financial institution or its customers through the use of the 3624.

Third Track System Security Statement — customers ordering the Third Track feature (#7950) must be advised that:

"IBM believes that the system security is optimized in an online environment, where PIN validation and transaction authorization can be performed in conjunction with positive-file data bases. The scope of security exposure expands with the degree of offline implementation, for which the Third Track might be used. The U.S. Federal Information Processing Data Encryption Standard (DES) algorithm is utilized to provide cryptographic security in the 3624 and may be used in conjunction with the third track application. IBM recommends that the customer consider using DES for this purpose. An optional security feature of the proposed ANSI/ISO Third Track Data Content standard is a Crypto Check Digits validation and transaction pose. An optional security feature of the proposed

Bibliography: GC20-0370

SPECIFY

• Voltage (120V, AC, 1-phase, 60Hz): #9911 ... usable on 115V.
• Cabling: Refer to Installation Manual-Physical Planning, GA27-
  2766 and GA26-1658. Also see M 10000 pages for pricing and ordering instructions.
• Keyboard Arrangement: #9301 for numeric-only keypad, or
  #9302 for alphanumeric keypad ... alphanumeric arrangement is the basic touch-pad telephone format with the Q and Z added over the numeric "0".
• Currency Cartridge: See M 10000 pages for ordering instructions and prices.
• Currency Denomination: #9091 for 5, 10, 20 dollar.
• Keyboard: Specify one of the following for standard keyboard ... an RPQ should be submitted for any keyboard not shown below. All are field installable. The Change key allows the user to request a change in the denomination mix to be issued on midas 11 and 12. The Change key is used also, on all models, to page displays with the Multiline Display feature (#4750).

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Notes

(1) Key position does not appear on the keyboard panel; single function is selected automatically.

(2) Prerequisite: Depository #3233, 3234, 3243 or 3244.

(3) Prerequisite: Depository #3233, 3234, 3243 or 3244 if any Special transactions are customized to require a deposit step.

• Logo Panel Group: Specify one of the following: #9401 if logo panel is to be shipped with 3624 ... #9402 if logo panel(s) is to be shipped prior to the 3624 ... #9403 if logo panel is not to be ordered with 3624 and will either be ordered separately by part number or has been ordered through #9402 on another 3624. Note: More than one panel may be ordered on specify code #9402 if customer desires to have several panels delivered before the 3624 (e.g., for customization at one time). Purchase only. See M 10000 pages for prices and order information.

• Controller-Data Designation: 1st and 2nd position designation is required to control distribution and maintenance of controller-data media necessary for 3624 load images. Specify #9491 or #9492 as follows:
  1st Position Designator (#9491). Used to determine which controller-data set is to be distributed to the host-system location. One 3624 attached to a host-system processor is specified #9491.
  2nd Position Designator (#9492). Used to identify additional 3624s attached to host-system ... controller-data set media are not distributed to host-system location for any 2nd position designated 3624s.
When 1st position (#9491) is specified, also specify one of the following:
  If magnetic tape is used at the host-system location:
    #9412 9-track, 800 bpi
    #9413 9-track, 1600 bpi
    #9414 9-track, 2500 bpi
  If magnetic tape is not used at the host-system location (DOS/VS users only):
    #9431 80 column cards
    #9432 96 column cards

When 1st position (#9491) is specified, additional information is required to determine the shipping address of the controller-data media.

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This is the address to which controller-data media will be automatically shipped after first 3624 is ordered.

Changes to 1st Position Designators for On-order and Installed 3624. If a 1st position (#9491) 3624 is deleted, cancelled, or discontinued and 2nd position (#9492) 3624s have been specified, then 1st position 3624 must remain at 1st position (from #9492 to #9491) to ensure continued distribution of controller-data media to the host system location. When altering a 3624 to 1st position, include all items as required to be specified when #9491 is specified (items specified on previous 1st position 3624) ... if the host system location changes the input medium (e.g., from 1600 bpi to 2650 bpi tape), the media specify code must be changed on the 3624 with #9491 specified. In this case, the former media specify code must be deleted and the new one added.

ADDITIONAL STORAGE ENVELOPE
either:
additional storage features required, see slot Multiline Display port is designed to discourage tampering with previously inserted door and standard key, and a built-in depository envelope holder.

DEPOSITORY,
inside the 3624. The depository DEPOSITORY controlled Deposit envelopes may vary in size from 3.5" x 6.0". PrerequiSite: Storage Expansion Feature (#6501) is required for either: 1) first Add1 Storage Feature (#1301) increment when ordered with Multiline Display (#4750) and SDLC Communications Feature (#6301 or #6302), or 2) third Additional Storage Feature (#1301) increment when ordered with Multiline Display (#4750) and Terminal Loop Feature (#7820). Maximum: Two if without Multiline Display (#4750) ... five if with #4750. Field Installation: Yes.

DEPOSITORY, LOBBY (#3233). [Models 1 and 11 only] Provides envelope transport mechanism leading from a controlled access slot to deposit receptacle inside the 3624. The envelope transport is designed to discourage tampering with previously inserted deposits. Includes a pedestal stand, with lockable rear access door and standard key, and a built-in depository holder.

DEPOSITORY, THROUGH-THE-WALL (#3243). [Models 2 and 12 only] Provides envelope transport mechanism leading from a controlled access slot in the security enclosure to deposit receptacle inside the 3624. In addition to the controlled access slot in the security enclosure, the depository transport is designed to discourage tampering with previously inserted deposits. Deposit envelopes may vary in size from 3.5" x 6.0" (88.9mm x 152.4mm) to 4.5" x 9.75" (114.3mm x 247.7mm) and shall be constructed of paper having basic weight of sub 20 through sub 28. Maximum thickness of a deposit envelope and its contents is 0.5" (12.7mm). Limitation: Cannot be installed in Pedestal, Lobby (#5510). Maximum: One. Field Installation: Yes.

DEPOSITORY, THROUGH-THE-WALL (#3243). [Models 2 and 12 only] Provides envelope transport mechanism leading from a controlled access slot in the security enclosure to deposit receptacle inside the 3624. In addition to the controlled access slot in the security enclosure, the depository transport is designed to discourage tampering with previously inserted deposits. Deposit envelopes may vary in size from 3.5" x 6.0" (88.9mm x 152.4mm) to 4.5" x 9.75" (114.3mm x 247.7mm) and shall be constructed of paper having basic weight of sub 20 through sub 28. Maximum thickness of a deposit envelope and its contents is 0.5" (12.7mm). Limitation: Cannot be installed in Heavy-Duty Enclosure, Single Function (#3901). Maximum: One. Field Installation: Yes. Note: Field installation requires that Heavy-Duty Enclosure, Dual Function (#3902) has been initially ordered.

DEPOSITORY PRINTER (#3245). Prints sequence number on envelope as it passes through the depository throat. Six numeric digits are printed horizontally at repeats intervals along the envelope. Three digits are set by the customer engineer to identify the unit, and three digits are automatically sequenced when envelope passes print station. The depository ink roll is IBM Part No. 457149. It is the customer's responsibility to purchase and replace the ink roll when required. Prerequisite: Depository, Lobby (#3233) or Depository, Through-the-Wall (#3243). Maximum: One. Field Installation: Yes.

DEPOSITORY CARTRIDGE LOCKING FEATURE (#3150). [Models 2 and 12 only] Provides locking mechanism in the depository that prevents removal of the depository cartridge if it is closed and locked. Operates with Deposition (#1355). ... see 'Accessories' and M 10000 pages for purchase of cartridge.

Maximum: One. Field Installation: Yes. Prerequisites: Depository, Through-the-Wall (#3243). Maximum of one Deposition Cartridge (#3155) is required for operation.

EIA INTERFACE (#3701). Provides the appropriate cables and interface logic necessary to attach an external modem for communications attachment to the S/370 or 4300 Processor via SDLC through a 3704/3705 Communications Controller, or the Communications Adapter (#1601) on a 4331 Processor. Non-IBM modems may be attached subject to the Multiple Suppliers System Policy. Prerequisite: SDLC Communication Feature (#6301 or #6302). Limitation: Cannot be installed with 1200 BPS Integrated Modem (#5600), or Terminal Loop Feature (#7820). Maximum: One. Field Installation: Yes.

MULTILINE DISPLAY (#4750). Displays up to 240 characters ... six lines of 40 characters each. Characters are presented in predefined 7 x 9 and 7 x 7 dot matrices for upper case alphabetic, lower case alphabetic, and Roman characters, using the Hebrew alphabet. Additional interactive functions are provided for expanded communications between the user and the attached host. Maximum: One. Field Installation: Yes. Prerequisite: 1) The change key is required if display paging ... see Keyboard under 'Specify' or 2) Increased storage may be required to support larger size of display and additional function ... see Additional Storage Feature (#1301) and Storage Expansion Feature (#6501).

IBM 1200 BPS INTEGRATED MODEM (#5500). Provides an internal modem for communications attachment to the S/370 or 3704, 3050, or the Communications Adapter (#1601) on a 4331. Required for attachment to communication facilities through the IBM 1200 BPS Integrated Modem (#5500), or through the EIA Interface (#3701) to any 1200 bps external modem which does not have internal clocking. Prerequisite: IBM 1200 BPS Integrated Modem (#5500) if no external modem, or EIA Interface (#3701) if external modem. Limitation: Cannot be installed with Terminal Loop Feature (#7820), SDLC Communication Feature Without Clocking (#6302), Terminal Loop Feature (#7820), or 1200 BPS Loop Integrated Modem (#8001). Maximum: One. Field Installation: Not recommended for field installation if Terminal Loop Feature (#7820) is installed. SDLC Communications Feature Without Clocking (#6302) can be changed in the field to #3602. Transmission: This feature operates over common carrier communication facilities. For information concerning these facilities, see M 2700 pages.

SDLC COMMUNICATIONS FEATURE WITHOUT CLOCKING (#6302). Provides capability to attach to a host system via SDLC, e.g., S/370 or 4300 Processor through a 3704, 3705, or the Communications Adapter (#1601) on a 4331. Required for attachment to communication facilities through the IBM 1200 BPS Integrated Modem (#5500), or through the EIA Interface (#3701) to any 1200 bps external modem which does not have internal clocking. Prerequisite: IBM 1200 BPS Integrated Modem (#5500) if no external modem, or EIA Interface (#3701) if external modem. Limitation: Cannot be installed with Terminal Loop Feature (#7820), SDLC Communication Feature With Clocking (#6301), IBM 1200 BPS Integrated Modem (#5500), or 1200 BPS Loop Integrated Modem (#8001). Maximum: One. Field Installation: Not recommended for field installation if Terminal Loop Feature (#7820) is installed. SDLC Communications Feature With Clocking (#6301) can be changed in the field to #3601. Transmission: This feature operates over common carrier communication facilities. For information concerning these facilities, see M 2700 pages.

External Modems: IBM external attached, that may be attached to a host system via SDLC, e.g., S/370 or 4300 Processor through a 3704, 3705, or the Communications Adapter (#1601) on a 4331. Required for attachment to communication facilities through the EIA Interface (#3701) to any external modem which provides internal clocking speeds up to 4800 bps. Prerequisite: EIA Interface (#3701). Limitations: Cannot be installed with Terminal Loop Feature (#7820), SDLC Communications Feature With Clocking (#6301), IBM 1200 BPS Integrated Modem (#5500), or 1200 BPS Loop Integrated Modem (#8001). Maximum: One. Field Installation: Not recommended for field installation if Terminal Loop Feature (#7820) is installed. SDLC Communications Feature Without Clocking (#6302) can be changed in the field to #3602. Transmission: This feature operates over common carrier communication facilities. For information concerning these facilities, see M 2700 pages.

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STORAGE EXPANSION FEATURE ([#501]). Provides capability to add increments of the Additional Storage Feature ([#1301]) if Multiline Display ([#4750]) is installed. Required for either: 1) the first #1301 increments when ordered with #4750 and 3DL COMMUNICATIONS FEATURE ([#6301] or [#6302], or 2) the third #1301 increment when ordered with #4750 and Terminal Loop Feature ([#7200]), Forward Multiline Display ([#4750]). Maximum: One. Field Installation: Yes.

TERMINAL LOOP FEATURE ([#7820]). Provides capability to attach to a 3601/3602 loop. Attachment to local loop is direct.

Attachment to remote loop can be either directly or via remote subloop through a 3603, a 3604 mdl 2, 3 or 4, or a 3614, or another 3624.

Prerequisites: [1] Available position on the loop. [2] Depending upon the configuration, the Additional Storage Feature ([#1005] or [#1006]) may be required on the 3601/3602 ... see 3601 or 3602. [3] Attachment to a 3601/3602 local loop directly does not require an additional feature. [4] Attachment to a 3601/3602 remote loop directly requires 1200 BPS Loop Integrated Modem ([#8001]). [5] Attachment to a 3601/3602 remote loop via SDLC Terminal Attachment Unit mdl 1 or 2 for 1200 bps or mdl 2 for 2400 bps ... 3604 mdl 2, 3 or 4 with Line Feature Base ([#4751] or [#4752]) and appropriate modem ... 3614 with Terminal Loop Feature ([#7820] and 1200 BPS Loop Integrated Modem ([#8001]) ... or another 3624 with Terminal Loop Feature ([#7820] and 1200 BPS Loop Integrated Modem ([#8001]). SDLC Loop for attachment to a 3601/3602 local loop specify one of the following loop speeds: [9062] for 1200 bps, [9063] for 2400 bps, or [9064] for 4800 bps. [9065] Do not have subloop speed through a 3603 mdl 1 or 2 at 1200 bps, [9066] ... [3] For attachment to 3601/3602 remote loop via subloop through 3603 mdl 2 at 2400 bps, or [9067] for 3601/3602 remote loop via subloop through 3604, 3614 or another 3624, [9068] for 1200 bps. Limitations: [1] Cannot be installed with SDL COMMUNICATIONS FEATURE ([#6301] or [#6302]), IBM 1200 BPS Loop Integrated Modem ([#5500]) ... [2] Remote loop speed is 1200 bps maximum when attached directly or via subloop through 3603 mdl 1 or 2, 3604, 3614, or another 3624 ... 2400 bps maximum via subloop through 3603mdl 2 ... [3] Loop Integrated Modem ([#8001]) is not required if the 3624 is attached to a local loop, or via subloop to remote loop through 3603, 3604, 3614 or another 3624. Maximum: One. Field Installation: Not recommended for field installation if SDL COMMUNICATIONS Feature ([#6301] or [#6302]) is installed.

THIRD TRACK ([#7950]). Provides for reading data on track two and/or both reading and writing data on track three of magnetic stripe card. Presently conforms to ISO/3554/AD1 Third Track Standard, and proposed Data Content Standard ([#4902]) ... or another 3624. Maximum: One. Field Installation: Not recommended.

TRANSACTION STATEMENT PRINTER ([#2021]). Prints document showing record of transaction and issues to user through the transaction statement slot. Prints documents for audit use that can be retained in a journal stacker in the 3624. Print feed hopper has a capacity of 400 documents. Data is printed on 96-column card stock 2-5/8" x 3-1/4" ([66.7mm x 82.6mm] in size). Provides a 57 character one-reverse line punch character set consisting of 56 printable graphics and space characters. Can read tracks two and three independently or in conjunction with each other. Maximum: One. Field Installation: Not recommended.

HEAVY-DUTY ENCLOSURE, SINGLE FUNCTION ([#3901]). [Mlds 2 and 12 only] Required for installation of mdl 2 and 12 with currency dispensing function only (Note: The dual function heavy-duty enclosure may be used with either currency dispensing function only, if desired.) Provides a thick steel enclosure for currency dispensing mechanism of through-the-wall models when attached to a 3604 or 3614, or another 3624. Maximum: One. Field Installation: Not required if 3624 is attached to a local or remote loop through 3601, 3602, 3604, 3614 or another 3624. Provides a thick steel enclosure for currency dispensing and depository mechanisms. A single rear access door includes a combination lock. The combination of the combination lock is set by the customer. Dual Lock ([#3375]) is available as an option, providing keylock that prevents turning the combination dial when locked; used for dual control and/or where bank examiner type lock is desired. Penetration-detection grid is provided across the inside front face of enclosure.

HEAVY-DUTY ENCLOSURE, DUAL FUNCTION ([#3902]). [Mlds 2 and 12 only] Required for installation of mdl 2 and 12 with currency dispensing and depository functions. Can also be used to house currency dispensing function without depository, providing additional security. Provides a thick steel enclosure for currency dispensing and depository mechanisms. A single rear access door includes a combination lock. The combination of the combination lock is set by the customer. Dual Lock ([#3375]) is available as an option, providing a second combination lock on the rear access door. Dial Keylock ([#3310]) is available as an option, providing keylock that prevents turning the combination dial when locked; used for dual control and/or where bank examiner type lock is desired. Penetration-detection grid is provided across the inside front face of enclosure.

BEZEL, THROUGH-THE-WALL ([#1490] or [#1491]). [Mlds 2 and 12 only] Required for installation of mdl 2 and 12. Provides bezel to interface outside wall surface with 3624 enclosure through-the-wall of building or other structure. [1490] -- a recessed bezel that provides a shelf for drive-up use ... [1491] -- a non-recessed bezel which positions the user guidance area nearer outside wall surface. Recommended for drive-up use.

PEDESTAL, FOR HEAVY-DUTY ENCLOSURES ([#4901] or [#4902]). [Mlds 2 and 12 only] Available for installation of mdl 2 and 12. A mounting stand to locate the 3624 at a height most convenient for user operation, includes a lockable storage cabinet ... available for single and dual function heavy-duty enclosures in heights appropriate for walk-up or drive-up use. Recommended nominal keyboard heights are 52" ([1321mm]) for walk-up use ... 42" ([1067mm]) for drive-up. Modules are sold without keylock; recommended keylock ([#4901]) ... [4902] -- for 3624s that use the single function enclosure ([#3901]) ... [4902] -- for 3624s that use the dual function enclosure ([#3902]). For keyboard centerline height from mounting surface -- [9701] for 42" ([1067mm]) ... [9702] for 47" ([1194mm]) ... or [9703] for 52" ([1321mm]).

STORAGE CABINET, FOR DUAL FUNCTION HEAVY-DUTY ENCLOSURE ([#4903]). [Mlds 2 and 12 only] Available for installation of mdl 2 and 12. A lockable storage cabinet for installation of the dual function heavy-duty enclosure ([#3902]) directly to a mounting surface where a pedestal is not required.

PEDESTAL, LOBBY ([#5510]). [Mlds 1 and 11 only] A mounting stand for free-standing configuration of lobby model without the depository feature. Note: [5510] is not required if customer intends to install a 3624 mdl 1 or 11, without the depository feature, on an alternative mounting surface or stand. That lockable ... 3624 mdl 1 or 11 is installed with a depository feature ([#3233]) since a pedestal base is included in model 3633.

ACCESSORIES: The following items are available on a purchase only basis. See M 10000 pages for additional description, feature codes, prices and order information.
### 3624 Consumer Transaction Facility (cont'd)

**FRONT DRESS PANEL (#3951).** [Mds 2 and 12 only] Required for installation of mdls 2 and 12. Provides user guidance area panel covers and logo lamp assembly.

**FRONT TRIM BORDER (#3961 or #3962).** [Mtls 2 and 12 only] Required for installation of mdls 2 and 12. Provides trim border panel around the bezel on the outside of building for outer seal of through-the-wall installation. 

### LOGO PANEL (#9401, #9402, #9403). [All Models] Required for installation on all models of the 3624. Provides a panel that can be personalized by the customer (silk-screened, painted, etc.). Can be shipped with the 3624 or prior to the 3624. See "Specify Section" above for specification of appropriate specify code.

**CURRENCY CARTRIDGE (#9110).** Required for installation of any 3624. Portable container for loading, storing, transporting, and issuing currency or other approved documents inter-changeable between 3624s. See M 10000 pages for customer responsibilities, recommended number of spare cartridges, and maintenance.

**DEPOSITORY CARTRIDGE (#3155).** [Mtls 2 and 12 only] Portable container for receiving and transporting deposits. Required for operation with Depository Cartridge Locking Feature (#3150).

**3624 CURRENCY AREA LOCKOFF (#3312).** [Models 2 and 12 only] Provides a security panel to enclose the currency area. Enables the document feed mechanism to be locked in the machine. When used with the Depository Cartridge Locking Feature (#3150), it restricts access to the currency area during normal operational servicing of the depository and/or other areas of the 3624. Includes keylock and standard key. Available only when installed with the Heavy Duty Enclosure, Dual Function (#3902).

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### PILOT TEST

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IBM 3631 PLANT COMMUNICATION CONTROLLER

Purpose: A programmable controller for attachment of 3640 terminals to S/370 or 4300 processors using appropriate virtual storage system control programs, or an 8100 System using the Distributed Processing Program Executive (DPPEX).

S/370 or 4300 Processor attachment is via a 3704/3705 Communications Controller using synchronous data link control (SDLC) transmission protocols over various common carrier or user-owned transmission facilities. Communication is also possible via a Communications Adapter feature on the 4331 Processor (Note: This is not supported by ACF/VTAME).

B100 System attachment is via the B130, B140 and/or the B101 data link using SDLC transmission protocols over various common carrier or user-owned transmission facilities.

Terminal attachment is via directly attached or data link attached loops which utilize synchronous data link control (SDLC) transmission protocols. The loops are user-owned transmission facilities which are constructed from IBM accessories ... see “3630 Loop Accessories” in M 10000 pages.

Model 1A Includes an IBM diskette drive which accommodates an IBM Diskette 1 diskette of 250 Kbyte capacity.

Model 1B Includes an IBM diskette drive which accommodates an IBM Diskette 2 diskette of 500 Kbyte capacity.

Highlights

Controls the functions of a 3630 Plant Communication System. Customers, using SCP programs on virtual storage S/370 or 4300 Processor systems or B100 Systems, will prepare user-written application programs which direct system operation. The controller can be programmed to operate independently when the S/370 is unavailable. It is capable of controlling terminal functions, executing arithmetic and logic functions, and capturing data from the terminals for later transmission to the S/370. A keylock is provided for locking access to the diskette drive.

The model 1A accommodates IBM Diskette 1 of 250K byte capacity. The Model 1B accommodates IBM Diskettes 1 or 2 having 253K and 500K byte capacities. The diskette provides permanent storage for control code and application programs, plus permanent and temporary storage for user data. Data required to be on the diskette, exclusive of customer data, will often exceed 200K bytes. During normal operation, performance characteristics of the diskette drive dictate that that device be used primarily for infrequent data logging. IBM and customer code is transmitted to the controller where it is written on a diskette. The diskette may also be used to hold application data in the space not required for control code. At controller startup, diagnostic, control code and application code are read from the diskette into control and application storage. During system operation, the diskette may be used to access data and code.

Storage included in the controller is used for control code, and application control data and instructions. The amount of storage available for application programming depends on the attached terminal configuration and user environment. Included in the basic machine is 65,536 bytes of application storage. Both control and application storage may be extended in 16,384 byte increments ... see “Special Features.”

All 3640 terminals are attached to customer-owned loops. A variety of accessories and wire are available for the construction of the loops ... see “3630 Accessories” in the M 10000 pages. Up to two Loop Adapters may be installed to directly connect one loop each. The Loop Adapters each provide two loop lobes. Each lobe may extend up to 3.2 cable kilometers (2 cable miles). Loops are operated at 9600 bps. A loop, consisting of one lobe, may be connected to a 3842 Loop Control Unit. The 3842 can be connected multipoint or point-to-point on a common carrier or customer-owned transmission facility to an IBM 3663 or 3872 Modem at the 3631 site for operation at 2400 bps. A loop can accommodate a number of loop-terminal connections. See the IBM 3630 Plant Communication System Description for additional information.

Communication with a virtual storage host S/370 or 4300 processor is via a 3704, 3705 or Communications Adapter on 4331 Processor using SDLC and SNA protocols. The EIA/CCITT Interface - Host (#3701) and either an external modem or the Line Set Type 1F (#4716) on the 3704/3705 (on 4331, the Local Attachment Interface (#4801) feature) are required for host communication. See M 27000 and M 4331 pages for Communications Adapter features on 4331. Each 3631 operates in half-duplex mode. Duplex communication line operations are possible with multiple 3631s and 3632s attached to the line ... one 3631/3632 transmitting while the other receives.

SUPPLIES: For customer-owned diskettes

PREREQUISITES

Communication with a virtual storage host S/370 or 4300 processor is via a 3704, 3705 or Communications Adapter on 4331 Processor equipped with appropriate features ... see 3704, 3705 or 4331 pages.

A 3604 Keyboard Display mdl 6 or its equivalent is required as a control station and is directly attached to the controller. Two 10-foot cables will be supplied with the 3631. The magnetic stripe features are not supported.

The 3631 Controller and 3604 control terminal have been designed for operation in physical environments characteristic of office areas. See IBM 3630 Plant Communication System - Installation Manual - Physical Planning, GA24-3675.

One host communication feature: #6301, #6302 or #4502 is required ... see “Special Features.”

A 3630 Test Loop #9445 is required for installation with the first 3631 at each site ... see “Specify.”

Two wrap type Loop Station Connectors are required for each local adapter (#4780).

3631/3632 programming support material must be ordered from PID and installed on the host processor.

Loop Continuity and Relay Testers, Part No. 1657420, should be purchased by the customer for testing his loop wiring. One tester should be available at each physical location of controller(s) loops or remote loop(s) that will require loop cable testing.

Telecommunication equipment should be available at the controller site for communication with the host, remote loops and key locations along loops.

A 3643 Keyboard Display terminal should be located in close proximity to 3842 Loop Control Units for remote loop and connected terminal testing.

Bibliography: IBM 3630 Plant Communication System - System Description, GA24-3652 ... IBM 3630 Plant Communication System - System Description, GA24-3652 ... IBM 3630 Plant Communication System - Loop Installation Manual - Physical Planning, GA24-3675 ...


SPECIFY

- Voltage (115 V AC, 1 phase, 60 Hz, 1.8 meter (6 foot) cable; #9960 for locking plug, or #9861 for non-lock plug. These are usable on 120 V AC systems. Field Installation: Not recommended.

- Distribution of Microcode: One copy of the 3631 or 3632 System Microcode is required for each S/370 attaching a 3631 or 3632. The address for the initial shipment must be supplied as a Supplementary Specification

Specify: #9491 for initial 3630 System ordered for attachment to the S/370 or #9492 for any additional 3630 system ordered for attachment to the S/370.

For distribution of microcode to the S/370 location specify the media:

#9412 9/800 magnetic tape
#9413 9/1600 magnetic tape
#9414 9/6250 magnetic tape
#9431 80 column card
#9432 96 column card

Shipping address for the 3630 System microcode must be supplied.

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This is the address to which the microcode will be automatically sent for the 3630 System (designated #3701). Whenever the 3630 is updated by an EC, the microcode will be sent to the current TPC# address. The TPC# (Teleprocessing Control Number)

- Loop Accessories and Loop Cable: 10 Loop Accessory Keys are shipped with the 3631. See M 10000 pages for descriptions, prices and ordering instructions for 3630 System Accessories.

- 3630 Test Loop: Specify #9445 on the first 3631 or 3632 to be installed at each site. Field Installation: Yes.

**ADDITIONAL STORAGE FEATURE (#1006).** Provides an additional 18,304 byte increment of storage for device attachment or application storage. To determine the number and type of storage features required see the configurator in the 3630 Plant Communication System Description. Specify: #9591 for Additional Device Attachment Control Storage, or #9592 for Additional Application Storage. Maximum: Five ... one with specify #9591, up to four with specify #9592. Field Installation: Yes. Note: The quantity of feature #1006s must equal the combined quantities of specify #9591 and #9592(s).

**HOST COMMUNICATIONS FEATURES**

For communication with the host processor, each 3631 must be equipped with EIA/CCITT - Host (#3701) and one of the following SDLC features: #4502, #6301, or #6302.

**EIA/CCITT INTERFACE - HOST (#3701).** Provides the appropriate cables and interface logic necessary to attach an external modem for communication to the host processor through the 3704, 3705, 3707, or 3713 Processor for local attachment to the 3704, 3705 or Communications Adapter on 4331, without requiring modems. Maximum: One. Field Installation: Yes. Prerequisite: A Communications Feature (#4502, 6301 or 6302).

**SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#4502).** Required for attachment to communication lines through an external modem which provides clocking at speeds up to 9600 bps. Maximum: One. Limitation: Cannot be installed with #6301 or #6302. Field Installation: Yes. Prerequisite: EIA/CCITT Interface - Host (#3701).

**HOST COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCKING (#6301).** Required for attachment to communication lines through any external modem which does not provide clocking for speeds of 600, 1200 and 2400 bps, or for local attachment to the 3704, 3705 or Communications Adapter on 4331 Processor. See Feature #4716 under "Special Features" for the 3704 or 3705, or 4331 pages. Maximum: One. Limitation: Cannot be installed with #6302 or #4502. Field Installation: Yes. Prerequisite: EIA/CCITT Interface - Host (#3701).

**HOST COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#6302).** Required for attachment to communication lines through an external modem which provides clocking at speeds up to 4800 bps. Maximum: One. Limitation: Cannot be installed with #6301 or #4502. Field Installation: Yes. Prerequisite: EIA/CCITT Interface - Host (#3701).

**TERMINAL ATTACHMENT**

The Data Link Adapter (#3211), Loop Adapter (#4780), and EIA/CCITT Interface (#3703) features enable the 3631 Controller to attach 3640 terminals. Data Link terminal attachment capability is provided by selection of the EIA/CCITT Interface - Data Link (#3703) with the Data Link Adapter (#3211). Direct terminal attachment capability is provided by selection of the Loop Adapter (#4780) and the Data Link Adapter (#3211). A maximum of two directly attached loops and two data links for attachment of 3842s may be installed.

The data links are used to provide point-to-point or multipoint facilities for the connection of the 3842 Loop Control Units. The 3842 attaches at the remote ends of the data link where it establishes a remote loop. The 3872 Modem connects the EIA/CCITT Interface - Data Link (#3703) and the data link at the controller. The loop operates at the same speed as the data link.

**CUSTOMER RESPONSIBILITIES FOR LOOPS:**

1. The customer must purchase, install, and maintain loops for terminal attachment. See IBM 3630 Plant Communication System Description for further information. See IBM 3630 Plant Communication System Loop Installation Manual - Physical Planning for further planning and installation information on loop components, loop cable, loop wiring configurations, Continuity and Relay Tester, and maintenance and test procedure. See M 10000 pages for bulk cable and accessories.

**DATA LINK ADAPTER (#3211).** Provides the control logic to establish SDLC communications for terminal attachment. Maximum: Four. Field Installation: Yes. Prerequisite: Required once for each Loop Adapter (#4780) and once for each EIA/CCITT Interface - Data Link (#3703).

**EIA/CCITT INTERFACE - DATA LINK (#3703).** Provides an EIA/CCITT interface for attachment of a 3872 Modem for the connection of the 3842. Maximum: Two. Field Installation: Yes. Prerequisite: Data Link Adapter (#3211). Limitation: The sum of the bps operating rates for all EIA/CCITT Interfaces (#3701 and #3703) and the Loop Adapters (#4780) may not exceed 28,800 bps.

**LOOP ADAPTER (#4780).** Allows direct attachment of a loop with one or two loops to the controller operating at a speed of 9600 bps. Maximum: Two. Field Installation: Yes. Prerequisite: Data Link Adapter (#3211), and a wrap type Loop Station Connector, in each connected lobe.

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IBM 3632 PLANT COMMUNICATION CONTROLLER

Purpose:
A programmable controller for attachment of 3640 terminals to S/370 or 4300 processors using appropriate virtual storage system control programs, or an 8100 System using the Distributed Panel Access Program Executive (DPPE).

S/370 or 4300 Processor attachment is via a 3704, 3705 or Communications Adapter on 4331 Processor using Synchronous Data Link Control (SDLC) transmission protocols over various common carrier or user-owned transmission facilities. Communication is possible via a Communications Adapter feature on the 4331 Processor (Note: This is not supported by AGF/VTAME).

8100 System attachment is via the 8130, 8140 and/or the 8101 data links using SDLC transmission protocols over various common carrier or user-owned transmission facilities.

Terminal attachment is via directly attached or data link attached loops. The loops are user-owned transmission facilities which are constructed from IBM accessories see "3630 Loop Accessories" in M 10000 pages. The loops are connected via common carrier or user-owned transmission facilities.

Model 1A
A programmable controller with a 5 megabyte disk.

Model 1B
A programmable controller with a 9.2 megabyte disk.

Highlights:
Controls the functions of a 3630 Plant Communication System. Customers, utilizing SCP programs on virtual storage S/370, 4300 Processor or 8100 Systems, will prepare user-written application programs which direct system operation. The controller can be programmed to operate independently when the processor is unavailable. It is capable of controlling terminal functions, executing arithmetic and logic functions, and capturing data from the terminals for later transmission to the processor. Information may be stored on the disk for use in responding to terminal inquiries.

It houses a disk storage device (5 or 9.2 Mb capacity) for storage of user data. This storage device is not removable except by service personnel. A fixed head is available which will provide additional heads with access to data on 8 tracks see "Additional Disk Heads (#1010, 1011) under "Special Features."

It houses a direct access diskette drive which accepts both IBM Diskette 1 and 2 having respectively 250K and 500K byte capacities. The diskette provides permanent storage for control code and application programs, plus permanent and temporary storage for user data. Data required to be on the diskette, exclusive of customer data, will often exceed 200K bytes. During normal operation performance characteristics of the diskette drive dictate that the device be used primarily for infrequent data logging.

IBM and customer code is transmitted to the controller where it is written on a diskette. The diskette may also be used to hold application data in the space not required for the control code. At controller start-up, diagnostics, control code and application code are read from the diskette into control and application storage. During system operation, both the disk and the diskette may be used to access data and code.

Storage included in the controller is used for control code, and application control data and instructions. The amount of storage available for application programming depends on the attached terminal configuration and user environment. Included in the basic machine is 65,536 bytes of application storage. Both control and application storage may be extended in 16 364 byte increments see "Special Features."

All 3640 terminals are attached to customer-owned loops. A variety of accessories and wire are available for the construction of the loops see "3630 Accessories" in the M 10000 pages. Up to two Loop Adapters may be installed to directly connect one loop each. The Loop Adapters each provide two loop loops. Each lobe may extend up to 3.2 cable kilometers (2 cable miles). Directly attached loops are operated at 9600 bps. A loop, consisting of one lobe, may be connected to the 3842 Loop Control Unit. The 3842 can be connected multipoint or point-to-point on a common carrier or customer-owned transmission facility to the 3872 Modem at the 3632 site for operation at 2400 bps. A loop can accommodate a number of loop-terminal connections see "3630 Plant Communication System Description for additional information.

Communication with a host S/370 or 4300 processor is via a 3704, 3705 or Communications Adapter on 4331 Processor using SDLC and SNA protocols. The EIA/CCITT Interface - Host (#3701), and either an external modem or the Line Set Type 1F (#4801L), on the 3704/3705 (on 4331 the Local Area Network Interface #4801 feature) are required for host communication. See M 2700 and M 4331 pages for Communications Adapter features on 4331. Each 3632 operates in half-duplex mode. Duplex communication line operations are possible with multiple 3631s and 3632s attached to the line see one 3631/3632 transmitting while the other receives.

Communication with an 8100 System is via the 8130, 8140 and/or the 8101 data link using the SDLC protocol. The EIA/CCITT Interface - Host (#3701) on the 3632 is used on an SDLC data link or the direct connect facility provided by the 8100. Each 3631 operates in half-duplex mode.

The following IBM external modems can be used:

<table>
<thead>
<tr>
<th>Model</th>
<th>Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>3863 m1</td>
<td>2400/1200 bps - non-switched</td>
</tr>
<tr>
<td>3864 m1</td>
<td>4800/2400 bps - non-switched</td>
</tr>
<tr>
<td>3865 m1</td>
<td>9600/4800 bps - non-switched</td>
</tr>
<tr>
<td>3872 m1</td>
<td>2400/1200 bps - non-switched</td>
</tr>
<tr>
<td>3874 m1</td>
<td>4800/2400 bps - non-switched</td>
</tr>
</tbody>
</table>

Note: 4-wire Switched Network Backup is available on the 3863 m1, 3864 m1 and 3865 m1 or 2. For communications capabilities, product utilization and features, see 3863, 3864, 3865, 3872, 3874 and M 2700 pages.

Supplies: customer-usable diskettes

Prerequisites:
Communications with a virtual storage S/370 or 4300 Processor is via a 3704, 3705 or Communications Adapter on 4331 Processor equipped with appropriate special features see 3704/3705 or 4331 pages.

Communications with the 8100 System is via the 8130, 8140 and/or the 8101 data link using the appropriate features see 8130, 8140 and 8101. When ordering this machine for attachment to an 8100 System, "Terminal Requirements" under 8130, 8140 and 8101 in "Machines" should be reviewed.

A 3804 Keyboard Display m1 6, or its equivalent, is required as a control station and is directly attached to the controller. Two 10 foot connecting cables will be supplied with the 3632. The magnetic stripe optional features on the 3804 are not supported.

The 3632 Plant Communication Controller and 3604 Keyboard Display m1 6 have been designed for operation in physical environments characteristic of office areas. See IBM 3630 Plant Communication System - System Description Manual for further information.

One host communication feature (#6301, 6302 or 4502) is required see "Special Features."

Two wrap type Loop Station Connectors for each Loop Adapter (#4780).

A 3630 Test Loop (#9445) for installation with the first 3632 at each site see "Specify."

3631/3632 programming support material must be ordered from IBM and installed on the host processor.

Loop and Remote Testers, P/N 1657420, should be purchased by the customer for testing his loop wiring. The tester should be available at each physical location of controller(s) loops or remote loop(s) that will require loop cable testing.

Telephone communication should be available at the controller site for communication with the host, remote loops and key locations along loops.

A 3643 Keyboard Display terminal should be located in close physical proximity to 3842 Loop Control Units for remote loop and connected terminal testing.

Bibliography:

SPECIFY

- Voltage (AC, 1-phase, 60 Hz): 115 V (usable on 120 V) – #9880 for locking plug, or #9881 for non-lock plug. 208 V – #9884 for locking plug, or #9885 for non-lock plug. 230 V – #9886 for locking plug, or #9887 for non-lock plug.

Field Installation: Not recommended.

- Distribution of Microcode: One copy of the 3631 or 3632 System Microcode is required for each S/370 attaching a 3632 or 3632. The address for the initial shipment must be supplied as a Supplementary Specification via AAS as shown below.

Specify #9491 for initial 3630 system ordered for attachment to 3632 or 3632. The address for the initial shipment must be as shown below.

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DP Machines

3632 Plant Communication Controller (cont'd)

For distribution of microcode to the S/370 location specify the media:

- #9412 9/800 magnetic tape
- #9413 9/1600 magnetic tape
- #9414 9/6250 magnetic tape
- #9431 80 column card
- #9432 96 column card

Shipping address for the 3630 system microcode must be supplied.

This is the address to which the microcode will be automatically sent for the 3630 System (designated #946). Whenever a 3630 is updated by an EC, the microcode will be sent to the current TPC# address. The TPC# (Teleprocessing Control Number)

- Loop Accessories and Loop Cable: 10 Loop Accessory Keys are shipped with the 3632. See M 10000 pages for descriptions, prices, and ordering instructions for 3630 System Accessories.

3630 Test Loop: Specify #9445 on the first 3631 or 3632 to be installed at each site. Field Installation: Yes.

**MLC**

<table>
<thead>
<tr>
<th>PRICES Mdl</th>
<th>MRC 2 Yr</th>
<th>Purchase MMC</th>
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<tr>
<td>1A</td>
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<td>$1,305</td>
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<tr>
<td>1B</td>
<td>$1,622</td>
<td>$1,380</td>
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</tbody>
</table>

Plan Offering: Plan B Purchase Option: 55% Per Call: Machine Group: D Warranty: B Usef Life Category: 2 Termination Chg Mnth: 5 Termination Chg Percent: 25% Upper Limit percent: 5%

**MODEL UPGRADE PURCHASE PRICE** (there are no additional installation charges... all replaced parts become the property of IBM.)

- Model 1A to Model 1B ... \$3,000.

**SPECIAL FEATURES**

**ADDITIONAL STORAGE FEATURE (#1006).** Provides an additional 16,384 byte increment of storage for data attachment or application storage. To determine the number and type of storage features required, see the Configurator in the IBM 3630 Plant Communication System Description Manual. Specify: #9591 for additional device attachment control storage, or #9592 for additional application storage. Maximum: #1006 with #9591 specified - 1 ... #1006 with #9592 specified - 4 ... a maximum of five #1006s. Note: The quantity of #1006s must equal the total combined quantity of specify codes #9591 and #9592. Field Installation: Yes.

**ADDITIONAL DISK HEADS (#1010 for mdl 1A, #1011 for mdl 1B).** Provides eight additional disk heads for the disk file, as specified by model type selected. Maximum: One. Field Installation: Not recommended.

**HOST COMMUNICATION FEATURES.** For communications with the host processor, each 3632 must be equipped with EIA/CCITT Interface - Host (#3701) and one of the following Communications features:

- EIA/CCITT INTERFACE - HOST (#3701). Provides the appropriate cables and interface logic necessary to attach an external modem for communications to the host processor through the 3704/3705 or local attachment to the 3704/3705 without requiring modems. Maximum: One. Field Installation: Yes. Prerequisite: Communications Feature (#4502, 6301 or 6302).

- SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#4502). Required for attachment to communications lines through an external modem which provides clocking at speeds up to 9600 bps. Maximum: One. Limitation: Cannot be installed with #6301 or #6302. Field Installation: Yes. Prerequisite: EIA/CCITT Interface - Host (#3701).

**HOST COMMUNICATIONS FEATURE WITH BUSINESS MACHINE CLOCKING (#6301).** Required for attachment to communication lines through any external modem which provides clocking for speeds of 600, 1200 and 2400 bps, or for local attachment to the 3704/3705... see Line Set Type 1F (#4716) under 'Special Features' for the 3704 or 3705. Limitation: Cannot be installed with #6302 or #4502. Maximum: One. Field Installation: Yes. Prerequisite: EIA/CCITT Interface - Host (#3701).

**HOST COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCKING (#6302).** Required for attachment to communications lines through an external modem which provides clocking at speeds up to 4800 bps. Maximum: One. Limitation: Cannot be installed with #6301 or #4502. Field Installation: Yes. Prerequisite: EIA/CCITT Interface - Host (#3701).

**TERMINAL ATTACHMENT:** The Data Link Adapter (#3211), Loop Adapter (#4780), and EIA/CCITT INTERFACE (#3703) features enable the 3632 Controller to attach 3640 terminals. Data link terminal attachment capability is provided by selection of the EIA/CCITT Interface - Data Link (#3703) with the Data Link Adapter (#3211). Direct terminal attachment capability is provided by selection of the Loop Adapter (#4780) and the Data Link Adapter (#3211). A maximum of two directly attached loops and two data links for attachment of 3842s may be installed.

The data links are used to provide point-to-point or multi-point facilities for the connection of the 3842 Loop Control Units. The 3842 attaches at the remote ends of the data links where it establishes a remote loop. The 3872 Modem connects the EIA/CCITT Interface - Data Link - (3703) and the data link at the controller. The loop operates at the same speed as the data line.

**CUSTOMER RESPONSIBILITIES FOR LOOPS.** The customer must purchase, install and maintain loops for terminal attachment... see IBM 3036 Plant Communication System Description Manual for further information. See IBM 3630 Plant Communication System Loop Installation Manual - Physical Planning for further planning and installation information on loop components, loop cable, loop wiring configurations, Continuity and Relay Tester, and maintenance and test procedures. See M 10000 pages for bulk cable and accessories.

**DATA LINK ADAPTER (#3211).** Provides the control logic to establish SDLC communications for terminal attachment. Prerequisite: Required once for each Loop Adapter (#4780) and once for each EIA/CCITT Interface - Data Link (#3703). Maximum: Four. Field Installation: Yes.

**EIA/CCITT INTERFACE - DATA LINK (#3703).** Provides an EIA/CCITT Interface for attachment of a 3872 Modem for the connection of the 3842. Field Installation: Yes. Maximum: Two. Prerequisite: Data Link Adapter (#3211). Limitation: The sum of the bps operating rates for all EIA/CCITT Interfaces (#3701 and #3703) and the Loop Adapters (#4780) can not exceed 28,800 bps.

**LOOP ADAPTER (#4780).** Allows direct attachment of a loop with one or two lobes to the controller operating at a speed of 9600 bps. Maximum: Two. System: Yes. Prerequisite: Data Link Adapter (#3211), and a wrap type Loop Station Connector in each connected lobe.

**Special Feature Prices:**

<table>
<thead>
<tr>
<th>MRC 2 Yr</th>
<th>Purchase MMC</th>
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<tbody>
<tr>
<td>Add 1 Storage Feature #1006</td>
<td>$58 $49 $1,170 $10.00</td>
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<td>Add 1 Disk Heads: For Model 1A</td>
<td>1010 12 27 1,080 17.00</td>
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<tr>
<td>For Model 1B</td>
<td>1011 32 27 1,080 17.00</td>
</tr>
<tr>
<td>Data Link Adapter</td>
<td>3211 35 30 1,200 10.50</td>
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<td>E1A/CCITT Interface</td>
<td>3701 12 10 424 4.00</td>
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<tr>
<td>Data Link</td>
<td>3703 12 10 424 4.00</td>
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<tr>
<td>Loop Adapter</td>
<td>4780 22 26 940 17.50</td>
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<tr>
<td>SDLC Communications Feature</td>
<td>w/o clk 9600 bps 4502 35 30 1,200 10.50</td>
</tr>
<tr>
<td>With clk 4200 bps 6301</td>
<td>19 16 710 3.00</td>
</tr>
<tr>
<td>With clk 4800 bps 6302</td>
<td>12 10 747 2.50</td>
</tr>
</tbody>
</table>

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IBM 3641 REPORTING TERMINAL

Purpose: The 3641 Reporting Terminal models 1 and 2 are interactive workstations with a wide range of options to meet individual customer requirements for data entry and response.

Model 1
Has a 22-character alphanumeric display. Either a 35-key numeric keyboard or 70-key alphanumeric keyboard feature must be specified. Optional features include a Magnetic Reader Attachment and a Digital Input/Digital Output with 32 input and 8 output points.

Model 2
Has a 22-character alphanumeric display. Either a 35-key numeric keyboard or 70-key alphanumeric keyboard feature must be specified. Optional features include a Magnetic Reader Attachment, a Magnetic Reader, and a Magnetic Character Reader adapter.

A Digital Input/Output feature for exchange of data between the 3641 and customer devices.

A removable keyboard overlay and function key mask which can be customized by the customer.

Supplies: 80-column cards ... Punched Hole Badges ... Magnetic Stripe Badges. These supplies, if required, may be ordered through IBM.

PREQUISITIES
1. Either the 35-key Numeric Keyboard (#4652) or the 70-key Alphanumeric Keyboard (#4653) must be specified on both 3641 Models 1 and 2.
2. A Loop Station Connector on a 3631/3632 or 3642 or 8100 System Loop.
3. The Punched Card/Punched Badge Adapter (#5781) must be specified if either Numeric Punched Hole Badge Reader (Model 1 only) or 80-column Punched Card Reader (Model 2 only) is specified. [Model 2 only]
4. Magnetic Reader Attachment (#4910) must be specified if either the Magnetic Hand Scanner, Magnetic Slot Reader, or Dual Entry Magnetic Slot Reader is ordered. See "Special Features." When ordering this machine for attachment to an 8100 System, "Terminal Requirements" under the appropriate 8130, 8140 or 8101 pages in "Machines" should be reviewed.

Bibliography: 3630 Plant Communication System - System Description, GA24-3652 ... 3641 Reporting Terminal Operating Guide, GA24-3679, or Introduction to 8100 System.

Customer Setup: The 3641 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibility: The customer is responsible for:

• Unpacking, placement, setup and checkout of the 3641 at time of delivery or when relocating the 3641.
• Removing and packing of the 3641 at time of discontinuance.
• Using and following the problem determination procedures and filling out the trouble report prior to calling for service.
• Relocation of the 3641 (if required) to allow IBM service access.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operations to determine:

• Whether or not continued operation is possible.
• Whether terminal, controller, accessory or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3641 terminal.

Maintenance of the 3641 terminals will normally be performed at the installed location.

There is no regularly scheduled IBM preventive maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in prices.

Maintenance courses are offered to the customer for a separate charge.

Physical Environments
The 3641, Models 1 and 2, and accessories may be used in the industrialized work zones of a wide range of business, industrial and commercial establishments.

They can resist:

• Concentrations of certain common, corrosive gases.
• Accumulations of dust, grit, and dirt.
• Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
• Most industrial types of electromagnetic interference associated with terminal operational sites.
• Vibration and shock associated with the shipping, operation, and relocation of the terminal for most types of industries.

For environmental specifications refer to the IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675.

SPECIFY

- Voltage (120 V AC, 1-phase, 60 Hz): #9890 for locking plug, or #9891 for non-lock plug.
- Power Cable: #9986 for 1.8 meter (6 foot) cable, or #9987 for 4.3 meter (14 foot) cable.
- Loop Connection Cable: #9976 for 1.8 meter (6 foot) cable, or #9976 for 4.3 meter (14 foot) cable.
- Color: #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

<table>
<thead>
<tr>
<th>Mdl</th>
<th>5 Yr</th>
<th>Purchase</th>
<th>MMO</th>
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Maintenance: A Per Call: 1 Purchase Option: 55% Useful Life Category: 2 Warranty: B Upper Limit Percent: 5% Termination Charge Months: 6 Termination Charge Percent: 20% Model Changes: Available at time of manufacture only.

SPECIAL FEATURES


35-KEY NUMERIC KEYBOARD (#4652). Provides 15 customer-defined function keys, 5 control keys, 10 numeric keys and 5 special character keys. Limitation: Cannot be installed with #4653. Maximum: One. Field Installation: Available at time of manufacture only.

70-KEY ALPHAMERIC KEYBOARD (#4653). Provides 20 customer-defined function keys, 5 control keys, 10 numeric keys, A-Z, 1 and 9 special character keys. Limitation: Cannot be installed with #4652. Maximum: One. Field Installation: Available at time of manufacture only.

MAGNETIC READER ATTACHMENT (#4910). Used to attach a Magnetic Hand Scanner, Magnetic Slot Reader, or Dual Entry Magnetic Slot Reader to the 3641 model 1 and 2. Note: The three magnetic readers are plug compatible. Limitation: Cannot be installed with both #5801 and #5802 on the model 2. Maximum: One. Field Installation: Yes.

PUNCHED CARD/PUNCHEO BADGE ADAPTER (#5781). [Model 2 only] Required if either Numeric Punched Hole Badge Reader (#5801) or 80-Column Punched Card Reader (#5802) is specified. Maximum: One. Field Installation: Not recommended.

* Pilot Test Plan applies.
3641 Reporting Terminal (cont’d)

NUMERIC PUNCHED HOLE BADGE READER (#5801). [Model 2 only] Provides a badge reader which can read up to 10 digits of numeric information. Maximum: One. Field Installation: Not recommended. Prerequisite: Punched Card/Punched Badge Reader Adapter (#5781). Limitation: Cannot be installed with both #4910 and #5802.


Special Feature Prices:

<table>
<thead>
<tr>
<th>MLC</th>
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<td>MMC</td>
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<tr>
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<td>4652</td>
<td>8</td>
<td>163</td>
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<td>70-Key Keyboard</td>
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<td>Magnetic Rdr Attachmt</td>
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<td>Pnchd Card/Pnchd Badge Adapter</td>
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<tr>
<td>80-Col Punched Card Rdr</td>
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Accessories: The following items are available on a purchase only basis. For shipment with machine, order the Feature Number and quantity as shown below at the price listed in the M 10000 pages. See M 10000 for additional information and for ordering

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<th>Item</th>
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<td>Magnetic Slot Reader</td>
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<tr>
<td>Dual Entry Mag Slot Reader</td>
<td>9442</td>
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<td>Mounting Bracket</td>
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<tr>
<td>Magnetic Reader Extension Cable ... for use with Magnetic Hand Scanner or Magnetic Slot Reader</td>
<td>6 meter</td>
<td>9106</td>
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<td></td>
<td></td>
<td>12 meter</td>
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</table>

* A maximum of one magnetic reader or scanner may be ordered.

** A maximum of one extension cable may be ordered.
IBM DP Machines

IBM 3642 ENCODER PRINTER

Purpose: A work station printer and magnetic stripe encoder which produces turn around documents. The magnetic stripe on the documents encoded by the 3642 can be read by the Magnetic Hand Scanner and the Magnetic Slot Reader.

Model 1 Has ten print lines and allows hand feed operation.

Model 2 Has ten print lines and allows the automatic feeding of continuous forms as well as hand feed operations.

Model Changes: Available at time of manufacture only.

Highlights

The 3642 is designed to produce magnetic stripe documents at a workstation. Its capability includes:

- Prints and encodes magnetic striped cards and labels.
- Prints 10 lines of up to 70 alphanumeral characters each.
- Encodes alphanumeral data.
- Hand feed or automatic feed documents.
- Large printed-character option.

Automatic Feeding and Bursting: The model 2 automatic feed and burst capability permits unattended operation. It provides a forms burster and a hopper which holds up to 400 continuous forms. A forms stacker which holds up to 400 cut forms is standard on both models. All continuous forms on the model 2 are automatically burst prior to encoding and printing.

The automatic feed and burst capability is designed to burst 99 pound card stock and adhesive backed labels. It is not designed to burst 150 pound tag stock.

Document Speed: The document speed depends upon the data printed and the forms size and will have to be evaluated for each application. The machine speed for a typical document is eight documents per minute.

Document Description: The 3642 contains a printer and magnetic stripe encoder that can print and encode on the following documents.

- Document Sizes: Height – 8.262cm (3.25 in) ... Length – Min: 12.7cm (5.0 in) ... Length – Max: 18.733cm (7.375 in).
- Document Types 99 pound card stock ... 150 pound white tag stock ... pressure sensitive labels.
- Document Thickness: Min. 0.018cm (0.007 in) ... Max: 0.030cm (0.011 in).


Character Sets: The 48 printed character set consists of 0-9, A-Z, and special characters period (.), single quote ('), plus (+), minus (-), and percent (%). The sets include the following characters:)... See "Specify." Also see 3630 Character Set Tables for more details.

Large character printing on the first 4 lines only - standard printing on the last 6 lines.

Supplies: Magnetic striped forms ... an ink roll (part No. 457380), or equivalent.

These supplies may be ordered through IBM.

Prerequisite: A Loop Station Connector on a 3631/3632 or 3642, or 8100 System loop.

When ordering this machine for attachment to an 8100 System, "Terminal Requirements" under the appropriate 8130, 8140 or 8101 pages in "Machines" should be reviewed.

Bibliography:

3630 Plant Communication System - System Description, GA24-3652
3642 Encoder Printer Operating Guide, GA24-3680
Forms Design Reference Guide for Printers, GA24-3488

Introduction to 8100 System.

Customer Setup: The 3642 is designed customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibility: The customer is responsible for:

- Unpacking, placement, setup and checkout of the 3642 at time of delivery or when relocating the 3642.
- Removing and packing of the 3642 at time of discontinuance.
- Using and following the problem determination procedures and filling out the trouble report prior to calling for service.
- Relocation of the 3642 (if required) to allow IBM service access.

Problem Determination Procedures: Terminal problem determination procedures (PDPS) prompt retry and recovery actions and the analysis of operation to determine:

- Whether or not continued operation is possible.
- Whether terminal, loop, controller, accessory, or media is at fault.

Proper terminal operator use of PDPS will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3642.

Maintenance of the 3642 terminals will normally be performed at the installed location. See

There is no regularly scheduled IBM preventive maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in prices.

Maintenance courses are offered to the customer for a separate charge.

Physical Environments

The 3642 models 1 and 2 may be used in the industrialized work zones of a wide range of business, industrial and commercial establishments.

They can resist:

- Concentrations of certain common, corrosive gases.
- Accumulations of dust, grit, and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operational sites.
- Vibration and shock associated with the shipping, operation, and relocation of the terminal for most types of industries.

For environmental specifications refer to the IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675.

SPECIFY

- Voltage (120 V AC, 1-phase, 60 Hz) #9890 for locking plug, or #9891 for non-lock plug. Note: 120 V AC is compatible with existing 115 V systems. Field Installation: Not recommended.
- Power Cable: #9986 for 1.8 meter (6 foot) cable, or #9987 for 4.27 meter (14 foot) cable.
- Loop Connection Cable: #9975 for 1.8 meter (6 foot) cable, or #9977 for 4.27 meter (14 foot) cable.
- Character Set Groups: Specify one -- #2956 for standard size character set, #9401 for Large Character - Lines 1-4, or #9402 for Large Character - Lines 1-10.
- Color: #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

M 3642
May 79

Charge

Percent:

Upper Limit Percent:

MLC

Purchase

MMMC

Mdl

5 Yr

$191

$5,775

$31.50

1

226

6,825

38.00

2

4

Maintenance: B

Per Call: 1

Purchase Option: 55%

Useful Life Category: 2

Warranty: B

Upper Limit Percent: 5%

Termination Charge Months: 6

Termination Charge Percent: 25%

* Pilot Test Plan applies.

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IBM 3643 Keyboard Display

Purpose: A combination keyboard and gas panel display terminal for input and output in interactive 3630 Plant Communication System applications, and when attached to an 8100 System.

Model 2: Displays 240 characters ... six rows of 40 characters. Keyboard consists of alphameric, control, and function keys.

Model 3: Displays 480 characters ... twelve rows of 40 characters. Keyboard consists of alphameric, control, and function keys.

Model 4: Displays 1024 characters ... sixteen rows of 64 characters. Keyboard consists of alphameric, control, and function keys.

Model Changes: Available at time of manufacture only.

Highlights:
- Gas panel display with buffer.
- Keyboard options to meet input requirements.
- Operates with manufacturing application programs.
- Accesses control functions.

Prerequisites:
- Either the Alphameric Keyboard (#4772) or the Expanded Alphameric Keyboard (#4774) must be selected to complete the order. See "Special Features."
- A Loop Station Connector on a 3631/3632 or 3842 loop, or 8100 System loop.
- Magnetic Attachment (#4910) must be ordered if the Magnetic Hand Scanner, Magnetic Slot Reader, or Dual Entry Magnetic Slot Reader is to be attached. See "Special Features."

When ordering this machine for attachment to an 8100 System, the section "Terminal Requirements" in the appropriate 8130, 8140 or 8101 pages in "Machines" should be reviewed.

Bibliography: IBM 3630 Plant Communication System - System Description, GA24-3652 ... IBM 3643 Keyboard Display Operating Guide, GA24-3631 ... Introduction to 8100 System.

Customer Setup: The 3643 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:
- Unpacking, placement, set-up and checkout of the 3643 at time of delivery or when relocating the 3643.
- Removing and packing of the 3643 at time of discontinuance.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operations to determine:
- Whether or not continued operation is possible.
- Whether terminal, loop, controller, accessory, or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3643 terminals and accessories.

Maintenance of the 3643 terminals will normally be performed at the installed location.

There is no regularly scheduled IBM preventive maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMC in "Prices" below.

Maintenance courses are offered to the customer for a separate charge.

Physical Environments: The 3643 meets 2, 3 and 4 may be used in industrialized work zones of a wide range of business, industrial and commercial establishments. They can resist:
- Concentrations of certain common, corrosive gases.
- Concentrations of dust, grit and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operational sites.

Vibration and shock associated with shipping, placement, operation and relocation of the terminal for most types of industries.

For environmental specifications refer to the IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675.

SPECIFY:
- Voltage (120 V, AC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. Note: 120 V AC is compatible with existing 115 V AC systems. Field Installation: Not recommended.
- Power Cable: #9986 for 1.8 meter (6 foot) cable, or #9987 for 4.3 meter (14 foot) cable.
- Loop Connection Cable: #9976 for 1.8 meter (6 foot) cable, or #9977 for 4.3 meter (14 foot) cable.
- Color: #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

PRICES:

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</table>


SPECIAL FEATURES

Keyboards -- all keyboards will have a combination of pre-engraved and non-engraved keytops. For the non-engraved functional keys each 3643 will be provided with 3 sets of self-adhesive keytop labels. One set will be pre-printed with commonly used function nomenclature and will have a protective plastic coating applied. Also, a set of blank labels will be provided so that the user may create his own labels. A clear plastic overlay set will provide a protective cover for the blank label set.

ALPHAMERIC KEYBOARD (#4772): A 54-key alphameric section pre-engraved as a typewriter keyboard to the left of a function/transaction keypad. The function/transaction keypad consists of 12 engraved and 8 non-engraved keys. Limitation: Cannot be installed with Expanded Numeric Keyboard (#4774). Maximum: One. Field Installation: Available at time of manufacture only.

EXPANDED ALPHAMERIC KEYBOARD (#4774): The same as #4772, except that function/transaction keypad has 20 additional non-engraved keys. Maximum: One. Limitation: Cannot be installed with #4774. Field Installation: Available at time of manufacture only.


Special Feature Prices:

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<td>Magnetic Attachment</td>
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<td>318</td>
<td>1.50</td>
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</table>

Accessories: The following items are available on a purchase only basis. For shipment with the machine order the Feature Number and quantity as shown below at the price listed in the M 10000 pages. See M 10000 pages for additional information and for ordering.

<table>
<thead>
<tr>
<th>Item</th>
<th>Feature Number</th>
<th>Maximum Qty</th>
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</thead>
<tbody>
<tr>
<td>Magnetic Hand Scanner</td>
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<tr>
<td>Magnetic Slot Reader</td>
<td>9441</td>
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<td>Dual Entry Mag Slot Reader</td>
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<tr>
<td>Magnetic Reader Extension Cable</td>
<td>9106</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9107</td>
<td></td>
</tr>
</tbody>
</table>

- A maximum of one magnetic reader or scanner may be ordered.
- A maximum of one extension cable may be ordered.

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IBM 3644 Automatic Data Unit

Purpose: The 3644 attaches to the 3631 or 3632 controller, or 8100 system via its loop features to provide system connection to a variety of distributed sensors, actuators, and production and laboratory equipment.

Highlights:
The unit provides:
- Power and housing for Sensor I/O cards.
- Distributed attachment of user equipment.
- Analog and digital attachments.
- Bit serial asynchronous current loop.
- User defined scan controls, data transmission and logic processing.

Limitations: The analog input function requires multiple Sensor I/O cards. If analog input is installed, some card-socket usage restrictions exist. See M 10000 pages for details.

Accessories: See M 10000 pages for descriptions of the Sensor I/O cards.

Prerequisite: A Loop Station Connector on a 3631/3632 or 3642 loop, or 8100 System loop.

When ordering this machine for attachment to an 8100 system, the "Terminal Requirements" listed in the appropriate 8100 System manual should be reviewed.

Bibliography: IBM Plant Communication System - System Description, GA24-3665 ... IBM 3644 Automatic Data Unit - Component Description Manual, GA24-3655 ... IBM 3644 Automatic Data Unit - Programming Guide, GA24-5178 ... IBM 3644 Automatic Data Unit Operating Guide, GA24-3682.

Customer Setup: The 3644 is designated customer setup (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:
- Unpacking, placement, set-up and checkout of the 3644 at time of delivery or when relocating the 3644; this includes the Sensor I/O cards.
- Removing and packing of the 3644 at time of discontinuance.
- Using and following the problem determination procedures of the 3644 and filling out the trouble report prior to calling for service.
- Executing the problem determination procedures for the Sensor I/O cards, determining the failing card, and mailing it to the honoring IBM location.
- Maintenance of the process sensors, actuators, and wiring.
- Determining and stocking spare Sensor I/O cards.
- Creating the parameter tables that direct the operation of the 3644.
- Installation and physical planning for the 3644. IBM assistance in determining the suitability of the industrial environment for the 3644 installation is available.
- Relocation of the 3644 (if required) to allow IBM service access.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operations to determine whether or not continued operation is possible.

Whether terminal, loop, controller, sensor I/O cards, or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3644 terminals.

Maintenance of the 3644 terminals will normally be performed at the installed location.

Warranty service of the Sensor I/O cards will be performed at the honoring IBM location. See M 10000 pages for details.

There is no regularly scheduled IBM preventative maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in "Prices" below.

Maintenance courses are offered to the customer for a separate charge.

Physical Environments: The 3644 and its Sensor I/O cards have been designed to operate in the industrialized work zones of many types of establishments.

They can resist:
- Concentrations of certain common corrosive gases.
- Accumulations of dust, grit and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operational sites.
- Vibration and shock associated with the shipping operation and relocation of the terminal for most types of industries.

For environmental specifications refer to the IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675.

SPECIFY: [1] Voltage (120 V AC, 1-phase, 60 Hz): #9990 for locking plug, or #9991 for non-lock plug. Note: 120 V AC is compatible with existing 115 V AC systems. Field Installation: Not recommended.

[2] Power Cable: #9986 for 1.8 meters (6 foot) cable, or #9987 for 4.3 meters (14 foot) cable.

[3] Loop Connection Cable: #9976 for 1.8 meters (6 foot) cable, or #9977 for 4.3 meters (14 foot) cable.

[4] Color: #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

[5] Distribution of 3644 Microcode: One copy of the 3644 microcode for machines with feature #4905 and/or one copy of the 3644 microcode for machines without feature #4905 is required at each S/370 or 8100 system location.

For the initial shipment must be supplied as a Supplementary Specify:
- #9491 - for initial 3644 without MIO feature.
- #9492 - for initial 3644 with MIO feature (#4905).
- #9493 - for any additional 3644s.

For distribution of microcode to a S/370 location specify media:
- #9412 - 9/800 magnetic tape.
- #9413 - 9/1600 magnetic tape.
- #9414 - 9/6250 magnetic tape.

For distribution of microcode to an 810U system location specify media:
- #9415 - Diskette 1.

PRICES: MLC Mdl M 5 Yr Purchase* MMMC

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<th>3644</th>
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Machine Group: D Per Call: 1 Purchase Option: 55%
Useful Life Category: 2 Warranty: B Upper Limit Percent: 5%
Termination Chg Mnths: 6 Termination Chg Percent: 20%

SPECIAL FEATURES

MANUAL I/O (#4905). Provides a 22-character display and a 35-key numeric/function keypad. Allows inquiry into customer data and status contained in 3644 storage when online to the 3630 system. When offline, additionally allows modification of customer data locations to effect operator control of 3644 operation.

MLC Special Feature Prices: 5 Yr Purchase MMMC

| 3644 | #4905 | $45 | $1,480 | $6.50 |

MLC Accessory: The following items are available on a purchase only basis. For shipment with the machine order the Feature Number and quantity as shown below at the price listed in the M 10000

* Pilot Test Plan applies.
IBM 3645 PRINTER

Purpose: A receive-only printer for printed output in interactive 3630 Plant Communication System applications.

The 3645 is a 120 cps maximum bi-directional printer.

Note: Actual printer throughput is dependent on system and application characteristics.

Highlights:
The 3645 provides a hard-copy output on a variety of forms to meet plant floor printing requirements. Th printer is a bi-directional matrix printer with electronic tabulation and indexing. Line spacing is 8 lines per inch. Up to 4 part cut forms can be used with standard friction feed. For continuous forms, the Formater (#8700) or the Formater with Separator Bar (#8701) is recommended. Card stock forms are not recommended.

Two printing feature options are provided:

- Character Print - Standard (#1501) provides basic character size printing (approximately 0.072 inch wide by 0.117 inch high). The printer character dot matrix is four of seven wide by eight high. The maximum print line is 132 positions. Character spacing is ten to the inch.

- Character Print - Large (#1502) provides four character size printing options under program control.

Basic character size (approximately 0.072 inch wide by 0.117 inch high), and approximately two times standard, four times basic size, and eight times standard size.

Intermix of printing sizes on a single line is not permitted.

The 3645 has been designed to operate in most industrial and commercial environments. It attaches to a 3631 or 3632 Plant Communication Controller via a local 9600 bps loop. The 3645 also attaches to a 3632 Loop Control Unit via a 2400 bps loop, or 8100 System Loop.

Two variable width forms tractors are available...

Supplies: A black ribbon, Part No. 1136653 or equivalent, is required.

Prerequisites:
- A Loop Station Connector installed on a 3631/3632 or 3842 or 8100 System Loop.
- Either Character Print - Standard (#1501) or Character Print - Large (#1502) must be specified...

When ordering this machine for use with an 8100 System, the "Terminal Requirements" on the appropriate 8130, 8140 or 8101 machine page should be reviewed.

Forms Specification: Refer to Form Design Reference Guide for Printers, GA24-3588... use 3767 specifications.

Bibliography: IBM 3630 Plant communication System - System Description, GA24-3852.

Customer Setup: The 3845 is designated customer setup (CSU), thereby offering the customer early availability and relocation flexibility.

Customer Responsibilities: The customer is responsible for:

- Unpacking, placement, setup, and checkout of the 3845 at time of delivery, or when relocating the 3845.

- Removal and packing of the 3845 at time of discontinuance.

- Using and following the problem determination procedures and filling out the trouble report prior to calling for service.

- Relocation of the 3845 (if required) to allow IBM service.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operation to determine:

- Whether or not continued operation is possible

- Whether terminal, loop, controller, accessory, or media is at fault.

Proper Terminal operator use of PDPs will result in maximum terminal and system availability.

Maintenance: The standard maintenance agreement applies to the 3845 Printer.

This maintenance of the printer will normally be performed at the installed location.

There is no regularly scheduled IBM preventive maintenance.

If purchased, the terminals are eligible for maintenance coverage immediately following expiration of the warranty period at the monthly charge shown under MMMC in "Prices."

Maintenance courses are offered to the customer for a separate charge.

Physical Environment: The 3845 may be used in industrialized work zones of a wide range of business, industrial, and commercial establishments.

It can resist:
- Concentration of certain common, corrosive gases.
- Accumulations of dust, grit, and dirt.
- Temperature and relative humidity extremes that are common to terminal operational sites for most industries.
- Most industrial types of electromagnetic interference associated with terminal operational sites.
- Vibration and shock associated with shipping, placement, operation, and relocation of the terminal for most types of industries.

For environmental requirements refer to IBM 3630 Plant Communication System Installation Manual - Physical Planning, GA24-3675.

SPECIFY

- Voltage (120 V AC, 1-phase, 60 Hz): #0980 for locking plug, or #9981 for non-lock plug. Note: 120 VAC is compatible with existing 115 V AC systems. Field installation: Not recommended.
- Power Cable: #9986 for 1.8 meter (6 foot) cable, or #9987 for 4.3 meter (14 foot) cable.
- Loop Cable: #9976 for 1.6 meter (6 foot) cable, or #9977 for 4.3 meter (14 foot) cable.
- Color: #9083 for classic blue, #9084 for charcoal brown, or #9085 for pebble gray.

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Machine Group: D  Per Call: 1  Purchase Option: 55% Useful Life Category: 2 Warranty: B Upper Limit Percent: 5% Termination Chg Month: 6 Termination Chg Percent: 20%

SPECIAL FEATURES

CHARACTER PRINT - STANDARD (#1501). Provides dot matrix character size approximately 0.072 inch wide by 0.117 inch high at 10 characters per inch. Limitation: Cannot be installed with Character Print-Large Feature (#1502). Maximum: One. Field installation: Yes.

CHARACTER PRINT - LARGE (#1502). Provides four character size printing options under program control. Standard - approximately 0.072 inch wide by 0.117 inch high at 10 characters per inch, and approximately two times standard size, four times standard size, and eight times standard size. Intermix of printing sizes on a single line is not permitted. Limitation: Cannot be installed with Character Print - Standard (#1501). Maximum: One. Field installation: Yes. Prerequisite: Variable Width Forms Tractor (#8700) or Variable Width Forms Tractor with Separator (#8701).

VARIABLE WIDTH FORMS TRACTOR (#8700). A forms feeding...
IBM 3646 SCANNER CONTROL UNIT

Purpose: The 3646 allows attachment of Magnetic Hand Scanners or Magnetic Slot Readers for rapid, accurate data collection. The standard 3646 can attach up to two magnetic readers, Magnetic Hand Scanners or Magnetic Slot Readers. Two additional magnetic readers can be attached via the optional Magnetic Reader Attachment (#B351). Each magnetic reader can be addressed independently.

Specifications: A maximum of 4 extension cables may be ordered. For maintenance of 3646 accessories, refer to the IBM 3630 Plant Communication System Operation Manual - Physical Planning, GA24-3675.

Price List:

<table>
<thead>
<tr>
<th>Item Code</th>
<th>Feature Price</th>
<th>MLC 3646</th>
<th>Purchase</th>
<th>MLC 3646</th>
<th>Purchase</th>
</tr>
</thead>
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<tr>
<td>3646</td>
<td>$78</td>
<td>$2,555</td>
<td>$1</td>
<td></td>
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Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

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Machine Group: A

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Purchased Option: 55%

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Per Call: 1

Purchased Option: 55%

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Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

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Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%

Machine Group: A

Per Call: 1

Purchased Option: 55%
Purpose: A data entry terminal designed for attendance and other data entry labor reporting applications.

Highlights

- The 3647 is designed for attendance, labor reporting and other applications.
- Two optional features are available:
  - Function Switch ... a six-position rotary switch that is customer definable.
  - Control Feature ... provides control signals to allow door openings, audible alarms, etc.

An optional magnetic slot reader mounting bracket accessory provides attachment for a slot reader. This mounting bracket is firmly attached to the 3647 via a keylock. The slot reader cable is coiled within the bracket. See "Accessories" below.

The 3647 can be table or wall mounted. An optional wall mounting bracket accessory is available. See "Accessories" below.

The 3647 provides:

- Time of Day Clock -- the initial time is set under program control and can be set for a 12 or 24 hour clock with time displayed in hours and minutes, or hours and hundreds of hours.
- Input Buffer -- an input buffer mode of operation can be selected to store multiple input messages. This provides a high walk-by rate and allows input when the controller, loop, or data link is inoperative. A no-buffer mode of operation can also be selected to permit interactive processing on each input message.
- Invalid Document Code -- an invalid document code option can be selected which allows input messages to be checked for the presence of a non-numeric character. Input without this character is rejected by the 3647.
- Time Stamping -- a time stamping option can be selected which sends the displayed time of day with each input message transmitted to the controller.

Prerequisites: A loop station connector installed on a 3631 or 3632 Plant Communication Controller or an 8100 Information System loop. For magnetic stripe reading a Magnetic Slot Reader, Dual Entry Magnetic Slot Reader, or a Magnetic Hand Scanner is required ... see "Accessories" below.

Customer Set-up: The 3647 is designated Customer Set-up (CSU) thereby offering the customer early availability and relocation flexibility.

Customer Responsibility: The customer is responsible for:

- Unpacking, placement, set-up and checkout of the 3647 at time of delivery or when relocating the 3647.
- Removing and packing of the 3647 at time of discontinuance.
- Filling out the trouble report prior to calling for service.
- Proper terminal operator use of the 3647, however there is no regularly scheduled IBM preventive maintenance.

Maintenance: The standard maintenance agreement applies to the 3647, however there is no regularly scheduled IBM preventive maintenance.

Maintenance of the 3647 will normally be performed at the installed location.

Problem Determination Procedures: Terminal problem determination procedures (PDPs) prompt retry and recovery actions and the analysis of operations to determine:

- Whether or not continued operation is possible.
- Whether terminal, loop, controller, accessory, or media is at fault.

Proper terminal operator use of PDPs will result in maximum terminal and system availability.

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IBM 3651 STORE CONTROLLER MODELS - PROGRAMMABLE STORE SYSTEM

Purpose: The control units for a 3650 Programmable Store System; through standard retail functions tailored by the customer to the customer’s own requirements, and/or customer supplied super-market application programming, the 3651 controls the operation of the 3650 Programmable Store System and its related terminals and provides for communications with an appropriate S/370 virtual storage processor.

Model A25 5 megabyte integral disk storage. Limited features and processing capability. Supported by Programmable Store System Host Support only. Attaches 3275 mdl 3, 3653 mdl 1 and 1P, and 3663 mdl 1P, 2 and 3P terminals.

Model B25 Same as model A25 except has 9.2 megabyte integral disk storage.

Model A75 5 megabyte integral disk storage. Many features, full processing capability. Supported by Programmable Store System Host Support only. Attaches 3275 mdl 3, 3653 mdl 1 and 1P, 3657 mdl 1, 3784 mdl 1, and 3663 mdl 1P, 2 and 3P terminals.

Model B75 Same as model A75 except has 9.3 megabyte integral disk storage.

Model C75 Same as model A75 except has 18.6 megabyte integral disk storage. The model C75 is physically larger than the model A75 or B75.

Model D75 Same as model A75 except has 27.9 megabyte integral disk storage. The model D75 is the same physical size as the model C75.

* NOTE: The 3651 mdl A25 and B25 Store Controllers provide a lower entry system for those users who do not require the capacity and internal processing capability of the 3651 mdl A75, B75, C75, and D75. The effect of the different internal processing capability upon overall system performance is dependent upon the total system configuration and workload.

Highlights: The 3651 is a modular, programmable unit that provides the link between its attached terminals and the host data processing center. The 3651 is normally used to collect data from the various parts of the system, perform edit, logic, and arithmetic operations on that data and then log and/or forward it to its ultimate destination within the overall system - terminal or data processing center. The 3651 mdl 75 can also communicate with another model 75. Application functions for retail operations via 3653 mdl 1 or 3653 mdl 1P terminals functioning as 3651 mdl 1P terminals are provided as standard. All other applications are performed by customer supplied application programming. In models A25, B25, A75, B75, C75 and D75, customer supplied super-market and/or retail application programs may be used along with or instead of the standard retail operations.

Standard features include the following:

Loop Adapter:
Model 25 - Provides for attachment of one in-store local loop.
Model 75 - Provides for attachment of one in-store local loop and one additional loop which may be specified as local or remote (see Figure 1).

Controller Storage: The basic 3651 contains storage optionally expandable via special features (see Special Features below). System configuration as well as user programs determine if additional storage increments are required.

Basic Storage Maximum Storage
Model 25 61,440 bytes 77,824 bytes
Model 75 61,440 bytes 126,976 bytes

Integral Disk Storage — The Integral Disk Storage is used for storage of selected controller functions, user written application programs, system configuration data, data logging and data sets (files).

<table>
<thead>
<tr>
<th>Model</th>
<th>Model 25 (5MB)</th>
<th>Model 25 (9.2MB)</th>
<th>Model 75</th>
<th>Model D75 (5MB)</th>
<th>Model D75 (9.3MB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bytes per Track</td>
<td>15,360</td>
<td>15,360</td>
<td>15,360</td>
<td>15,360</td>
<td>15,360</td>
</tr>
<tr>
<td>Tracks per Cylinder</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Bytes per Cylinder</td>
<td>30,720</td>
<td>30,720</td>
<td>30,720</td>
<td>30,720</td>
<td>30,720</td>
</tr>
<tr>
<td>Cylinders per IDS</td>
<td>16</td>
<td>301</td>
<td>301</td>
<td>602</td>
<td>602</td>
</tr>
</tbody>
</table>

Storage Capacity: Moveable Head 5,130,240, 9,246,720, 18,493,440, 27,740,160, Fixed Head (Mdl 75 only) 122,880, 122,880, 245,760, 368,640

Host Communications Adapter — provides for transmission to and from a properly equipped S/370. The basic transmission rate is 2400 bps over switched or non-switched networks with 4800 bps as a specialty option. This adapter interfaces to appropriate IBM modems. With the appropriate features available on model 75 only, the Host Communications Adapter can communicate with another 3650 Programmable Store System or local attachment to a 3704 or 3705... see "communications Facilities" below and M 2700 pages.

To communicate with another 3650 system or local attachment to 3704 or 3705, see Special Features below.

Audible Alarm — activated when predetermined events require operator attention or intervention for system operation. A contact closure to which the customer can attach his remote alarm is available as an option with 3669 Attachment (see 3669 Attachment in Special Features below).

Controller Storage Save (Model 75 only) — critical areas of controller storage are automatically written on the integral disk unit when power is turned off or a power failure is detected.

Terminal Devices: The terminals which are identified above under the different models of the 3651 are attached to the 3651 via Local/Remote Loop Adapter. A maximum of 191 terminals can be addressed by the 3651. However, the number of terminals which can be supported depends upon traffic volumes, desired response times, applications to be performed, and the model of the 3651.

One 3764 Line Printer mdl 1 can be attached to the 3651 model 75 control unit.

Communications Facilities: The Host Communications Adapter (mdl 25 and 75), Auxiliary Communications Adapter (as 6185 - mdl 75 only) and 3669 Attachment (as 8069 - mdl 75 only) permit operation at the speeds indicated, over the facilities shown below, with the hardware and software modules that are required in accordance with those shown on the charts on those pages.

At 2400 bps ... on facility C5, C30, C31, D4, D24, D435 or X1M. At 4800 bps ... on facility C8, C9, C65, D65, D355 or X2M. NOTE: Neither the auxiliary communications adapter or the 3669 attachment can operate at 4800 bps.

PREREQUISITES: At the host location, a virtual storage S/370 Processor with properly equipped 3704 or 3705 (or BCA communications) ... see M 2700, 3704, 3705 pages.

SPECIFY: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug — #9884 for 208 V or #9886 for 230 V. Non-lock plug — #9865 for 208 V or #9867 for 230 V.

[2] Modem Attachment Host Communications Adapter: One IBM modem can be attached to this adapter on the 3651. The 3651 provides a cable and interface for connection of IBM modems which at transmission rates of 2400 bps or 4800 bps for communications with the S/370. If switched network is selected, auto answer capability is standard. If leased operation is selected, dial back-up is provided on a manual dial basis using the IBM 3872 or 3874 Modem with appropriate special features. 8-Wire Switched Network Backup is available with the 3863 mdl 1 and 3864 mdl 1.

Specify Code Speed (bps) IBM Modem
#9120 2400 3872 3663
#9121 2400 (2) 3872 3663
#9122 2400 (3) 3872 3663
#9123 4800 (2) 3874 3664
#9124 4800 (3) 3874 3664
#9125 4800 3874 3664
#9126 4800 3874 3664

NOTES: For communications capabilities, product description and special features, see 3863, 3864, 3872, 3874 and M 2700 pages.

(2) Point-to-point network.
(3) Multipoint network.

[3] System Attachment: Identify the host processor(s) for the 3650 Retail Store System by specifying the following codes:

<table>
<thead>
<tr>
<th>Processor Code</th>
<th>Code</th>
<th>Processor Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>3115</td>
<td>#9599</td>
<td>3148</td>
</tr>
<tr>
<td>3125</td>
<td>9586</td>
<td>3155 II</td>
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<tr>
<td>3135, 3135-3</td>
<td>9581</td>
<td>3158</td>
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<tr>
<td>3138</td>
<td>9580</td>
<td>3158 II</td>
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<td>3145, 3145-3</td>
<td>9582</td>
<td>3168</td>
</tr>
<tr>
<td>3033</td>
<td>9592</td>
<td></td>
</tr>
</tbody>
</table>

[4] Controller Designation: Specify #9491 on the first 3651 mdl 25 or 75 to be used with a host system location requiring 3650 Programmable Store System Host Loop. Specify #9492 on each additional 3651 mdl 25 or 75 in the network. Specification of #9491 will result in controller data (DTR) being sent to host.
3651 Store Controller Models - Programmable Store System (cont’d)

location. When #391 is specified, additional information must be specified as follows:

1) Specify one of the following to indicate magnetic tape density (media) used at the host system location. The tape media is available under DOS/VS, OS/VS1 and OS/VS2 only.

- #9412 - 9-track 800 bpi.
- #9413 - 9-track 1500 bpi.
- #9414 - 9-track 6250 bpi.

If magnetic tape is not used at the host system, specify one of the following media which are available under DOS/VS only.

- #9421 - 2316 Disk Pack.
- #9422 - 3336 Disk Pack Mdl I
- #9423 - 3336 Disk Pack Mdl II
- #9424 - 3348 Data Module

The 3651 controller data will be sent via the specified media to the IBM Programming Systems Representative at the request of your system location for installation. If disk media is required, the IBM disk will be returned to the plant location after installation of the controller data.

2) Note: The corresponding release of IBM OS/VS1 or VTAM or BTAM, and availability under DOS/VS only.

3) Model changes require the replacement of the integral disk storage. Adequate provision must be made for retaining data contained on the replaced disk storage at the host location so it can be transmitted to the new disk storage.

4) Termination Charge Months: 5 Termination Charge Plan Upper LOCATION. Be specified as

- #8069 - 9600 BPS Loop Adapter (#4882) or Remote Loop Adapter (#6111) or the 3651 mdl A60 or B60 with Storage Increment (#7680) should consider the model A75 or B75 initially as field conversions to the model A75 or B75 require the replacement of these features.

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**Customer price quotations and customer order acknowledgement letters for purchase must state: “Installation of this model change involves the removal of parts which become the property of IBM.”

Note 1 Customers who elect to purchase the 3651 mdl A50 or B50 with Storage Increment Type I (#1550) and/or second Additional Loop (#4882, #4890 or #6111) or the 3651 mdl A60 or B60 with Storage Increment (#7680) should consider the model A75 or B75 initially as field conversions to the model A75 or B75 require the replacement of these features.

**Special Features

Control Storage Features - the amount of be ordered is dependent upon the number and type of terminals attached to the system as well as system configuration and user programs.

For available storage configurations, see Table A below.

Storage Increment - Type II (#1564). [Mdl A75, B75, C75, or D75 only] Each #1564 provides the 3651 with an additional 16384 positions of storage. Maximum: Three (see Table A). Field Installation: Yes. Prerequisites: The 3651 must be equipped with Storage Expansion Feature (#1570) and First Storage Increment (#1571).

Storage Expansion Feature (#1570). Provides the capability of expanding storage beyond 61440 bytes. Maximum: One. Field Installation: Yes. Note: First Storage Increment (#1571), or First Storage Increment (#1571) and Storage Increment - Type II (#1564) are required to provide the appropriate additional positions of storage (see Table A). Maximum: One. Field Installation: Yes. Prerequisite: Storage Expansion Feature (#1570).

**Table A**

Storage Configuration Feature Distribution

<table>
<thead>
<tr>
<th>Total Storage</th>
<th>Storage Expansion</th>
<th>First Storage Increment</th>
<th>Storage Increment Type II</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A) 61,440</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>(B) 77,924</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>(C) 94,208</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>(D) 110,529</td>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

**IML-WRITE ADAPTER (#4633).** Provides the 3651 with the ability to write an IML (Initial Machine Load) tape on a user provided tape cassette recorder to be read by a Point of Sale terminal equipped with the IML-Read Adapter (#4632) feature. Maximum: One. Field Installation: Yes.

**Local Loop Adapter, Additional (#4802).** [Mdl A75, B75, C75, D75 only] Provides an additional Local Loop Adapter as the third loop on the 3651. The actual number of terminals that can be attached will depend upon the program capacity and time requirements of the 3651 to service the loops as well as the communications link to the S/370 ... see ‘Terminal Devices’ above. Specify: See Figure 1. Maximum: One. Field Installation: Yes. Limitation: Not available on the 3651 when 9600 bps Loop Adapter (#4890) or Remote Loop Adapter (#6111) is installed. Provides a 9600 bps Local Loop Adapter as the third loop. The feature provides for the attachment of 3275 Display Station.
3651 Store Controller Models - Programmable Store System (cont'd)

mdl 3s with 9600 bps Transmission Speed (#7825) feature installed. The actual number of 3272 Display Station mdl 3s installed will depend upon program capacity and time requirements of the 3651 to service the loops and the communications link to the S/370 ... see "Terminal Devices" above. Limitations: Not available if Local Loop Adapter, Add'l (#4890) or Remote Loop Adapter (#6111) is installed. Only 3272 Display Station mdl 3s with 9600 bps Transmission Speed (#7825) can be attached to this Loop Adapter. Specify: See Figure 1. Maximum: One. Field Installation: Yes.

REMOTE LOOP ADAPTER (#6111). [Mdl A75, B75, C75, D75 only] Provides a Remote Loop Adapter as the third loop on the 3651 for online service for up to twelve remote sites per Remote Loop Adapter. The feature provides an interface to an IBM 3872 Modem on site which via leased line connects to a 3659 Remote Communications Unit at each remote site. This allows for the extension of the loop to up to (1) three remote locations, with a 3659 mdl 1 at each site, (2) twelve remote locations, with a 3659 mdl 2 (multipoint) at each site, (see "Terminal Devices" above). The 3651 treats the remote loop as if it were a local loop. Limitations: Not available if Local Loop Adapter, Add'l (#4892) or 9600 BPS Loop Adapter (#4890) is installed. Specify: See Figure 1. Maximum: One. Field Installation: Yes. Prerequisites: One IBM 3672 Modem with Point-to-point (#6101 or #6102) feature per Remote Loop Adapter at 3651 site and a 3659 Remote Communications Unit at each remote site. When more than one remote site is attached using 3659 mdl 1, a half-duplex 2-wire terminated, non-switched voice grade line is required between the 3651 and the first remote site between successive remote sites, and from the last remote site back to the 4-wire terminated, non-switched voice grade line is required. When using the 3659 mdl 2 for more than one remote site, 4-wire duplex multipoint service is required. The 3659 mdl 2 requires that the 3672 be a basic control station (no special feature(s)) or equipped with Second Modem (#6302). AUXILIARY COMMUNICATIONS ADAPTER (#6185). [Mdl A75, B75, C75, D75 only] Provides a separate 2400 bps communications interface which can operate independently of the Host Communications Adapter. It can be used for either of the following but not both:

a. 3651-75 to 3651-75 communications.

b. Communications with another 3650 system via a 3669 Store Communications Unit.

Maximum: One. Field Installation: Yes. Limitations: Only one Auxiliary Communications Adapter (#6185 or #6186) allowed per 3651-75, not allowed with 3669 Attachment (#8069) with Specify #9200 for Host Communications Adapter. Prerequisites:

a. For 3651-75 to 3651 communications
   1. A 3872.
   2. Another 3651-75 similarly equipped.
   b. For backup with another 3650 system
   1. 3669 Attachment (#8069) with specify #9210.
   2. A 3659 Store Communications Unit.

AUXILIARY COMMUNICATIONS ADAPTER SYNCHRONOUS CLOCK (#6188). [Mdl A75, B75, C75, D75 only] Provides a 2400 bps communications interface which operates independently from the Host Communications Adapter to allow direct communications with another 3651-75 with the same feature without the use of modems. Maximum: One. Field Installation: Yes. Limitations: Only one Auxiliary Communications Adapter (#6185 or #6186) allowed per 3651-75, not allowed with 3669 Attachment (#8069). Prerequisite: Another 3651-75 with #6188.

SYNCHRONOUS CLOCK - HOST (#7708). [Mdl A75, B75, C75, D75 only] Provides clocking from the Host Communications Adapter allowing the direct attachment to a local 3704 or 3705 at 2400 bps. Maximum: One. Field Installation: Yes. Prerequisite: The 3704 or 3705 must be equipped with Line Set, Type 1F (#4715). Note: A 6 meter (20 foot) external cable is provided which connects to the 3704/3705 cable.

3669 ATTACHMENT (#8069). [Mdl A75, B75, C75, D75 only] Provides the capability to attach one 3669 Store Communications Unit which allows communications over switched networks at 2400 bps with another 3650 system, and alternately with a S/370 host processor. This feature can be provided for use with either the Host Communications Adapter or the Auxiliary Communications Adapter (#6185), but not with both. Limitation: When used with Auxiliary Communications Adapter (#6185), it cannot communicate with a host processor. Specify: (1) #9200 for use with Host Communications Adapter, #9210 for use with Auxiliary Communications Adapter (#6185) ... (2) #9220 if local audible alarm is desired when operator attention is required. Maximum: One. Field Installation: Yes. Prerequisites: (1) Local Loop Adapter, specify #9442 ... (2) a 3669 Store Communications Unit.

3784 ADAPTER (#8154). [Mdl A75, B75, C75, D75 only] Provides the capability to directly attach one 3784 Line Printer mdl 1 to the 3651 controller. The 3784 mdl 1 must be located within 15 feet of the controller. Maximum: One. Field Installation: Yes. Prerequisites: Specify feature #9716 must be specified on the 3784 mdl 1 for attachment of the 3784 to the 3651 mdl A75 and B75 and #9717 for attachment to the 3651 mdl C75 or D75.

<table>
<thead>
<tr>
<th>Loop Adapter Position</th>
<th>Loop Adapter Position</th>
<th>Special Feature</th>
<th>Specify</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Add'l Local</td>
<td>#4942</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Add'l Local</td>
<td>#4952</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Remote</td>
<td>#4982</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Remote</td>
<td>#4982</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Remote</td>
<td>#4982</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>9600 bps</td>
<td>#4980</td>
<td></td>
</tr>
</tbody>
</table>

* Loop Adapter position 1 is occupied by the standard Local Loop Adapter. Loop Adapter position 2 is standard and must be specified as Local (#4942) or Remote (#4952). If Loop Adapter position 2 is specified as remote, see Remote Loop Adapter (#6111) for prerequisites which will apply. For Loop Adapter position 3, either an Add'l Local (#4952) or Remote (#6111) or 9600 bps (#4980) Loop Adapter may be ordered.

Special Feature Prices:

<table>
<thead>
<tr>
<th>MAC/MLC</th>
<th>ETP/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 yr Purchase MMMC</td>
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<tr>
<td>Storage</td>
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<tr>
<td>Stor Increment Type II</td>
<td>31564</td>
<td>58</td>
<td>49</td>
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<tr>
<td>Stor Expansion Feature</td>
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<td>33</td>
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<td>1st Storage Increment</td>
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<td>IML-Write Adapter</td>
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<td>Local Loop Adptr, Add'd</td>
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<td>9600 bps Loop Adapter</td>
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<tr>
<td>Aux. Comm. Adapter</td>
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<td>43</td>
<td>37</td>
</tr>
<tr>
<td>Aux. Comm. - Synchronous Clock</td>
<td>6188</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>Synch Clock-Host</td>
<td>7708</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>3669 Attachment</td>
<td>8089</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>3784 Adapter</td>
<td>8154</td>
<td>68</td>
<td>75</td>
</tr>
</tbody>
</table>

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IBM 3651 STORE CONTROLLER MODELS A50 and B50

Purpose: Through its standard functions, tailored by the customer to the customer's own requirements, the 3651 controls the operation of the 3650 Retail Store System and its related terminals and provides for communications with an appropriate S/370 or 4300 virtual storage processor.

Model A50: 5 megabyte integral disk storage
Model B50: 9.3 megabyte integral disk storage

Highlights: The 3651 is a modular, programmable unit that provides the link between point-of-sale (3655), receiving-marking (3275 mld 3 and 3657), and the host data processing center. The 3651 collects data from the various parts of the retail system, performs edit, logic, and arithmetic operations on that data and then logs and/or forwards it to its ultimate destination within the overall system-terminal or data processing center. The 3651 also communicates with its attached terminals on an interactive basis and processes inquiries against its files.

Standard features include the following:
- Local Loop Adapter -- provides for the attachment of one in-store loop.
- Controller Storage -- the basic 3651 contains storage optionally expandable via special features to 106,496 bytes (see Special Features below). System configuration as well as user programs determine if additional storage increments are required. Operation with many user programs will require the additional storage increments.
- Integral Disk Storage -- the Integral Disk Storage is used for storage of selected controller functions, user-written application programs, system configuration data, data logging and data sets (files).

Model A50 (5 MB) Model B50 (9.3 MB)

| Bytes per Track | 15,360 | 15,360 |
| Tracks per Cylinder | 2 | 2 |
| Bytes per Cylinder | 30,720 | 30,720 |
| Cylinders per IDS | 167 | 301 |
| Storage Capacity | 5,130,240 | 9,246,720 |
| Moveable Head | 122,880 |
| Fixed Head | 122,890 |

Host Communications Adapter provides for transmission to and from a properly equipped S/370 or 4300 Processor. The basic transmission rate is 2400 bps over non-switched or switched networks with 4800 bps as a specify option. This adapter interfaces to appropriate IBM modems and see "Communications Facilities" below and M 2700 pages.

For local attachment to 3704, 3705 or Communications Adapter on 4331 Processor, see Special Features below.

Audible Alarm -- activated when predetermined events require operator attention or intervention for system operation.

Controller Storage Save -- critical areas of controller storage are automatically written on two areas of the integral disk unit when power is turned off or a power failure is detected.

Terminal Devices: The following terminals are attached to the 3651 Store Control via Local/Remote Loop Adapter -- 3655 Point of Sale Terminal, 3275 mld 3 Display Station, and the 3657 Ticket Unit. Local Loop adapter number one can address 63 terminals and the other two Loop adapters (local or remote) can each address 64 terminals. However, the number of terminals which can be supported on each loop depends upon traffic volumes, desired response times, and applications to be performed. One 3784 Line Printer mld 1 may be attached to the 3651 controller unit.

Communications Facilities: The communications adapter permits operation at the speeds indicated, over the facilities shown below, when using the appropriate modem. For information concerning the facilities, see M 2700 pages. The alphanumerical communications facility references below correspond to those shown on the charts on those pages.

At 2400 bps ... on facility C5, C5M, D4, D4M, D4SB or X1M At 4800 bps ... on facility C6, C6M, D5, D5M or X2M

PREREQUISITES: A 3704 or 3705 in 2701, 2703 Emulation Mode for BSC systems and in NCP/VSP mode for SDLC systems (with appropriate features ... see M 3704 and 3705 pages) attached to any virtual storage S/370 or 4300 Processor. Also attaches via a Communications Adapter feature on the 4331 Processor ... see M 4331 pages for details.

SPECIFY: [1] Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9684 for 208 V, or #9588 for 230 V. Non-locking plug -- #9885 for 208 V, or #9987 for 230 V.

[2] Modem Attachment Host Communications Adapter: One IBM modem can be attached to this adapter on the 3651. The 3651 provides a cable and interface for connection of IBM modems at transmission rates of 2400 or 4800 bps for communications with the S/370 or 4300 Processor. If switched network is selected, auto-answer capability is standard. If leased point-to-point operation is selected, dial-up-back is provided on a manual dial basis using the IBM 3863, 3864 or 3872 Modem with appropriate special features.

Specify Code Speed (bps) IBM Modem
#9120 2400 (2) 3872 1463
#9121 2400 (2) 3872 1463
#9122 2400 (3) 3872 1363
#9124 4800 (2) 3874 3664
#9125 4800 (3) 3874 3664
#9126 4800 3874 3664

Notes: (1) For communications capabilities, product description and special features, see 3863, 3864, 3872, 3874 and M 2700 pages.

(2) Point-to-point network.

(3) Multipoint network.

[3] System Attachment: Identify the host processor(s) for the 3650 Retail Store System by specifying the following codes:

Processor Code Processor Code Processor Code
3115 9559 3148 9591
3125 9556 3156 9583
3135 3135-3 9581 3158 9587
3138 9590 3165 9584
3145 3145-3 9582 3166 9588
3033 9592 4331 9506
4341 9607

[4] Controller Designation: Specify #9491 on the first 3651 to be used with a host system location requiring BSC RSS/Host support and on the first 3651 requiring SNA RSS/Host support and specify #9492 on each additional 3651 in the network.

NOTE: #9491 may be specified twice if both BSC and SNA RSS/Host support is required in the network.

When #9491 is specified, additional information must be specified as follows:

1) Specify one of the following to indicate magnetic tape media (media) used at the host system location. The tape media is available under DOS/VSP, OS/VSP and OS/VSP2 only.

   #9412 -- 9-track 600 bpi
   #9413 -- 9-track 1600 bpi
   #9414 -- 9-track 6250 bpi

   If magnetic tape is not used at the host system, specify one of the following media which are available under DOS/VSP only.

   #9421 -- 3316 Disk Pack
   #9422 -- 3336 Disk Pack Mdl I
   #9423 -- 3336 Disk Pack Mdl II
   #9424 -- 3348 Data Modules

   The 3651 controller data will be sent via the specified media to the IBM Programming Systems Representative at the host system location. If disk media is required, the IBM disk will be returned to the plant location after installation of the controller data.

[5] Specify one of the following:

   #9501 -- for 3650 BSC Retail Store System requiring Release I RSS/Host Support. NOTE: Shipments of 3650 Systems requiring Release I Host Support under DOS/VSP BTAM or OS/VSP terminals in December, 1975.

   #9502 -- for 3650 BSC Retail Store System requiring Release 2 or 3 Host Support under DOS/VSP, OS/VSP1 VTAM and OS/VSP2 VTAM. Controllers specified with #9502 have a maximum of 57,344 positions of storage. Shipments of 3651 controllers specified as #9502 will terminate in March, 1976 to new customers and in July, 1976 to existing customers.

   #9503 -- for 3650 SNA Retail Store Systems requiring Re-
3651 Store Controller Models A50 and B50 (cont’d)

lease 3 RSS/Host Support under DOS/VS VTAM, OS/VS1 VTAM and OS/VS2 VTAM. All controllers shipped to new customers after March, 1976 will require RSS/Host Release 3 and should be specified with #9503. NOTE: #9503 is a prerequisite for feature codes #1559, #1560 and #1564.

Note: The corresponding release of 3650 RSS Host Support must be ordered from PID. See SCP pages of the sales manual.

[6] Store Loop Polarity Tester: Order Store Loop Polarity Tester, Part No. 169559, for site of storage wiring. one is furnished at each site at no charge. NOTE: The customer must provide (purchase, install and maintain) all necessary 3650 communications lines within the store. (Bulk Loop Cable is available from IBM. See M10000 pages.)

ETP/PRICES: Mdl MAC/ MLC Storage.

<table>
<thead>
<tr>
<th>Mdl</th>
<th>A50</th>
<th>B50</th>
<th>MAC/ MLC</th>
<th>Storage Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3651</td>
<td>$ 872</td>
<td>$ 742</td>
<td>2 yr</td>
<td>$29,500</td>
</tr>
</tbody>
</table>


Model Changes: Model changes between the models A50 or B50 and the model A60 or B60 are not recommended for field installation. 3651 features cannot be interchanged between models A50 or B50 and model A60 or B60. Model changes between model A50 and B50 can be made in the field. This change requires the replacement of the integral disk storage. Adequate provision must be made for retaining the data contained on the replaced disk storage.

Model changes between the A50 or B50 and the A75 or B75 can be made in the field. See the 3651 model A75 and B75 machine pages. Customers who elect to purchase the 3651 mdl 2 or B75 model A60 or B60. Model changes between model A50 and B50 within the limits of the features installed. The actual number of 3275 Display Stations mdl 2 or B75 requires the replacement of this feature.

On purchased model 50 to model 75 changes either Local Loop Adapter, Additional (#4883 with specific code #5520 or #5543) or Remote Loop Adapter (#1561 with specific code #9522 or #9553) is a prerequisite on the model 50.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model A50 to Model B50 ....... $3,180*  
* Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

SPECIAL FEATURES

Control Storage Features: The amount to be ordered is dependent upon the number and type of terminals attached to the system as well as system configuration and user programs.

For available storage configurations, see Table A below.

STORAGE EXPANSION (#1560). Contains 16,384 positions of storage to provide the capability of expanding storage beyond 57,344 positions to a maximum of 106,496 positions. Maximum: One. Field Installation: Yes. (See Table A) Prerequisite: Specify Feature Code #9503.

STORAGE INCREMENT (#1561). Each #1561 provides the 3651 with an additional 8,192 positions of storage. Maximum: Two. Field Installation: Yes. Limitation: Cannot be installed with #1559, #1564 or #9503. (#1561 not available after July, 1976)

STORAGE INCREMENT - TYPE I (#1559). #1559 provides the 3651 with an additional 8,192 positions of storage. Maximum: One. Field Installation: Yes. (See Table A) Prerequisite: Specify Feature Code #9503.

STORAGE INCREMENT - TYPE II (#1564). Each #1564 provides the 3651 with an additional 16,384 positions of storage. Maximum: Three. Field Installation: Yes. (See Table A) Prerequisite: Specify Feature Code #9503.

TABLE A

<table>
<thead>
<tr>
<th>Storage Configuration</th>
<th>Feature Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Storage</td>
<td>Storage Increment</td>
</tr>
<tr>
<td>(#1561 Pos.)</td>
<td>Type I (#1559)</td>
</tr>
<tr>
<td>(#1559 Pos.)</td>
<td>Type II (#1564)</td>
</tr>
<tr>
<td>(#1564 Pos.)</td>
<td>Storage Expansion</td>
</tr>
<tr>
<td>(#1564 Pos.)</td>
<td>(#1564 Pos.)</td>
</tr>
<tr>
<td>(A)</td>
<td>(B)</td>
</tr>
<tr>
<td>(B)</td>
<td>(C)</td>
</tr>
<tr>
<td>(C)</td>
<td>(D)</td>
</tr>
<tr>
<td>(D)</td>
<td>(E)</td>
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<td>(E)</td>
<td>(F)</td>
</tr>
<tr>
<td>(F)</td>
<td>(G)</td>
</tr>
<tr>
<td>(G)</td>
<td>(H)</td>
</tr>
<tr>
<td>(H)</td>
<td>(I)</td>
</tr>
<tr>
<td>(I)</td>
<td>(J)</td>
</tr>
</tbody>
</table>

Notes: 1. Field installation of Storage Increment - Type I is only to be made with new installation and not with an existing installation. Limitation: Cannot exceed a total of three Loop adapters (local or remote) per 3651. Specify: See Figure 1. Maximum: Two. Field Installation: Yes.

2. Field upgrade from A to B and C to D is allowed via Storage Increment (#1561) through July 30, 1976. However, such a purchase would be advised that Storage Increment (#1561) cannot be used in configurations above 57,344 positions.

IML-WRITE ADAPTER (#4633). Provides the 3651 with the ability to write an IML (Initial Machine Load) tape on a user provided tape cassette recorder (refer to IBM 3650 Retail Store System Introduction Manual, GA27-3075), to be read by a Point of Sale terminal equipped with the IML-Read Adapter (#4632) feature.

Maximum: One. Field Installation: Yes.

LOCAL LOOP ADAPTER, ADDITIONAL (#4882). This feature provides a second or third Local Loop Adapter on the 3651. Up to a maximum of 64 terminals can be attached to each additional Loop. The actual number of terminals will depend upon program capacity and time requirements of the 3651 to service the Loops as well as the communications link to the S/370 or 4300 Processor ... see "Terminal Devices" above. Limitation: Cannot exceed a total of three Loop adapters (local or remote) per 3651. Only 3275 Display Station mdl 3s with 9600 bps Transmission Speed (#7825) can be attached to this Loop adapter. Specify: See Figure 1. Maximum: One. Field Installation: Yes.

REMOTE LOOP ADAPTER (#6111). Provides online service for up to twelve remote sites per Remote Loop Adapter. Available in lieu of a second or third Local Loop Adapter. The feature provides an interface to an IBM 3872 Modem on site which via leased line connects to a 3659 Remote Communications Unit at each remote site. This allows for the extension of the Loop to up to (1) three remote locations, with a 3659 mdl 2 at each site, (2) twelve remote locations, with a 3659 mdl 2 (multipoint) at each site, with a total of 64 terminals per Loop (see "Terminal Devices" above). The 3651 treats the remote Loop as if it were a local Loop. Limitation: Cannot exceed a total of three Loop adapters (local or remote) per 3651. Specify: See Figure 1. Maximum: Two. Field Installation: Yes. Prerequisites: One IBM 3872 Modem with Point-to-Point (#6110 or #6102) feature for Remote Loop Adapter at 3651 site and a 3659 Remote Communications Unit at each remote site. When more than one remote site is attached using 3659 mdl 2, a terminated, ex 2-wire terminated, non-switched voice grade line is required between the 3651 and the first remote site, between successive remote sites, and from the last remote site back to the 3651. When only one remote site is to be attached, a duplex, 4-wire terminated asynchronous voice grade line is required. When using the 3659 mdl 2 for more than one remote site, 4-wire duplex multipoint service is required. The 3659 mdl 2 requires that the 3672 be a basic control station (no special features) or equipped with Second Modem (#6302).
IBM

3651 Store Controller Models A50 and B50

SYNCHRONOUS CLOCK (#7708). Provides clocking from the Host Communications Adapter allowing for direct attachment to a local 3704, 3705 or Communications Adapter on 4331 Processor at 2400 bps. Maximum: One; Field Installation: Yes. Prerequisites: The 3704 or 3705 must be equipped with Line Set, Type 1F (#4716); 4331 must be equipped with Local Attachment Interface (#4801) and prerequisites. Note: A 20' (6 meters) external cable is provided which connects to the 3704, 3705 or 4331 cable.

3784 ADAPTER (#8154). Provides the capability to directly attach one 3784 Line Printer mdl 1 to the 3651 controller. The 3784 mdl 1 must be located within 15 feet of the controller. Maximum: One; Field Installation: Yes. Prerequisites: Specify feature #9716 must be specified on the 3784 mdl 1 for attachment of the 3784 to the 3651. Minimum storage required on the 3651 is 48K. Note: For attachment of the 3784 line printer, the controller must have EC 349850 applied and operating under RRS/Host Support Release 3. New 3651 controllers must have #9503 specified.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Special Feature</th>
<th>MAC/ MLC</th>
<th>2 yr</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage Expansion</td>
<td>#1560</td>
<td>$96</td>
<td>$82</td>
</tr>
<tr>
<td>Storage Increment Type I</td>
<td>1561</td>
<td>32</td>
<td>27</td>
</tr>
<tr>
<td>Storage Increment Type II</td>
<td>1559</td>
<td>32</td>
<td>27</td>
</tr>
<tr>
<td>Storage Increment Type III</td>
<td>1564</td>
<td>58</td>
<td>49</td>
</tr>
<tr>
<td>IML-Write Adapter</td>
<td>4633</td>
<td>12</td>
<td>10</td>
</tr>
<tr>
<td>Local Loop Adptr, Add1</td>
<td>4882</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>9600 bps Loop Adapter</td>
<td>4890</td>
<td>87</td>
<td>74</td>
</tr>
<tr>
<td>Remote Loop Adapter</td>
<td>6111</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td>Synchronous Clock</td>
<td>7708</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>3784 Adapter</td>
<td>8154</td>
<td>88</td>
<td>75</td>
</tr>
</tbody>
</table>

Figure 1

<table>
<thead>
<tr>
<th>Loop Adapter Position</th>
<th>Loop Adapter</th>
<th>Special Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Add1 Local</td>
<td>#4882</td>
</tr>
<tr>
<td></td>
<td>Remote</td>
<td>#6111</td>
</tr>
<tr>
<td></td>
<td>9600 bps</td>
<td>#4990</td>
</tr>
<tr>
<td>3</td>
<td>Add1 Local</td>
<td>#4882</td>
</tr>
<tr>
<td></td>
<td>Remote</td>
<td>#6111</td>
</tr>
<tr>
<td></td>
<td>9600 bps</td>
<td>#4990</td>
</tr>
</tbody>
</table>

* Loop Adapter Position 1 is occupied by the standard Local Loop Adapter. For Loop Adapter Position 2 and 3, either an Add1 Local (#4882) or Remote (#6111) or 9600 bps (#4990) Loop Adapter may be ordered. For each one ordered, also specify the applicable #XXX code from the chart above. The 9600 bps Loop Adapter (#4990) may be ordered only once.

IBM 3651 STORE CONTROLLER - SUPERMARKET

Purpose: The control unit for a 3660 Supermarket System. Controls all functions of the 3663 Supermarket Terminals. A 3669 adapter is included, which allows communications at 2400 bps over appropriate communications facilities with a properly equipped 3750 or 4300 Processor. For backup purposes, the 3651 unit, through the 3669 Communications Unit, can also communicate with and control 3663 Supermarket Terminals in one other preassigned location. See "Communications Facilities" and "Prerequisites."

Model A60 5 megabytes of integral disk storage

Model B60 9.3 megabytes of integral disk storage

Highlights: Up to twenty-four 3663 Supermarket Terminal stations can be attached to a 3651 mdl A60 or B60 in one store. Each 3663 mdl 1 or each 3663 mdl 2 counts as 1 out of the 24. In addition, for backup purposes, a 3651 mdl A60 or B60 can control all the 3663 Supermarket Terminals that are normally controlled by the other preassigned 3651 mdl A60 or B60 (normally at another location).

The 3651 mdl A60 or B60 (using the 3663 Supermarket Terminal) supports the following functions, in most combinations:

Customer Checkout
- Automatic pricing through code lookup in a master price file.
- Automatic handling of multiple priced items.
- Automatic handling of mix and match group pricing.
- Automatic distribution of net sales by department (up to 54).
- Automatic application of transaction discounts.
- Automatic computation of sales taxes with automatic handling of taxable and non-taxable items.
- Provision for tax exempt transactions.
- Automatic control of maximum value of food stamps that should be accepted.
- Check authorization facilities (positive or negative) through lookup against a check authorization record.
- Computation of change and trading stamps due.

All functions can be controlled to inhibit initiation by unauthorized personnel.

Store Support
- Preparation of the following account reports
  - store summary
  - individual cashier performance and tender reconciliation
  - store office tender reconciliation
  - sales by department (up to 54)
  - distribution of miscellaneous income and distributions by account.
- Current inquiries for department sales, cashier performance and cash position, and store cash position.
- Inquiries and changes to master price records and operator authorization control records.
- Setting time and date for the internal clock.
- Customer checkout training mode.
- Printing miscellaneous messages received previously from the host S/370 or 4300 Processor.
- Entry of miscellaneous messages for subsequent retrieval by the host S/370 or 4300 Processor.
- Reporting of items returned by customers which are returned to stock.
- Updating the system with data received from the host S/370 or 4300 Processor.
- Shelf Label Preparation

The above functions are compatible with variable length reconciliation periods, e.g., daily or weekly, and they are compatible with 24 hour store operation. All functions are individually controlled to inhibit initiation by unauthorized personnel.

Data Accumulation

The 3651 mdl A60 or B60 accumulates the following by-product data for subsequent retrieval by the host S/370 or 4300 Processors. Item movement totals, all accounting and performance formats used in store reports, totals of taxes and taxable sales, productivity totals for each terminal station in 15 minute increments, check authorization data requested, and individual logged entries covering coupons received, exception events, and security sensitive events.

Host S/370 or 4300 Processor Transmission

The 3651 mdl A60 or B60 can transmit to the host, upon receiving a request, all of the data shown under "Data Accumulation," and other data, or records in the 3651. The 3651 will clear out data or records upon request by the host. The 3651 can receive

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Communications Facilities: For in-store operation, two store loops provide the communications linkage to the 3663 Supermarket Terminals. See Installation Manual - Physical Planning (GA27-3079) for the 3660 System and the 3660 Supermarket System "System" pages for further information.

The communications adapter permits operation at 2400 bps over communications common carrier facility type C5 for out-of-store communications. For information concerning that facility, see M 2700 pages.

PREREQUISITES:
- A 3669 Store Communications Unit mdl 1 must be attached.
- A 3663 Supermarket Terminal mdl 1 must be attached.
- Any virtual storage S/370 or 4300 Processor ...(3158 or 3168 VTAM only).

For minimum configuration requirements, refer to Host S/370 or 4300 Processor System Programming pages. One of the following must be utilized -- a 3704, 3705 or Communications Adapter on 4331 Processor equipped with appropriate features. For S/370 mdl 115, 125, 135, 135-3 or 138, this may be an ICA equipped with the proper BSC and switched network features. The modem that is used by the 3704, 3705 or Communications Adapter on 4331 Processor must be either a 3872 or equivalent or an IBM 2400 bps Integrated Modem with switched network features.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug = #9884 for 208 V, or #9886 for 230 V. Non-locking plug = #9885 for 208 V, or #9887 for 230 V.

[2] Communications: #9071 for Binary Synchronous Communications, or #9072 for Synchronous Data Link Control Communications.

[3] Controller Designation: Specify #9491 on the first 3651 to be used with a host system location and specify #9492 on each additional 3651 in the network.

When #9491 is specified, additional information must be specified as follows:

1) Specify one of the following to indicate magnetic tape density (media) used at the host system location. This tape media is available under DOS/VS, OS/VS1 and OS/VS2 only.
   #9412 -- 9-track 800 bpi.
   #9413 -- 9-track 1600 bpi.
   #9414 -- 9-track 6250 bpi.

If magnetic tape is not used at the host system specify one of the following media which is available under DOS/VS only.
   #9421 -- 2316 Disk Pack.
   #9422 -- 3336 Disk Pack Mdl I.
   #9423 -- 3336 Disk Pack Mdl II.
   #9424 -- 3348 Data Module.

The 3651 controller data will be sent via the specified media.

If disk media is required, the IBM disk will be returned to the plant location after installation of the controller data.

[4] Cable: A 10' cable to the 3669 is provided as standard. If a longer cable is required, specify #9021, indicating length as a quantity of 20, 30 or 40.


Order Department. One is furnished at no charge to each 3660 site for testing store loop wiring.

[6] Additional DAA Cable: Specify #9101 if second DAA cable is required in configuration (for using switched 3872 modem to reload controller from host while system is being backed up from another store).

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3653 POINT OF SALE TERMINAL

Purpose: An intelligent input/output terminal for the 3650 Programmable or Retail Store System to provide retail point-of-sale data collection, credit authorization, and inquiry functions. Self-contained intelligence allows the 3653 to continue most sales functions when disconnected from the 3650 system after a paramet er initialization from either the Store Controller or magnetic wand reader.

Model 1 Not customer programmable. Attaches to 3651 mdl A25, B25, A50, B50, A75, B75, C75 and D75.

Model 1P Customer programmable. Optionally will function as a model 1 (non-customer programmable). Attaches to 3651 mdl A25, B25, A50, B50, A75, B75, C75 and D75. When attached to model A50 or B50 it can function as a model 1 only.

Basic storage is 36K bytes. This may be increased to 60K bytes through installation of Storage Increment features.

Highlights: A solid state, utilitized packaged unit. It features data entry via the magnetic wand reader feature and a 10 numeric-key, 19 function-key keyboard ... step-by-step display of operator instructions ... printing or display of items in response to an inquiry ... display of numeric data as it is being key entered ... transmittal of data to a 3651 for logging, over a unique transmission line capable of handling large volumes of short messages from many terminals ... a cash drawer with removable till.

Keyboard -- a ten-key numeric pad and nineteen function keys provide entry for variable source data. Types of transactions are indicated through the numeric pad, as well as data fields. Once a field has been entered, the depression of a function key causes one or more of the following functions to happen: editing for minimum and maximum field length, modulo check, price look-up, credit authorization, printing, transmission to the 3651 Store Controller, change in guidance or error feedback.

Printer -- a three station printer which produces a cash receipt or salescheck as well as a journal for each transaction.

Display -- an eight-digit numeric display plus "$", "+", and "/": with five bulletin captions shows numeric data as it is being keyed, extended prices, status codes for credit referrals, subtotals, totals, amount due, change, and refund amounts.

Operator Guidance -- step-by-step instructions are provided to the operator for each transaction by twenty bulletin messages. Additional guidance is provided by the type of transactions shown on the numeric keys.

Status Indicators -- advise the operator that the terminal is: ready for use, waiting for a response to an inquiry or transmission to the 3651, off-line from its 3651, or that the journal roll up roll is full.

PREREQUISITE: The 3650 system controller is a 3651 Store Controller Model 25, 50 or 75 ... see 3651 model 25, 50 or 75 for details.

Customer Responsibilities: [1] See 3650 in "Systems" for general description of customer responsibilities ... [2] The following statement is to be included in proposals:

"It is agreed that IBM will have no responsibility to provide warranty or maintenance service on an IBM 3653 Point of Sale Terminal when cash is contained in the unit. It shall be the purchaser's (customer's) responsibility to remove, control, and replace cash so that IBM can fulfill its warranty and maintenance obligations.

The exception to the above shall be when a failure occurs in the cash drawer and it cannot be opened prior to CE maintenance. In those cases the customer shall assign one of his personnel to assume responsibility for removal of the cash once the drawer has been opened."

Environment: See 3650 Programmable or Retail Store System in "Systems." Maintenance: Installation of 3653s in the immediate sales area may preclude the acceptability of on-line repair due to the public scrutiny and loss of the selling location for customer service. In these cases, the customer should remove the failing terminal to a repair facility located within the store for subsequent repair. At this location the CE will repair and test the terminal on-line via a customer provided store loop termination.

Supplies: A black ribbon cartridge, IBM Part No. 1136970 or equivalent, should be used for machines installed prior to June, 1975. Machines installed after this date and those machines previously installed that are changed to the new ribbon drive mechanism should use IBM Part No. 1136660 or equivalent.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9680 for locking plug, or #9881 for non-lock plug.

[2] Journal Lock: #9322 if lock is desired on access cover to journal take-up roll, journal tape supply, and cash receipt tape supply. For additional or replacement locks and keys, see M 10000 pages.

[3] Till Cover with Lock: #9770 if top cover for cash drawer till is desired. For additional tills and covers and additional or replacement cash drawer locks and keys, see M 10000 pages.

[4] Till with Movable Bill Dividers: #9799 if movable bill dividers are desired. Otherwise, a till with fixed bill dividers will be supplied.

[5] Cash Drawer Lock: The 3653 is equipped with a cash drawer lock. A group of 25 unique lock numbers has been reserved to allow a customer to specify identical lock types on all terminals. This allows all cash drawers to be opened with the same key. If this is desired, specify one of the following types on the 3653 order.

#9101 #9106 #9111 #9116 #9121
#9102 #9107 #9112 #9117 #9122
#9103 #9108 #9113 #9118 #9123
#9104 #9109 #9114 #9119 #9124
#9105 #9110 #9115 #9120 #9125

If none is specified, a lock will be selected at random from a larger group of lock types, each 3653 will be shipped with two cash drawer keys. For additional or replacement locks, refer to M 10000 pages.

[6] Fractional Quantity Key: #9188 if the Fractional Quantity Selectable Function is chosen. Provides a key on the 3653 Keyboard with appropriate nomenclature.

ATP/MPC

PRICES: Mdl Price Purchase MMMC

$ 124 $3,790* $ 17
1P $137 4,090* 20

Warranty: 5 Year Purchase Option: 55% Maintenance: D Used Life Category: 2 Per Call: 1 Termination Charge Months: 6 Termination Charge Percent: 20% Upper Limit Percent: 5%

Model Changes: Model changes from model 1 to model 1P can be made in the field. All replaced parts of the base model become the property of IBM. The Functional Expansion Features (4222, 4223 and 4224) cannot be interchanged between the 3653 mdl 1 and the 3653 mdl 1P and would remain with the customer if a model change is made.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From model 1 to model 1P ..... $ 425

SPECIAL FEATURES

FUNCTIONAL EXPANSION (4222), [Mdl 1 only] Provides the 3653 with the capability to support additional functions.

Limitations: Not available for shipment after 3/25/77. #4222 is mutually exclusive with #4223 and 4224. Maximum: One. Field Installation: Yes. (Feature prices are based on plant installation. This feature requires the submission of an RPO.)

FUNCTIONAL EXPANSION INCREMENT - TYPE I (4223), [Mdl 1 only] Provides the 3653 with the capability to support additional functions. The capability provided by this feature is equal to that provided by Functional Expansion (4222) ... see Note 1 below.

Limitations: The third Type I Increment (#4223) cannot be installed on a 3653 with Functional Expansion Increment - Type II (#4224). #423 is mutually exclusive with #4222. See Note 2 below for allowable configurations. Maximum: Three. Field Installation: Yes.

FUNCTIONAL EXPANSION INCREMENT - TYPE II (4224), [Mdl 1 only] Provides the 3653 with the capability to support additional functions. The capability provided by this feature is twice that provided by Functional Expansion Increment - Type I (#4223) ... see Note 1. Limitations: Cannot be installed on 3653 with third Functional Expansion Increment - Type I (#4223). #4224 is mutually exclusive with #4222. See Note 2 below for allowable configurations. Maximum: One. Field Installation: Yes.

Prerequisites: The 3653 must have two Functional Expansion Increments - Type I (#4223) installed.

STORAGE INCREMENT (4225), [Mdl 1P only] Provides an additional 8,176 bytes of storage. Maximum: Three. Field Installation: Yes.

IML-READ ADAPTER (4632), [Mdl 1P only] Provides a means to initialize...
3653 Point of Sale Terminal (cont'd)

3653 terminals when a 3651 Store Controller mdl A25, B25, A50, B50, A75, B75, C75 or D75 is unavailable or unable to provide the IML (Initial Machine Load). An adapter is provided for attaching an external tape cassette recorder and reading data previously recorded at a 3651 equipped with the IML-Write Adapter (#4633). Maximum: One. Field Installation: Yes.

MAGNETIC WAND READER (#4944). A hand operated wand used to read single track delta distance encoded magnetic merchandise tickets, credit cards, and employee badges. The small light-weight wand attached via a four foot long, flexible cord, allows encoded merchandise tickets to be read without removing them from the merchandise. See Notes 3 and 4. Maximum: One. Field Installation: Yes.

MODIFIABLE KEYBOARD (#4990). Provides an alternate keyboard designed to aid in faster keying and in customizing to a user’s requirements. Provides up to 16 department motor keys. Maximum: One. Field Installation: Not recommended.

Notes:
(1) Order Confirmation of allowable or maximum combination of additional functions to be used with Functional Expansion Increments must be obtained.
(2) The table below defines Plant Installable configurations and the maximum allowable field upgrades of #4223 and #4224.

<table>
<thead>
<tr>
<th>Number of Functional Expansion Increments</th>
<th>Type I (#4223)</th>
<th>Type II (#4224)</th>
</tr>
</thead>
<tbody>
<tr>
<td>If Plant Installed Configuration is:</td>
<td>0 0 1 1 2 2 2 3</td>
<td>0 0 0 0 0 0 1 0</td>
</tr>
<tr>
<td>Is Field Upgrade Possible?</td>
<td>Yes Yes Yes Yes Yes Yes No</td>
<td></td>
</tr>
<tr>
<td>Maximum Upgrade Possible Above</td>
<td>Type I (#4223)</td>
<td>2 3* 1 .2* 1* 0 0 0</td>
</tr>
<tr>
<td>Plant Installed Configuration Allowable is:</td>
<td>Type II (#4224)</td>
<td>1 0 1 0 0 1 0 1*</td>
</tr>
</tbody>
</table>

* Customers who elect to purchase the third #4223 and anticipate later ordering #4224 should consider purchase of #4224 initially because field upgrade requires the replacement of the third #4223.

(3) The minimum encoding specifications that must be met by suppliers of credit cards, merchandise tickets and employee badges will be furnished upon request.
(4) See “Program Loading at Power-On Time” below for other use of wand.

ATP/MLC Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>5 yr Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Mdl 1 Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Functional Expansion #4222</td>
<td>$3</td>
<td>$72**</td>
</tr>
<tr>
<td>Functional Expansion Increment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Type I</td>
<td>4223</td>
<td>3</td>
</tr>
<tr>
<td>- Type II</td>
<td>4224</td>
<td>6</td>
</tr>
<tr>
<td>For Mdl 1P Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Storage Increment</td>
<td>4225</td>
<td>4</td>
</tr>
<tr>
<td>For Mdl 1 and 1P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IML-Read Adapter</td>
<td>4632</td>
<td>11</td>
</tr>
<tr>
<td>Magnetic Wand Reader</td>
<td>4944</td>
<td>11</td>
</tr>
<tr>
<td>Modifiable Keyboard</td>
<td>4990</td>
<td>4</td>
</tr>
</tbody>
</table>

Program Loading at Power On Time

With IBM 3650 Retail Store System Release I

3651 Available: The IML and Parameter Initialization are loaded from the 3651 Store Controller.
3651 Unavailable: The IML must be obtained from a back-up 3651 Store Controller. Parameter Initialization is accomplished by wandng magnetically encoded tickets with the Magnetic Wand Reader (#4494) at each 3653.

With IBM Retail Store System Release II and Release III.

3651 Available: The IML, selectable functions (see Product Announcement 274-20, May 3, 1974) and Parameter Initialization are loaded from the 3651 Store Controller.
3651 Unavailable: The IML, selectable functions and Parameter Initialization requires one 3653 with the IML-Read Adapter (#4632) feature on each local loop and at each remote location.

With IBM 3650 Programmable Store System

3651 Available: The IML is loaded from the 3651 Store Controller.
3651 Unavailable: The IML requires one 3653 with the IML Read Adapter (#4632) feature on each local loop and at each remote location.

** Pilot Test applies: PTP Option Percent: 70%
3657 TICKET UNIT

Purpose: Magnetic Merchandise Ticket Input/Output Unit for the 3650 Programmable or Retail Store System.

Highlights: The 3657 is an on-line, high speed batch ticket encoder that can also perform batch ticket reading. Tickets are one inch high and contain a magnetic stripe 1/4 inch wide that runs the length of the ticket. The 3657 encodes this stripe with machine readable data which is read by the 3657 or by a wand reader available on the 3653 Point of Sale Terminal. Tickets also contain 2 lines of human readable data.

Two general types of tickets are used:

Label — 1” x 1” self-adhering paper stock with a protective backing. The 1” x 1” label dimension applies to label and backing. The label when detached is approximately 0.940” x 0.940”.

Tag — 1” x 2” and 1” x 3” heavy-duty paper stock attached to merchandise by hanging or stapling.

Input — 1”, 2” or 3” roll stock or 2” individual tags.

Batch Reading — Individual 2” tickets can be read from a cartridge. Tickets are fed from a removable cartridge and if successfully read are stacked into an identical cartridge. For additional or replacement cartridges, see M 10000 pages.

Output — 1”, 2” or 3” roll, strip or 2” individual tags.

Rated Speed — Speed is dependent on length of ticket, number of header tickets, output method selected and competing traffic on the Loop.

Header tickets are print-only tickets which may be interspersed in the ticket output stream for batch or purchase order identification. Header tickets are not considered as merchandise identifiers.

Tickets per Minute

<table>
<thead>
<tr>
<th>Ticket Size</th>
<th>Approximate Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1” Roll</td>
<td>500</td>
</tr>
<tr>
<td>2” Roll</td>
<td>250</td>
</tr>
<tr>
<td>3” Roll</td>
<td>167</td>
</tr>
<tr>
<td>2” Individual</td>
<td>130 (both make mode and read mode)</td>
</tr>
</tbody>
</table>

Printing — The two lines of human readable data are printed with two identical eight wire matrix print heads. Characters are 0.117 inch high spaced 12 characters per inch. A 64 character set oriented to the retail industry is provided. Uses a cassette ribbon replaceable by the customer.

Ticket Data Content

<table>
<thead>
<tr>
<th>Ticket Size</th>
<th>Encode</th>
<th>Print</th>
</tr>
</thead>
<tbody>
<tr>
<td>1”</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>2”</td>
<td>40</td>
<td>42</td>
</tr>
<tr>
<td>3”</td>
<td>60</td>
<td>64</td>
</tr>
</tbody>
</table>

Maximum: The maximum number of 3657s that can be attached to a 3651 depends on the number of positions available and the traffic volumes and response times required.

PREREQUISITE: An available Loop position.

Supplies: Merchandise tickets may be purchased from the IBM.

SPECIFY: Voltage (AC, 1-phase, 3-wire, 60 Hz): #9901 for 115 V.

PRICES: Mdl MRC ETP/ MLC Purchase MMMC

<table>
<thead>
<tr>
<th>3657</th>
<th>1</th>
<th>$685</th>
<th>$583</th>
<th>$23,850</th>
<th>$75.50</th>
</tr>
</thead>
</table>

Plan Offering: Plan B

Useful Life Category: 2

Usage: Self-Service

Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

3659 REMOTE COMMUNICATIONS UNIT

Purpose: The IBM 3659 is a 2400 bps signal converter, used to provide store loop capabilities to establishments that are remotely located from the 3651 Store Controller mdl 50. The 3659 is used at each remote location to interface to common carrier provided voiceband private line (non-switched) channels for data transmission and to the store loop for Programmable or Retail Store System operations.

Model 1: Point-to-point remote communications unit.

Model 2: Multipoint remote communications unit.

Model Changes: At time of manufacture only.

Highlights: If a single remote site is served, the 3659 mdl 1 operation is duplex over a four-wire duplex line connecting the store to the 3651. If two or three remote sites are served, the 3659 mdl 1 operation is duplex over two-wire half-duplex lines connecting the stores to the 3651 in a serial manner. The use of the 3659 mdl 2 can provide service to up to twelve remote sites using a 4-wire duplex multipoint configuration.

Data Rate — 2400 bps.

Equalization — manually adjusted by an operator.

Problem Determination Aids: Included in each 3659 Remote Communications Unit are the following problem determination aids accessible to the operator:

- The unit may be wrap tested independently of the attached telecommunication line and store Loop.
- The unit may be line tested (with telecommunication lines) and the modem at the 3651 or the adjacent 3659(s) independent of the store Loop.

Communications Facilities

Common Carrier Non-switched Facilities — Voiceband private line (non-switched) channel type 3002 (or equivalent).

Privately Owned Communications Facilities — Equivalent to above.

Attachment to Communications Line — Via one cable provided by the 3659 and a second cable to interface to the store loop.

Related Equipment — The 3659 mdl 1 communicates with 3659 mdl 1s at other remote sites and/or an IBM 3872 Modem with #6101 or #6102 which is connected to the first or second Remote Loop Adapter special feature on the 3651 Store Controller Model 50. The IBM 3872 in this application may require an RPQ. See M 3872 page, this section.

The 3659 mdl 2 communicates with an IBM 3872 Modem without any special features or with #6302 only in a multipoint configuration. The 3872 is the control station modem in the multipoint network.

Customer Responsibilities: [1] The customer must provide (purchase, install, and maintain) all the necessary 3650 communications lines within the store. (Bulk Loop Cable is available from IBM. See M 10000 pages.) ... [2] See the M 2700 pages. The customer is responsible for the following ... obtaining assurance from the local common carrier that the telephone service provided will comply with the facilities described in the Bell System Technical Reference, "Data Communications Using Voiceband Private Line Channels", PUB 41004, Oct 973, for a 3002 channel. Inform the common carrier that the speed of the operation will be 2400 bps.

PREREQUISITE: See "Teleprocessing Systems" in the GI section of the sales manual.

SPECIFY: Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug — #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug — #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

PRICES: Mdl MRC ETP/ MLC Purchase MMMC

<table>
<thead>
<tr>
<th>3659</th>
<th>1</th>
<th>$112</th>
<th>$95</th>
<th>$4,250</th>
<th>$19.50</th>
</tr>
</thead>
</table>

Plan Offering: Plan B

Useful Life Category: 2

Usage: Self-Service

Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

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3661 STORE CONTROLLER

Purpose: The control unit for a 3660 Supermarket Key-Entry System controls all functions of the 3663 Supermarket Terminals and provides for communications with the appropriate Host System. See "Communications Facilities" and "Prerequisites."

Model 1 A controller that houses a direct access diskette drive with a one-sided removable diskette.

Model 2 A controller with a diskette drive which accommodates a one or a two-sided removable diskette.

Highlights: Up to twelve (optionally eighteen) 3663 Supermarket Terminal Stations may be included in a 3660 Supermarket Key Entry System. One 3663 model 2 must be attached to the 3661 via local attachment (standard), and a second, or third 3663 model 2 may be attached locally to the 3661 via the optional 3663 Model 2 Local Attach Feature. All other 3663 Terminal Stations in the system, up to 11, or optionally up to 17, depending upon the number of locally attached stations, are attached via a store loop.

The 3661 with the 3663 Supermarket Terminals provides the following functions:

Customer Checkout
- Automatic pricing through code look-up in a master price file for up to 250 items standard and up to 1275 items with Additional Storage Feature (11252).
- Automatic handling of multiple priced items in master file.
- Automatic handling of mix and match group pricing for items in the master price file.
- Automatic distribution of net sales by department.
- Automatic application of transaction discounts.
- Automatic computation of sales taxes with automatic handling of taxable and non-taxable items.
- Automatic control of maximum value of food stamps that should be accepted.
- Check verification facilities (negative with reason code) through look-up against a check verification record.
- Calculation of change and trading stamps due.

All functions can be controlled to inhibit initiation by unauthorized personnel.

Store Support
- Preparation of the following accounting reports;
  - Store Summary
  - Individual cashier performance and tender reconciliation
  - Store office tender reconciliation
  - Sales by department (up to 9)
  - Distribution of miscellaneous income and disbursements by account.
- Current inquiries for department sales, cashier performance and cash position, and store cash position.
- Maintenance of master price file, check verification file, and operator authorization file.
- Productivity totals for each terminal station and store totals in 60 minute increments.
- Setting time and date for the internal clock.
- Customer checkout training mode.
- Printing miscellaneous messages received previously from the host.
- Entry of miscellaneous messages for subsequent retrieval by the host.
- Reporting of items returned by customers which are returned to stock.
- Updating the system with data received from the host.
- Shelf Label Preparation

Most store support functions may be performed concurrent with customer checkout. All functions are individually controlled to inhibit initiation by unauthorized personnel.

Data Accumulation

The 3661 accumulates the following by-product data for subsequent retrieval by the host. Item movement totals, all accounting and performance totals used in store reports, totals of taxes and taxable sales, productivity totals for each terminal station in sixty minute increments, exception events, and security sensitive events.

Host S/370 or 4300 Processor Transmission

The 3661 can transmit to the host, upon receiving a request, all of the data shown under "Data Accumulation" and other data or records in the 3661. The 3661 will clear out data or records upon receipt of the host. The 3661 can receive changes, commands or other pertinent data from the host. See "Programming Support" section of the sales manual for description of host, programming support, and requirements. Host communications cannot be performed concurrent with customer checkout or store support procedures.

Communications Facilities: For in-store operation, a store loop provides the communications link to the 3663 supermarket terminals. See Installation Manual - Physical Planning, GA27-3079, for further information.

The communications adapter permits operation at the speed indicated over the facility shown below when using the appropriate modem. For information concerning the facility, see M 2700 pages.

1200 bps ... on facility C4.

PREREQUISITES:

- One 3663 Supermarket Terminal Mdl 2 must be locally attached.
- A properly equipped S/370 or 4300 Processor must be available. The S/370 or 4300 Processor must contain a virtual storage processor. For minimum configuration requirements refer to S/370 or 4300 System Programming pages. In addition, either a 3704 or 3705 or an ICA must be used on a S/370 model 115, 125, 135, 135-3 or 138, or a Communications Adapter (#1601) feature on the 4331. 1200 bps external modems may be used with 3704, 3705, and ICA on S/370 model 115, 125, 135-3 or 138, or a Communications Adapter (#1601) feature on the 4331. 1200 bps internal modems may be used with 3704, 3705, and ICA on S/370 model 115 or 125, or a Communications Adapter (#1601) feature on the 4331. For required features, see M 2700 pages.

- IBM has not tested the 3660 Supermarket Key-Entry System on non-virtual IBM systems. If a customer elects to establish communications with other than a virtual host system, the customer must understand that IBM does not assume responsibility for the resolution of any programming problems resulting from this system configuration.

- Communications Features - one of the following arrangements must be used ...
  1. Communications Feature with Clocking (#1482), 1200 bps Integrated Modem - Switched S/370 Processor, or #5501, and a Data Coupler.

  SPECIFY: [1] Voltage (115 VAC, 1-phase, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

  [2] Communications: #9075 for Binary Synchronous Communications, or #9076 for Synchronous Data Link Control.

  [3] System Attachment: Identify the host processor(s) for the 3660 Supermarket Key-Entry System by specifying the following codes:

<table>
<thead>
<tr>
<th>Processor</th>
<th>Code</th>
<th>Processor</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>3115</td>
<td>#9589</td>
<td>3148</td>
<td>#9591</td>
</tr>
<tr>
<td>3125</td>
<td>#9586</td>
<td>3155</td>
<td>#9583</td>
</tr>
<tr>
<td>3135,3135-3</td>
<td>9581</td>
<td>3158</td>
<td>#9587</td>
</tr>
<tr>
<td>3135</td>
<td>9590</td>
<td>3165</td>
<td>#9584</td>
</tr>
<tr>
<td>3145,3145-3</td>
<td>9582</td>
<td>3168</td>
<td>#9588</td>
</tr>
<tr>
<td>3033</td>
<td></td>
<td>3092</td>
<td></td>
</tr>
<tr>
<td>4331</td>
<td></td>
<td>9606</td>
<td></td>
</tr>
<tr>
<td>3431</td>
<td></td>
<td>9607</td>
<td></td>
</tr>
</tbody>
</table>

  [4] Modem Cable (external modem): A 10' cable to the modem is standard. If a longer cable is required, specify #9442 as a quantity of 20', 30', 40' or 50'.


  One is furnished at no charge to each 3660 site for testing store loop wiring.
MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model 1 to Model 2 ..... $2,000

* Customer price quotations and customer order acknowledgement letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM."

SPECIAL FEATURES

ADDITIONAL STORAGE FEATURE (#1222). Provides an additional 8,192 bytes of storage. The user can utilize this either to increase the system's capacity for terminal stations from 12 to 18, or to increase the system's capacity for items from 250 to 1,275. Maximum: Two. Limitation: If two of these features are installed, the user cannot utilize both of them for the same purpose. Field Installation: Yes.

COMMUNICATIONS FEATURE WITH CLOCKING (#1482). Required for attachment to communications facilities through the 1200 bps Integrated Modem (#5501) or any external modem which does not have internal clocking. Maximum: One. Field Installation: Yes.

EIA INTERFACE (#3701). Provides the interface logic necessary to attach an external modem for communications to the host processor. Non-IBM modems may be attached subject to the Multiple Suppliers policy. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with 1200 bps Integrated Modem-Switched (#5501). Prerequisite: (1) External Modem Cable (#9442), for cable length specify quantity of 10, 20, 30, 40 or 50 feet ... (2) Communications Feature with Clocking (#1482).

1200 BPS INTEGRATED MODEM - SWITCHED (#5501). Provides the point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with EIA Interface (#3701). Prerequisite: Communications Feature with Clocking (#1482). User must provide a Data Coupler type CBS or equivalent.

SCALE ADAPTER (#6672). Allows attachment of an electronic scale (Toledo 8210 with display or equivalent) for use with a locally attached 3663 mdl 2. Specify #9576 if scale will be used with first 3663 mdl 2, or #9577 if it will be used with second 3663 mdl 2, or #9578 if it will be used with the third 3663 mdl 2. Maximum: Three. Note: See customer responsibilities under 3660 in "Systems" pages. Field Installation: Yes.

3663 Mdl 2 LOCAL ATTACH FEATURE (#8110). Provides for the local attachment of a second 3663 mdl 2. Maximum: One. Field Installation: Yes. Note: The first 3663 mdl 2 attachment is provided in the basic 3661.


Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>ETP/2yr</th>
<th>MAC/2yr</th>
<th>MLC/2yr</th>
<th>Purchase MMCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add'l Storage Feature #1222</td>
<td>$32</td>
<td>$27</td>
<td>$637</td>
<td>$5.00</td>
</tr>
<tr>
<td>Comm Fea w Clocking 1482</td>
<td>19</td>
<td>16</td>
<td>710</td>
<td>3.00</td>
</tr>
<tr>
<td>EIA Interface 3701</td>
<td>12</td>
<td>10</td>
<td>424</td>
<td>4.00</td>
</tr>
<tr>
<td>1200 bps Intgrtd Modem 5501</td>
<td>25</td>
<td>21</td>
<td>840</td>
<td>6.50</td>
</tr>
<tr>
<td>Scale Adapter 6672</td>
<td>6</td>
<td>5</td>
<td>143</td>
<td>.50</td>
</tr>
<tr>
<td>3663 Mdl 2 Local Attach 8110</td>
<td>11</td>
<td>9</td>
<td>292</td>
<td>3.00</td>
</tr>
<tr>
<td>Local Attachment Feature for 3rd 3663 mdl 2</td>
<td>8111</td>
<td>14</td>
<td>12</td>
<td>365</td>
</tr>
</tbody>
</table>

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**3663 SUPERMARKET TERMINAL**

**Purpose:** In conjunction with the IBM 3651 mdl A25, B25, A60, B60, A75, B75, C75, D75 Store Controller, or the IBM 3661 Store Controller, the 3663 Supermarket Terminal provides the input and output facilities necessary to process transactions in a supermarket environment. It replaces and extends the function of mechanically similar registers.

**Model 1**

- **Station and Control** — one printer, display, keyboard, cash drawer, and customer programmable control segment for operating one checklist. **LIMITATION:** Not available in conjunction with the 3651 Store Controller mdl A25 B25, A60 B60, A75 B75, C75 or D75.

**Model 1P**

- **Station and Control** — one printer, display, keyboard, cash drawer, and customer programmable control segment for operating one checklist. **LIMITATION:** Not available in conjunction with the 3651 Store Controller mdl A60 or B60 — Supermarket, or with the 3661 Store Controller.

**Model 2**

- **Station Only** — one printer, display, keyboard, and cash drawer that is attached to a 3663 mdl 1, 1P, or 3P, or to the 3661 Store Controller, for operating additional checkstands. One 3663 mdl 2 must be attached to the 3661, a second and a third 3663 mdl 2 may be attached via #8110 and #8111 respectively. (#8110 is a prerequisite for #8111.)

**Model 3**

- **Control Segment Only** — a control segment for controlling one, or optionally up to three, 3663 mdl 2s. **LIMITATION:** Not available in conjunction with the 3651 Store Controller mdl A25, B25, A60, B60, A75, B75, C75 or D75. **NOTE:** The first 3663 mdl 2 attachment is provided in the basic 3663 mdl 3. Prerequisite: One 3663 mdl 2 must be attached to the 3663 mdl 3.

**Model 3P**

- **Control Segment Only** — a customer programmable control segment for controlling up to three, 3663 mdl 2s. **LIMITATIONS:** Not available in conjunction with the 3651 Store Controller mdl A60 or B60 — Supermarket, or with the 3661 Store Controller. **NOTE:** The first 3663 mdl 2 attachment is provided in the basic 3663 mdl 3P. **PREREQUISITE:** One 3663 mdl 2 must be attached to the 3663 mdl 3P.

**Highlights:**

- A storage area for each station into which keyed (or scanned if the 3666 or 3667 Checkout Scanner is attached) data is entered prior to being transmitted to the IBM 3651 Store Controller mdl A25, B25, A60, B60, A75, B75, C75 or D75 or the IBM 3661 Store Controller. Checks for code accuracy, sequence control, field length, and correct number of fields. Another storage area for each station is used for receiving a previously entered message after being processed at the 3651 mdl A25, B25, A60, B60, A75, B75, C75 or D75. Upon receiving messages, data is edited and transferred to the printer and display.

**Keyboard:** Have a ten-key numeric pad plus function keys. In part these include department keys, special item modification keys (for price, quantity and weight entries), tender payment keys, coupon entry keys, and other related supermarket required keys. See the IBM 3650 Supermarket System Introduction Manual GA27-3076 or the IBM 3650 Programmable Store System Introduction Manual, GA27-3163 for details.

**Printer:** Has two tape print locations as standard. Using a horizontal radial print technique is the customer receipt. The second tape is for summary journal data. An optional Document Insert feature position may be added. Alphanumeric printing is accomplished with a dot matrix printing on the lines in each position is up to 30 characters. Customer receipt tape print- ing is at 80 lines per minute. Summary journal tape printing is at 50 lines per minute. Document Insert printing is at 35 lines per minute. Shelf labels can be printed at 3-4 labels per minute, depending upon the size of the label.

**Cash Drawer:** A removable and lockable till with five spring-weighted bill compartments and five coin compartments. A 3-position lock control is attached to the drawer with a power switch on the drawer regardless of power status. The key is removable in any position. No terminal function can be initiated with the drawer open.

**Display:** A variable character display panel allows displaying an alphanumeric message of up to 22 characters in length. Characters are .4 inches high and variable in width.

**Communications:** Provided over two 2-wire customer provided location-called store loops. Message from the 3663 is sent to the 3651 or 3661, and from the 3651 or 3661 to the 3663 as necessary. The 3663 is monitored by the 3663 Supermarket Terminal for terminal destination. A pluggable address scheme is provided for terminal numbering.

**Package:** The standard station can be specified fully integrated (all segments under a single cover) or integrated with a remote display. An optional special feature with a specidy code can provide two remote stations (O/G segments separately covered to allow location flexibility).

**PREREQUISITES:**

**With 3651 Store Controller mdl A25, B25, A60, B60, A75, B75, C75 or D75:** (1) An available store loop position ... (2) For attachment of a 3663 mdl 2 to a store loop, a 3663 mdl 1P with a Model 2 Attachment Feature is a prerequisite, unless the 3663 mdl 2 is attached to a 3663 mdl 3P. For attachment of a 3663 mdl 2 to a 3663 mdl 3P, a Model 2 Attachment Feature (#4900) is a prerequisite if it is the second 3663 mdl 2 attached to the 3663 mdl 3P. The first 3663 mdl 2 attachment is provided in the basic 3663 mdl 3P.

**With 3651 Store Controller mdl A60 or B60:** (1) A 3669 Store Communications Unit and an available store loop position ... (2) A 3663 mdl 1 with a Model 2 Attachment Feature is a prerequisite for each 3663 mdl 2 to be added to a store loop.

**With 3661 Store Controller:** (1) An available local attachment on the 3661 or a store loop position. (NOTE One 3663 mdl 2 must be attached to the 3651 via the standard local attachment with two 3663 mdl 1s ... one or two additional 3663 mdl 2s can be locally attached via optional Local Attachment Features) ... (2) For attachment of a 3663 mdl 2 to the store loop a 3663 mdl 1 with a Model 2 Attachment Feature is a prerequisite, unless the 3663 mdl 2 is attached to a 3663 mdl 3. For attachment of a 3663 mdl 2 to a 3663 mdl 3, a Model 2 Attachment Feature (#4900) is a prerequisite if it is the second 3663 mdl 2 attached to the 3663 mdl 3. ... a 3rd Model 2 Attachment Feature (#4901) is a prerequisite if it is the third 3663 mdl 2 attached to the 3663 mdl 3. **NOTE:** The first 3663 mdl 2 attachment is provided in the basic 3663 mdl 3.

**Customer Responsibilities:** See 3650 and 3660 in "Systems" section of sales manual. The following statement is to be included in proposals:

> "It is agreed that IBM is relieved of responsibility for loss of funds contained in, dispensed by or associated with any machine under an IBM Agreement after its delivery to the customer. It is also agreed that IBM will have no responsibility to provide warranty or maintenance service on any such machine when such machine contains funds. It shall be the customer's responsibility to remove, control, and replace or reload funds so that IBM can fulfill its warranty and maintenance obligations. The exception to the above shall be when a failure occurs in the cash drawer of any machine under the Agreement, and it cannot be opened prior to maintenance by IBM. In those cases, the customer shall assign one of its personnel to assume responsibility for the removal of the funds once the drawer has been opened."

**Maintenance Agreement:** IBM must install and maintain the 3663 must be reviewed

**Supplies:** A black ribbon, IBM Part No. 1136970 or equivalent, should be used for machines installed prior to June, 1975. Machines installed after this date and those machines previously installed that are changed to the new ribbon drive mechanism should use IBM Part No. 1136660 or equivalent.


**SPECIFY:**

1. Voltage: 115 VAC, 1-phase, 60 Hz: #9580 for locking plug, or #9881 for non-lock plug.

2. Packaging: #9547 for fully integrated; #9549 for integrated but with remote display. Specify #9548 for distributed; special feature Distributed Station (#3425) is a prerequisite. Specify one or two additional 3663 mdl 1 or mdl 1P and one for each 3663 mdl 2; if #9548, feature code #3425 for each 3663 mdl 1, mdl 1P and mdl 2 also. Specify codes need not be the same for all 3663s in a store.

TARE Key: #9737 for providing a keypad that has the word "TARE" on it to replace the lower blank key on the 3663. Do not specify if Optional Keyboard (specify code #9488) is ordered. Delete this specification on existing orders pending if optional Keyboard (specify code #9488) is to be added. NOTE: The use of tare capability is mandatory in the State of California.

[5] Keypad Arrangement: Specify #9353 for a reversed keypad (top row -- 7, 8, 9; middle row -- 4, 5, 6; bottom row -- 1, 2, 3). Limitation: In the 3660 Supermarket Scanning and Key Entry Systems, if installed on one 3663 mdl 1 or 2, it must be installed on all 3663 mdl 1s and 2s in the store. Do not specify if Optional Keyboard (specify code #9488) is ordered. Delete this specification on existing orders pending if Optional Keyboard (specify code #9488) is to be added. Field Installation: Not recommended.

[6] Cash Drawer Locks: A separate group of 25 lock numbers has been set aside to allow a customer to use the same key in multiple terminals. If this is desired, specify one of the following locks on the 3663 order.

- #9101
- #9102
- #9103
- #9104
- #9105
- #9106
- #9111
- #9116
- #9121
- #9171
- #9181
- #9194
- #9241
- #9271
- #9295
- #9296
- #9297
- #9298

If this option is not specified, a lock will be randomly selected from another, larger, group of unique lock numbers.

[7] Till Option: Specify #9799 for shipment of a till with adjustable bill dividers. If this option is not selected, an assembled till with fixed dividers will be shipped.

[8] Keyboard Type: One keyboard type must be specified for each 3663 mdl 1, 1P and 2. Specify code #9020 will provide the Regular Keyboard with the ten-key pad positioned on the left. This keyboard may have up to nine department keys. LIMITATION: In the 3660 Supermarket Scanning and Key Entry System, if installed on more than one 3663 in the local or backup store, all key assignments must be the same. Not compatible with Optional Keyboard (specify code #9488). In the 3650 Programmable Store System, all 3663 mdl 2 terminals attached to the same 3663 mdl 3P must have the same type of keyboard and the same key assignments -- paired mdl 1P and 2P terminals must have the same type of keyboard and the same key assignments. Field Installation: Not recommended.

Specify code #9488 will provide the Optional Keyboard with the ten-key pad positioned in the center. The left to right dimension is 16-1/2" in the distributed version; special feature code #3425, (no change in the size of the integrated version). An expanded keypad shipping group is included to provide variety in colors, heights and sizes of blank keytops. Also, a means is provided to allow placing single or double sized keys in many locations. LIMITATIONS: In the 3660 Supermarket Scanning and Key Entry Systems, the keyboard must be installed on all 3663s in a store and is not compatible with the Regular Keyboard (#9020). All key assignments must be the same. In the 3650 Programmable Store System, all 3663 mdl 2 terminals attached to the same 3663 mdl 3P must have the same type keyboard and the same key assignments -- paired mdl 1P and 2P terminals must have the same type of keyboard and the same key assignments. Field Installation: Not recommended. Customer Responsibilities: See 3650 Programmable Store System and 3660 Supermarket System "systems" pages. Prerequisites: In the 3660 Scanning System, special feature #3880 is required on all 3663 mdl 1s in the store if any of the following features are installed in the same store:

- Coin Dispenser Adapters -- #1811, 1812, 1821, 1822
- Stamp Dispenser Adapters -- #7311, 7312, 7321, 7322

### PRICES:

**M** 3663.2 Jul 79

- **3663**
  - **Mdl** 1
    - **S** $191
    - **1P** 204
    - **2** 204
    - **8** 204
    - **9** 204
    - **P** 204
  - **Mdl** 2
    - **S** $191
    - **1P** 204
    - **2** 204
    - **8** 204
    - **9** 204
    - **P** 204

**Prices:** 5 yr, Purchase*, MMCC

**Plan Offering:**

- **Plan B**: Warranty, B
- **Plan G**: Machine Group, G

**Purchase Options:**

- **Option A**: Standard Life Category: 2
- **Option B**: Per Call: 1

**Terminals Charge Months:** 6 Termination Charge Percent: 20%

**Upper Limit Percent:** 5%

**Model Changes:**

- Not recommended for field installation except from model 1 to 1P and from model 3 to 3P. All replaced parts become the property of IBM.

**MODEL UPGRADE PURCHASE PRICE**: (there are no additional installation charges)

- From Model 1 to Model 1P: $700**
- From Model 3 to Model 3P: $700**

**NOTICE:** Customer price quotations and order acknowledgment letters for "Installation of this Change involves the removal of parts which become the property of IBM."

### SPECIAL FEATURES

The following features are for the model 1, 1P and 2 unless otherwise noted.

**DISTRIBUTED STATION** (#3425). Provides distributed packaging of I/O segments to be ordered as local or field installed. Field Installation: Not recommended. Prerequisites: Specify code #9548 on 3663 mdl 1, mdl 1P or mdl 2. Maximum: one per 3663 mdl 1, 1P or 2

**DOCUMENT INSERT** (#3451). Provides a third location on the printer for printing on an inserted form (Refer to 3660 Supermarket Systems Introduction SRL for details on forms). Maximum: One on each 3663 mdl 1, 1P or 2. Limitation: In the 3660 Supermarket Scanning and Key Entry Systems, if this feature is desired for a model 1 on the store loop, it must be installed on the attached model 2 (if any), and vice versa. In the 3660 Supermarket Scanning and Key Entry Systems, if this feature is desired for a model 2 attached to a model 3, it must also be installed on all other models 2s attached to that model 3. Field Installation: Not recommended.


**NUMERIC KEY PAD LOCK** (#5330). Provides a lock to prevent any depression of the numeric keys or delimiter key when an error condition has been detected. Maximum: One. Field Installation: Not recommended.

**RECEIPT STATION HALF SPACE** (#6226). Vertical spacing in the receipt station is modified to provide half normal vertical spacing, i.e., 10 vertical spaces per inch. The spacing may be manually switched to normal (5 lines per inch). This feature also detects end of label and start of label as "End of Forms." Depending upon label size, approximately 3-4 labels per minute can be printed. Limitations: Only one printer per Control Segment can be used when printing shelf labels. 3663s attached locally to the 3661 cannot install this feature. Maximum: One per 3663. Field Installation: Yes.

The following features are for the models 1, 1P, 3 and 3P unless otherwise noted.


**CHECKOUT SCANNER ADAPTER** (#1761). [Mdl 1 only] Allows attachment of an IBM 3666 or 3667 Checkout Scanner for operation with the 3663 mdl 1 to which it is attached. Maximum: One. Field Installation: Yes. Limitations: Cannot be installed when 3663 is attached to the 3661 Store Controller. Cannot be installed on a 3663 if #1763 is installed. Cannot be installed on mdl 1P. However, if this feature was previously installed on a model which converts to a mdl 1P, it may remain after the conversion. NOTE: This feature is to be used only in 3660 systems and for 3660s at EC level prior to 6/66. For 3660 systems at EC levels 6/66 and later and for Programmable Store Systems use feature code #1763.

**2ND CHECKOUT SCANNER ADAPTER** (#1762). [Mdl 1 or 1P only] Allows attachment of an IBM 3666 or 3667 Checkout Scanner for operation with the 3663 mdl 1 or 1P to which it is attached. Maximum: One. Field Installation: Yes. Limitations: Cannot be installed when 3663 is attached to the 3661 Store Controller. Cannot be installed when #1761 is attached. Can only be attached to the 3663 mdl 1 or 1P.

**CHECKOUT SCANNER ADAPTER TYPE 2** (#1763). [Mdl 1 or 1P only] Allows attachment of an IBM 3666 or 3667 Checkout Scanner for operation with the 3663 mdl 1 or 1P to which it is attached. Maximum: One. Field Installation: Yes. Limitations: Cannot be installed when 3663 is attached to the 3661 Store Controller. Cannot be installed when #1761 is attached. Can only be attached to the 3663 mdl 1 or 1P.

**COIN DISPENSER ADAPTER TYPE 1** (#1811). Allows attachment of a 12 column Coin Dispenser (Anker R11150A or equivalent). Specify: #9061 if Coin Dispenser will be used for the station position of a 3663 mdl 1 or 1P or for the first 3663 mdl 2 attached to a 3663 mdl 3 or 3P, or #9062 if it will be used for a 3663 mdl 2.

* Pilot Test applies: PTP Option Percent, 70%.
3663 Supermarket Terminal (cont’d)

2 attached to a 3663 mdl 1 or 1P or for the second 3663 mdl 2 attached to a 3663 mdl 3 or 3P. For the third 3663 mdl 2 attached to the second 3663 mdl 3 or 3P, specify #9062 in conjunction with a second Coin Dispenser Adapter Type 1 (#1811) and a Third Model 2 Attachment (#4901) as prerequisites. Maximum: One on mdl 1 or 1P, or on mdl 3 or 3P. Limitation: Not available if a second Coin Dispenser Adapter Type 2 (#1821) is installed. Field Installation: Yes.

2ND COIN DISPENSER ADAPTER TYPE 1 (#1812). Allows attachment of a second 12 column Coin Dispenser (Anker RG11SOA or equivalent). Maximum: One. Field Installation: Yes. Prerequisites: #1811.

COIN DISPENSER ADAPTER TYPE 2 (#1821). Allows attachment of an 8 column Coin Dispenser (NCR 410 or equivalent). Specify: #1821 if Coin Dispenser Adapter Type 1 for the station portion of a 3663 mdl 1 or 1P or for the first 3663 mdl 2 attached to a 3663 mdl 3 or 3P, or #9064 if it will be used for a 3663 mdl 2 attached to a 3663 mdl 1 or 1P or for the second 3663 mdl 2 attached to a 3663 mdl 3 or 3P. For the third 3663 mdl 2 attached to a 3663 mdl 3 or 3P, specify #9064 in conjunction with a second Coin Dispenser Adapter Type 2 (#1821) as prerequisites. Maximum: One on mdl 1 or 1P ... two on mdl 3 or 3P. Limitation: Not available if Coin Dispenser Adapter Type 1 (#1811) is installed. Field Installation: Yes.

2ND COIN DISPENSER ADAPTER TYPE 2 (#1822). Allows attachment of a second 8 column Coin Dispenser (NCR 410 or equivalent). Maximum: One. Field Installation: Yes. Prerequisites: #1821.

STORAGE INCREMENT (#3880). Provides 2,048 additional positions of storage. All replaced parts become the property of IBM. Limitation: If this feature is required on one 3663 mdl 1 or mdl 3, it must be installed on all mdl 1s and 3s in the store. Maximum: One on 3663 mdl 1 and mdl 3; nine on mdl 1P and 3P. Field Installation: Yes. Prerequisites: Installation of more than 3 Storage Increments (mdl 1P and 3P only) requires one Storage Expansion Feature (#1380).

IML-READ ADAPTER (#4634). (Mdl 1P and 3P only) Provides a means to initialize 3663 terminals when a 3651 Store Controller mdl A25, B25, A75, B75, C75 or D75 is unavailable or unable to provide the IML (Initial Machine Load). An adapter is provided for attaching an external tape cassette recorder (refer to IBM 3650 Retail Store System Introduction Manual, GA27-3075) and reading data previously recorded at a 3651 equipped with the IML-Write Adapter (#4633). Maximum: One. Field Installation: Yes.

MODEL 2 ATTACHMENT (#4900). Allows attachment of one 3663 mdl 2 to a 3663 mdl 1 or 1P, or allows attachment of the second 3663 mdl 2 to a 3663 mdl 3 or 3P. Maximum: On mdl 1 or 1P, one ... on mdl 3 or 3P, one. Field Installation: Yes. Note: The basic 3663 mdl 3 or 3P provides for attachment of the first 3663 mdl 2 as a standard feature.

SCALE ADAPTER (#6671). Allows attachment of an electronic scale (Toledo 8210 with display or equivalent). Specify: #9561 if Scale will be used for the station portion of a 3663 mdl 1 or 1P or for the first 3663 mdl 2 attached to a 3663 mdl 3 or 3P, or #9562 if it will be used for a 3663 mdl 2 attached to a 3663 mdl 1 or 1P or for the second 3663 mdl 2 attached to a 3663 mdl 3 or 3P, or #9563 if it will be used for the third 3663 mdl 2 attached to a 3663 mdl 3 or 3P. Maximum: Two on mdl 1 or 1P ... three on mdl 3 or 3P. Note: See Customer Responsibilities under 3650 and 3660 in “Systems: pages. Field Installation: Yes. Prerequisites: For the mdl 1P and 3P and the 3650 Programmable Store System Point of Sale Application/Supermarket Environment Program Product (5748-D21) is a mandatory requirement in all states conforming to the National Bureau of Standards Handbook #44 for Weights and Measures.

STAMP DISPENSER ADAPTER TYPE 1 (#7311). (Mdl 1 only) Allows attachment of a Stamp Dispenser (Anker AVC 715 or equivalent). Specify: #9571 Stamp Dispenser will be used with model 1, or #9572 if it will be used with an attached model 2. Maximum: One. Limitation: Not available if Stamp Dispenser Adapter Type 2 (#7321) is installed. Not available on 3663 mdl 3. Field Installation: Yes.

2ND STAMP DISPENSER ADAPTER TYPE 1 (#7312). (Mdl 1 only) Allows attachment of a second Stamp Dispenser (Anker AVC 715 or equivalent). Maximum: One. Field Installation: Yes. Prerequisites: #7311, #4900 and the 3663 mdl 2.

STAMP DISPENSER ADAPTER TYPE 2 (#7321). (Mdl 1 only) Allows attachment of a Stamp Dispenser (NCR 414 or equivalent). Specify: #9573 if Stamp Dispenser will be used with model 1, or #9574 if it will be used with an attached model 2. Maximum: One. Limitation: Not available if Stamp Dispenser Adapter Type 1 (#7311) is installed. Not available on 3663 mdl 3. Field Installation: Yes.

2ND STAMP DISPENSER ADAPTER TYPE 2 (#7322). (Mdl 1 only) Allows attachment of a second Stamp Dispenser (NCR 414 or equivalent). Maximum: One. Limitation: Not available on 3663 mdl 3. Field Installation: Yes. Prerequisites: #7321, #4900 and the 3663 mdl 2.

STANDALONE INITIAL MACHINE LOAD (#7555). (Mdl 1 and 3 only) Allows a user-provided tape cassette to be attached to a 3663 Supermarket Terminal mdl 1 or 3 to provide IML capability if required when the 3663 is operating in standalone mode. Maximum: One. Limitation: The IML feature on a 3663 mdl 1 cannot be used to IML a 3663 mdl 3; therefore when there is a mixture of mdl 1s and mdl 3s, the feature should be installed on a mdl 3 instead of a mdl 1. Field Installation: Yes. Prerequisites: A 3661 Store Controller. Note: One IML feature will support all terminals on the store loop. User-provided tape cassette must meet requirements defined in the IBM 3660 Supermarket Systems, Key Entry System Introduction, GA27-3111.

The following feature is for the 3663 mdls 3 and 3P only

3RD MODEL 2 ATTACHMENT (#4901). Allows attachment of the third 3663 mdl 2 to a 3663 mdl 3 or 3P. Maximum: One. Field Installation: Yes. Prerequisites: #4900 on 3663 mdl 3 or 3P.

ATP/M

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* Pilot Test applies: PTP Option Percent: 70%.
† Customer price quotations and customer order acknowledgement letters for options must state: "Installation of this feature involves removal of parts which become the property of IBM."
IB 3666 CHECKOUT SCANNER

Purpose: Fixed head optical reader for the 3650 Programmable Store System and 3660 Supermarket System.

Highlights: Reads the regular (Version "A") and the zero suppression (Version "E") industry standard Universal Product Code (UPC) symbols on manually fed supermarket items placed symbol down on the scanner window ... when used with the 3650 Programmable Store System, can also read industry standard European Article Numbering (EAN-13) symbols (when used with the 3650 Programmable Store System, interpretation of all symbols is done by the user application program) ... item velocity meets the industry's Symbol Standardization Subcommittee requirement for up to 100 inches per second ... packaged as the front end of a total checkstand design ... one 3666 can operate with one 3663 mdl 1, mdl 1P or mdl 2 Supermarket Terminal. The 3666 is 38 inches (96.5 cm) high. The 3666 contains a laser system which complies with the safety standards of the United States Department of Health, Education, and Welfare (Performance Standard for Laser Products, August 2, 1976 - Class 1, 21 CFR Subchapter J).

PREREQUISITES: If the 3666 is to operate with a 3663 mdl 1 or mdl 1P, the 3663 mdl 1 or mdl 1P requires Checksum Scanner Adapter (#1761) or Checkout Scanner Adapter Type 2 (#1763).

Customer Responsibility: Refer to Installation Manual - Physical Planning, GA27-3079, for the 3660 Supermarket System for correct ambient light intensity requirement. A number of states presently have, and others are considering the adoption of, regulations governing the use of laser products. Users should determine the extent of regulation in their state. New York state currently requires an attachment to the checkstand. This user-supplied feature must be in place prior to installation of the 3666. Details are available from the N. Y. State Department of Labor, Division of Safety and Health, Two World Trade Center, New York, N. Y. 10047.

Supplies: A window, Part No. 5563123, will need to be ordered to replace the existing window periodically as it becomes excessively scratched. See M 10000 pages for ordering instructions. For copies of the UPC Symbol Specification and the UPC Guidelines Manual, write to: Distribution Codes, Inc. 401 Wythe Street Alexandria, Virginia 22314

SPECIFY: [1] Cable Requirements: See the 3663 Supermarket Terminals "Machines" pages.

IB 3667 CHECKOUT SCANNER

Purpose: Fixed head optical reader for the 3650 Programmable Store System and 3660 Supermarket System. The 3667 is 28 inches (71.1 cm) high and it is particularly adaptable to:

- Checker unload mode of checkout
- Seated checker operation

Highlights: Reads the regular (Version "A") and the zero suppression (Version "E") industry standard Universal Product Code (UPC) symbols on manually fed supermarket items placed symbol down on the scanner window ... when used with the 3650 Programmable Store System, can also read industry standard European Article Numbering (EAN-13) symbols (when used with the 3650 Programmable Store System, interpretation of all symbols is done by the user application program) ... item velocity meets the industry's Symbol Standardization Subcommittee requirement for up to 100 inches per second ... packaged as the front end of a total checkstand design ... one 3667 can operate with one 3663 Supermarket Terminal mdl 1, mdl 1P or mdl 2. The 3667 contains a laser system which complies with the safety standards of the United States Department of Health, Education, and Welfare (Performance Standard for Laser Products, August 2, 1976 - Class 1, 21 CFR Subchapter J) only when properly attached to an IBM 3663 mdl 1 or mdl 1P with features #1761, #1762 or #1763, #1764 or equivalent.

PREREQUISITES: If the 3667 is to operate with a 3663 mdl 1 or mdl 1P, the 3663 mdl 1 or mdl 1P requires Checksum Scanner Adapter (#1761) or Checkout Scanner Adapter Type 2 (#1763). If the 3667 is to operate with a 3663 mdl 2, the 3663 mdl 1 or mdl 1P to which that 3663 mdl 2 is attached requires either Checksum Scanner Adapter Type 2 (#1763) and 2nd Checkout Scanner Adapter Type 2 (#1764), or Checkout Scanner Adapter (#1761) and 2nd Checkout Scanner Adapter (#1762).

Customer Responsibility: Refer to Installation Manual - Physical Planning, GA27-3079, for the 3660 Supermarket System for correct ambient light intensity requirement. A number of states presently have, and others are considering the adoption of, regulations governing the use of laser products. Users should determine the extent of regulation in their state. New York state currently requires an attachment to the checkstand. This user-supplied feature must be in place prior to installation of the 3667. Details are available from the N. Y. State Department of Labor, Division of Safety and Health, Two World Trade Center, New York, N. Y. 10047.

The 3667 Scanner must be mechanically restrained in its final mounted position. During maintenance, the 3667 can be tipped forward by a downward force in the extended components drawer. The customer must provide this restraint. Unless the 3667 is restrained from tipping by the geometry of the checkstand, an IBM provided Safety Clip or Safety Bracket must be ordered for each 3667. It is the responsibility of the customer to locate and install the restraining hardware. (See Specity Item [4]).

Supplies: A window, IBM Part No. 5563123, will need to be ordered to replace the existing window periodically as it becomes excessively scratched. See M 10000 pages for ordering instructions. For copies of the UPC Symbol Specification and the UPC Guidelines Manual, write to: Distribution Codes, Inc. 401 Wythe Street Alexandria, Virginia 22314

SPECIFY: [1] Cable Requirements: See the M 3666 pages.

[2] Packaging: If the machine is to be installed in N. Y. State, specify #9550 for additional labeling to meet current regulations. If machine is to be installed in the State of Texas, specify #9551 for additional labeling to meet current requirements:

ATP/ MLC

PRICES: Mdl 5 yr Purchase* MMMC
3666 1 $ 147 $ 3,560 37.50

Warranty: B Purchase Option: 55% Machine Group: D User Life Category: 2 Cell: 3 Lower Left Charge Months: 6 Termination Charge Percent: 20% Upper Limit Percent: 5%

* Pilot Test applies: FTP Option Percent: 70%

For copies of the General Specifications for the Article Symbol Marking (EAN) write to: Secreteraire General E. A. N. Rue de la Chancellerie 14 - 1000, Bruxelles

Specify: [1] Cable Requirements: See the M 3666 pages.

[2] Packaging: If the machine is to be installed in N. Y. State, specify #9550 for additional labeling to meet current regulations. If the machine is to be installed in the State of Texas, specify #9551 for additional labeling to meet current regulations.

[3] Scan Direction: Specify #9604 for Normal Scan Direction. This is typically used for Over the Counter (OTC) operation, sometimes referred to as checker unload. Specify #9605 for Optional Scan Direction. This is typically used for Over the End (OTE) operation, sometimes referred to as customer unload. See IBM 3650 Programmable Store System Installation Manual - Physical Planning, GA27-3167, or IBM 3660 Supermarket Systems Installation Manual - Physical Planning, GA27-3079, for illustration of scan direction options.

[4] See 3660 System Installation Manual - Physical Planning, GA27-3079 to determine the type of restraining hardware desired. Order one of the following for each 3667 to be installed:
IBM 3669 STORE COMMUNICATIONS UNIT

Purpose: To provide communications for the 3650 Programmable Store System and 3660 Supermarket System over common carrier network facilities between a 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75 and:

1) The host S/370 or 4300 Processor via an IBM 3872 Modem or equivalent or IBM 2400 bps Integrated Modem of an IBM 3704 or 3705 Communications Controller with switched line features, or a Communications Adapter (#1601) feature on the 4331.

2) The store loops of another predesignated store location via another 3669 at that location, to provide backup operation for that store in case its 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75 is inoperative.

3) The 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75 in the predesignated store via the 3669 in that store for the purpose of data reconciliation when the backup operation is terminated. If both Store Controllers are 3650 mdl 75, communication can also be performed for purposes other than backup data reconciliation.

The 3669 is designed to operate at 2400 bps over a switched telephone network. This unit is equipped with an Automatic Answering facility but requires manual dialing. The connection to the telephone network is made through a CBS type data access arrangement which must be ordered from the telephone company.

Highlights: The 3669 is a stand-alone synchronous signal converter designed to connect either an IBM 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75 to the common carrier communications network. A switch provides the controls for connecting the 3669 to the 3651 mdl A60, B60, A75, B75, C75 or D75 or to the store loops. Diagnostic test functions are normally under control of the 3651 mdl A60, B60, A75, B75, C75 or D75 during initial power on. An additional switch setting allows the performance of a manual diagnostic test. Auto answer is included as a standard feature.

Attachment: One cable is provided to attach to a CBS Data Access Arrangement line. One cable is provided to interface to the store loop.

PREREQUISITES: [1] A 3650 Programmable Store System or a 3660 Supermarket System (equipped with an IBM 3651 Store Controller mdl A60, B60, A75, B75, C75 or D75) ... [2] A switched line communications facility with Type CBS Data Access Arrangement ... [3] A store loop equipped with at least one IBM 3663 Supermarket Terminal mdl 1 or mdl 1P ... [4] Communications with any virtual storage S/370 or 4300 processor (3033, 3033 MP, 3158 MP, 3168, 3168 MP, VTAM only, 4331, 4341) (165 II BTAM only) via the 3704 or 3705 or an ICA (BTAM only) on a S/370 mdl 115, 125, 135, 135-3, or 136, or a Communications Adapter (#1601) feature on the 4331.


Specify: Voltage (AC, 1-phase, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. For non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

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IBM DP Machines

IBM 3683 POINT OF SALE TERMINAL

Purpose: A user programmable input/output terminal for the IBM 3680 Programmable Store System which provides the point of sale transaction, data collection, credit authorization, price look-up and other inquiry and data entry functions. The self contained program allows users to connect the 3683 to continue all sales functions when disconnected from the 3684 Point of Sale - Control Unit, and after receiving a program load from the 3684.

Highlights: A modular input/output unit with features that provide for an integrated or distributed terminal. It features data entry by keyboard or by a Magnetic or OEM OCR Wand, and data output via an 8 digit numeric display; 32 indicators for operator guidance and machine status conditions; and printing of data under program control. The minimum configuration must include a base unit plus a Keyboard and a Display ... see “Prerequisites.” The 3684 mdl 2 is capable of transmitting or receiving data with several 3683s over a 2400 bps loop.

Base Unit: Provides (1) the base electronic storage and intelligence and an audible alarm; and (2) a matrix printer with cash receipt station. Basic storage is 32K bytes. This can be increased to 56K bytes by Storage Increment features. An Audible Alarm, activated when predetermined events require operator attention or intervention for system operation, is also part of the base unit.

Printer: A matrix, bi-directional printer which prints a 38 character print line at a character speed of 25.4mm (1 inch) spacing. Vertical line spacing is 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. It uses an easily replaceable cartridge ribbon. In addition to the standard character sets, an all-points addressable capability allows (by customer programming) printing of customer logo and special graphics. Additional print stations can be ordered as optional features. The cash receipt station will accept 88.9mm (3-1/2 inch) diameter roll paper, 69.85mm (2-3/4 inches) wide.

PREREQUISITES: 1) A 3684 Point of Sale - Control Unit mdl 2 provides the control segment for the 3683. See 3684 Machines pages for details. 2) A Keyboard (#4921, #4922 or #4923) and a Display (#3331 or #3332) must be ordered for each 3683.

Customer Responsibilities: 1) See 3680 Programmable Store System in “Systems” for general description of customer responsibilities. 2) The following statement is to be included in proposals:

“IT is agreed that IBM will have no responsibility to provide warranty or maintenance service on an IBM 3683 Point of Sale Terminal when cash is contained in the unit. It shall be the purchaser’s (customer’s) responsibility to remove, control, and replace cash so that IBM can fulfill its warranty and maintenance obligations. The exception to the above shall be when a failure occurs in the cash drawer and it cannot be opened prior to CE maintenance. In those cases the customer shall assign one of his personnel to assume responsibility for removal of the cash once the drawer opens.

Customer Set-Up: The 3683 will be shipped with customer set-up instructions. The customer is responsible for:
--- unpacking, placement, set up and check out of the 3683 at time of delivery, or when relocating the 3683.
--- relocation of the 3683 (if required) to allow IBM service access.
--- using and following the 3683 Problem Determination Procedures.

Environment: See 3680 Programmable Store System in “Systems.”

Maintenance: 3683s located in the independent sales area may preclude the customer's acceptability of online repair due to the public scrutiny and loss of the selling location for customer service. In these cases, the customer should remove the failing unit to a repair facility located within the store for subsequent repair. At this location the CE will repair and test the unit.

Supplies: [1] A black ribbon cartridge, IBM Part No. 7034640 or equivalent, if required. [2] Roll paper 89.9mm (3.5 inch) diameter, 69.85mm (2.75 inch) wide is required for the Cash Receipt and Journal print stations.

SPECIFY: [1] Voltage (120V AC, 1-phase, 3-wire, 60Hz), $9890 for locking plug, or $9891 for non-lock plug. If the standard 2.8 meter (9 foot) power cable is not desired, specify #9511 for 1.8 meter (6 foot) cable. NOTE: 120V is compatible with existing 115V systems.

PRICES: Mdl 3683 $81 5 yr Purchase $2,655** AMMCR $10.50

Plan Offering: Plan D Purchase Option: 55% Maintenance: D Warranty: B Useful Life Category: 2 Per Call: 1 Termination Charge Modification Termination Charge Percent: 20% Initial Period of Maintenance Service: 3 months Upper Limit Percent: 5%

SPECIAL FEATURES

KEYBOARDS: GENERAL: All keyboards have customer legenda­ble key buttons except for 11 key buttons which have molded leg­ends. All single and double function keys are under customer program control. Double keys may be moved, added, or deleted by the user. Several colors and sizes of decal sheets with com­mon legends will be shipped with the 3683. See accessories section M10000 for released key buttons that may be ordered for any unique customer requirement. Maximum: One Keyboard (#4921, #4922 or #4923). Field Installation: Yes.

35 KEY MODIFIABLE KEYBOARD (#4921): A 35 key keyboard that includes:
1) 5 Legended system control keys.
19 Unlegended function keys.
11 Keys with dual legends on each keybutton, “numeric” and “transaction type”, in the data entry arrangement.

48 KEY MODIFIABLE KEYBOARD (data #4922): A 48 key keyboard that includes:
5 Legended system control keys.
32 Unlegended function keys.
11 Keys with dual legends on each keybutton, “numeric” and “transaction type”, in the data entry arrangement.

48 KEY MODIFIABLE KEYBOARD (adding machine) (#4923): A 48 key keyboard that includes:
5 Legended system control keys.
32 Unlegended function keys.
11 Keys with round numeric legended keybuttons in the adding machine arrangement.

DISTRIBUTED KEYBOARD ATTACHMENT (#3240). Provides for locating the keyboard up to 3.6 meters (12 feet) from the 3683 base. Field Installation: Yes. Prerequisite: Keyboard - #4921, #4922 or #4923.

DISPLAY-ONE SIDED (#3331). An operator display and guide­ance unit consisting of a 8-digit numeric display and 32 indicators for operator guidance and machine status. The display is used to display numeric input or output data such as item number, totals, amount due, etc. The 32 indicator lights point to labels that de­scribe machine status or guidance. The unit will be shipped with the indicators labeled. However, the customer may relabel all but five indicators and, under customer program control, define their use. A legend sheet with a variety of legends will be shipped with each machine. Maximum: One. Field Installation: Yes. Limitation: Cannot be ordered with Display-Two Sided (#3332).

DISPLAY-TWO SIDED (#3332). An operator and customer dis­play guidance unit which contains all the functions of Display-One Sided (#3331) plus an 8-digit numeric display with 6 indicators on the back of the unit for customer viewing. Maximum: One. Field Installation: Yes. Limitation: Cannot be ordered with Display-One Sided (#3331) or Display-Customer Remote (#3333).

DISPLAY-CUSTOMER REMOTE (#3333). A customer display and status indicator unit that is connected to the 3683 by a 3.6 meter (12 foot) cable. The unit consists of an 8-digit numeric display and 12 indicators (6 are shipped with labels and 6 without). All are relegendable. The display and indicators are under customer program control. Maximum: One. Field Installation: Yes. Limitation: Cannot be ordered with Display-Two Sided (#3332). Prerequisite: Display-One Sided (#3331).

DISTRIBUTED DISPLAY ATTACHMENT (#3335). Provides for distributing Display-One Sided (#3331) or Display-Two Sided (#3332) up to 3.6 meters (12 feet) from the 3683 base. Maximum: One. Field Installation: Yes. Prerequisite: Display-One Sided (#3331) or Display-Two Sided (#3332).

CASH DRAWER-INTEGRATED-FIRST (#1571). Provides a cash drawer with housing and removable till that is integrated with the 3683 base unit. The cash drawer has a media slot that will accommodate approximately a 25mm (1 inch) stack of documents. Opening the cash drawer is under program control. A cash drawer lock is provided. See note below for special ordering instructions for lock and removable bill dividers. Maximum: One. Field Installation: Yes. Limitation: Only one cash drawer may be ordered -- either Cash Drawer-Integrated-Second (#1573), Cash Drawer-Distributed (#1575), or OEM Cash Drawer Attachment (#1577).

** Pilot Test Plan available. Purchase Pilot Option: 70%
VALIDATION PRINTER (#8725). Provides a flat bed document validation station for printing on inserted forms. Prints 38 characters per line at 25.4mm (1 inch) spacing is 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. The all-points addressable characteristics of the printer allows, special graphics highlighting to be designed and printed by user programming. Maximum: One. Field Installation: Yes.

STORAGE INCREMENTS:

NOTE: When storage is upgraded by field installation, the new Storage Increment feature replaces the old. Removed parts belong to the customer.


STORAGE INCREMENT-16K (#7720). Provides an additional 16,384 bytes of storage. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with Storage Increment-8K (#7710) or 24K (#7730). Note: If Storage Increment-8 (#7710) or 16K (#7720) is installed, it must be removed to install this feature.

STORAGE INCREMENT-24K (#7730). Provides an additional 24,576 bytes of storage. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with Storage Increment-16K (#7720) or 24K (#7730). Note: If Storage Increment-8 (#7710) or 16K (#7720) is installed, it must be removed to install this feature.

TOTALS RETENTION (#8010). Provides an additional 240 bytes of printer programmable storage that is powered by its own battery to protect loss of information such as totals, transaction number, terminal address, etc. When power is turned off or power interruptions occur, an early warning status condition will be given to the program when the battery needs replacing. Replacement batteries are to be provided, installed, and removed by the customer. IBM will replace the battery if requested by the customer on a time and material basis. (See M10000 pages for battery life characteristics and types of batteries required for replacement.) Maximum: One. Field Installation: Yes.

STORAGE RETENTION (#7785). Provides an internal battery and charger to power storage during a power interruption. All data and programs are protected so that a transaction in process when power is interrupted will continue when primary power is restored. The duration of storage retention depends on the charged state of the battery. When fully charged, storage will be retained for approximately 12 minutes. The number of times the battery is discharged greatly affects battery life, therefore facilities are provided to allow the customer, through programming, to deactivate the battery for scheduled power off conditions such as store closing. Replacement batteries are to be provided, installed, and removed by the customer. IBM will replace the battery if requested by the customer on a time and material basis. Replacement batteries may be ordered through IBM (see M10000 pages) or through other sources that meet the supply battery specifications as defined by IBM. Maximum: One. Field Installation: Yes.

EXPANSION FEATURE (#3880). Provides facilities to accommodate additional features that cannot be installed on the base unit. This feature is a prerequisite to install any of the following:

  -- IML Read Adapter (#4633)
  -- Magnetic Wand Reader (#4945)
  -- OCR Wand Reader Adapter (#5422)

Maximum: One. Field Installation: Yes.

IML READ ADAPTER (#4633). Provides a means to initialize 3683 terminals when a 3684 mdl 2 is unavailable or unable to provide the IML (Initial Machine Load). An adapter is provided for attaching an external user provided tape cassette recorder and reading data previously recorded at a 3684 mdl 2 with the IML Write Adapter (#4634). (Refer to "IBM 3680 Programmable Store System Introduction Manual", [SRL No. to be furnished at a later date] for cassette recorder interface requirement.) Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with OCR Wand Adapter (#5422). Prerequisite: Expansion Feature (#3880).

MAGNETIC WAND READER (#4945). A hand operated wand used to read single track delta distance encoded magnetic merchandise tickets, credit cards, etc. The small light-weight Wand attached via a 1.2 meter (4 foot) long flexible cord, allows encoded merchandise tickets to be read without removing them from the merchandise. See Note below. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with OCR Wand Adapter (#5422). Prerequisite: Expansion Feature (#3880).

NOTE -- The minimum encoding specifications that must be met by suppliers of credit cards, merchandise tickets and employee badges will be furnished upon request.

OCR Wand Adapter (#5422). Provides an adapter to support the enrichment of an OEM OCR Wand (Recognition Products, Inc., OCR Wand or equivalent that meets the OCR Wand Interface
3683 Point of Sale Terminal (cont’d)
Specifications dated 10/17/75 to the 3653 Point of Sale Terminal. This feature provides a 1.83 meter (6 foot) cable with an ITT-Cannon DBC-25S type connector to attach the OEM OCR Wand unit. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with Magnetic Wand Reader (#4945).

Prerequisite: Expansion Feature (#3880).

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<th>AMMCR/</th>
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IBM 3684 POINT OF SALE - CONTROL UNIT

Purpose: A user programmable input/output, data collection and processing terminal with a 985,088 byte integrated diskette for the IBM 3680 Programmable Store System.

Model 1 Single unit
Model 2 Master unit

The 3684 mdl 1 is designed for single terminal stores. It contains a single programmable segment with appropriate features to allow the user to perform the point of sale, data collection, credit authorization, price look-up, inquiry, data entry and host communication functions. The point of sale features and functions are similar to the 3683 Point of Sale Terminal.

The 3684 mdl 2 is designed to perform the point of sale function and to act as a master to six or eight multiple terminal stores. Two self contained programmable segments, one to perform the point of sale function similar to the 3683, and the second to perform the communication function for communication with its own point of sale segment and with additional loop-attached 3683 terminals. In addition, the control segment controls the diskette and host communication input/output functions.

Highlights: A modular input/output unit with features that provide for an integrated or a limited distributed (cash drawer and display) package. It features data entry by keyboard or from a Magnetic or Cipher Control Reader, data output by an 8 digit numeric display, 32 indicators for operator guidance and machine status conditions, and printing of input or output data under program control. It features a cash drawer with removable till and adjustable divider option. An integrated diskette is used for customer program storage, data and table storage, diagnostic programs and error logging. The minimum configuration must include a base unit plus a keyboard and a display. (See Prerequisites.)

Base Unit: Consists of [1] programmable segments and storage (Model 1 has 56K; Model 2 has 32K for the point of sale segment and 56K for the control segment); [2] a matrix printer with a cash receipt station; and [3] a 985,088 byte diskette drive. An Audible Alarm, activated when predetermined events require operator attention or intervention for system operation, is also part of the base unit.

Printer: A matrix, bi-directional printer which prints a 38 character print line at 15 characters per 25.4mm (1 inch) spacing. Vertical line spacing is adjustable in 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. It uses an easily replaceable cartridge ribbon. In addition to the standard character sets, an all-points addressable capability allows (by customer programming) printing of logos and special graphics. Additional print stations can be ordered by special feature. The cash receipt station will accept 88.9mm (3-1/2") diameter roll paper, 68.5mm (2-3/4") wide.

Diskette: A 985,088 byte Diskette 2D is used on both models. The diskettes are formatted to 256 byte blocks. The diskette is removable and interchangeable.

Communications: All 3684 models have BSC or SDLC communication capability. Depending on customer selection at system generation, either or both protocols may reside in the terminal and either may become active when loaded from the diskette.

System Attachment: The 3684 mdls 1 and 2 attach to any virtual storage S/370 or 3704 Processor via a 3704 or 3705 Emulation Mode (or Integrated Communications Adapter) for BSC systems and in NCP/VS mode for SDLC systems. Attachment is over communication lines at speeds of 1200, 2400 or 4800 bps.

Communications Facilities: The 3684 operates in data half-duplex point-to-point or multipoint mode on half-duplex or duplex facilities at transmission speeds of 1200/600, 2400/1200, 4800/2400 bps on nonswitched facilities. In addition, the 3684 also operates in half-duplex point-to-point mode at transmission speeds of 1200/600, 2400/1200 and 4800/2400 bps on switched facilities. See Model M 2700 pages.

Modems: A 1200 bps Integrated Modem (#5550) feature or an external modem may be attached to a 3684. External modems require the External Modem Interface (#3701) feature.

IBM Modems Speed (bps)
3872 model 1 2400/1200
3874 model 1 4800/2400

Switched network backup operation with Manual Call and Manual or Auto Answer is not available. For communications capabilities, product utilization and special features, see Model M 2700, M 3872 and M 3874 pages.

In Store Communications: The 3684 mdl 2 performs a master control function for 3683s that are attached to the 3684 by a 2400 bps loop. Interactive communication capability exists between the 3684 and 3683s for data collection, price look-up, credit, and diagnostic facilities.

All models of the 3684 receive their initial machine load (IML) from a S/370 or 4341 host processor either by physical diskette transport or by teleprocessing. The 3684 IML and the IML's for 3683s associated with a 3684 mdl 2 are maintained on the diskette. The 3684 mdl 2 transmits the 3683 IML when requested by the 3683.

PREREQUISITES: [1] A 3704 or 3705 in 2701, 2703 Emulation Mode (or Integrated Communications Adapter) for BSC systems and in NCP/VS Mode for SDLC systems (with appropriate features ... see M 3704 and 3705 pages) attached to any virtual storage S/370 or 4341 Processor ... [2] A keyboard unit (#9421, #9422 or #9423) and a display (#3331 or #3332) must be ordered for each 3684 ... see 'Special Features.'

Customer Responsibilities: 1) See 3680 Programmable Store System in 'Systems' for general description of customer responsibilities. 2) The following statement is to be included in proposals:

"It is agreed that IBM will have no responsibility to provide warranty for maintenance service on an IBM 3684 Point of Sale - Control Unit when cash is contained in the unit. It shall be the purchaser's (customer's) responsibility to remove, control, and replace cash so that IBM can fulfill its warranty and maintenance obligations.

The exception to the above shall be when a failure occurs in the cash drawer and it cannot be opened prior to CE maintenance. In those cases the customer shall assign personnel to assume responsibility for removal of the cash once the drawer has opened."

Customer Set-Up: The 3684 will be shipped with customer set-up instructions. The customer is responsible for:

- Unpacking, placement, set up and check out of the 3684 at time of delivery, or when relocating the 3684.
- Relocation of the 3684 (if required) to allow IBM service access.
- Using and following the Problem Determination Procedures.
- Physical set up and connection of cables to TP lines/modems.

Environment: See 3680 Programmable Store System in 'Systems.'

Maintenance: 3684s located in the immediate sales area may preclude the acceptability of repair due to the public scrutiny and loss of the selling location for customer service. In these cases, the customer should remove the unit to a repair facility located within the store for subsequent repair. At this location the CE will repair and test the unit.

Supplies: [1] A black ribbon cartridge, IBM Part No. 7034640 or equivalent, is required ... [2] Diskette 2D, IBM Part No. 1766872 or equivalent, formatted with 256 byte blocks is required for 3684 mdls 1 and 2 ... [3] Roll paper 88.9mm (3.5 inch) diameter, 68.95mm (2.75 inch) wide is required for the Cash Receipt and Journal Print stations.

SPECIFY:
[1] Voltage (120V AC, 1-phase, 3-wire, 60Hz): #9890 for locking plug, or #9891 for non-lock plug. If standard 2.5 meter (9 foot) power cable is not desired, specify #9511 for 1.8 meter (6 foot) cable. NOTE: 120V AC is compatible with existing 115V systems.

[2] Controller Designation: Specify #9491 on the first 3684 to be used with a host system location and specify #9492 on each additional 3684 in the network.

When #9491 is specified, additional information must be specified as follows:
1) Specify one of the following to indicate magnetic tape density (media) used at the host system location. This tape media is available under DOS/VS and OS/VS2 only.
   #9412 -- 9 track 800 bps
   #9413 -- 18 track 1600 bps
   #9414 -- 9 track 6250 bps

If magnetic tape is not used at the host system specify one of the following media which is available under DOS/VS only:
   #9421 -- 2316 Disk Pack
   #9422 -- 3336 Disk Pack mdl 1
   #9423 -- 3336 Disk Pack mdl II
   #9424 -- 3346 Data Module

The 3684 control data will be sent via the specified media to the IBM Programming Systems Representative at the host system location for installation. If disk media is required, the IBM disk media will be returned to the plant location after installation of the controller data.

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One is furnished at no charge to each 3684 mdl 2 site for testing store loop wiring.

** PRICES:**

<table>
<thead>
<tr>
<th>MLC</th>
<th>MM/MC/</th>
<th>5 yr Purchase AMMCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>3684</td>
<td>1</td>
<td>$127</td>
</tr>
<tr>
<td>2</td>
<td>154</td>
<td>4,300**</td>
</tr>
</tbody>
</table>

Plan Offering: Plan D Purchase Option: 55% Maintenance: D Warranty: B Useful Life Category: 2 Termination Charge Months: 6 Termination Charge Percent: 20% Initial Period of Maintenance Service: 3 months Upper Limit Percent: 5% 

Model Changes: Model changes are field installable. The parts removed for a model change become the property of IBM.

### SPECIAL FEATURES

**KEYBOARDS, GENERAL:** All keyboards have customer legendar- 
ble keybuttons except for 11 keybuttons which have molded leg- 
ends. All single and double function keys are under customer 
program control. Double keys may be moved, added, or deleted 
by the user. Several colors and sizes of decal sheets with com-
mon legends will be shipped with the 3684. See accessories 
section M10000 for released keybuttons that may be ordered for 
any unique customer requirement. Maximum: One keyboard 
(#4921, #4922 or #4923). Field Installation: Yes. 

#### 35 KEY-MODIFIABLE KEYBOARD (#4921): A 35 key keyboard that includes:
- 5 Legended system control keys.
- 19 Unlegended function keys.
- 11 Keys with dual legends on each keybutton, "numeric" and "transaction type", in the data entry arrangement.

#### 48 KEY-MODIFIABLE KEYBOARD (Data Entry) (#4922): A 48 key keyboard that includes:
- 5 Legended system control keys.
- 32 Unlegended function keys.
- 11 Keys with dual legends on each keybutton, "numeric" and "transaction type", in the data entry arrangement.

#### 48 KEY-MODIFIABLE KEYBOARD (Adding Machine) (#4923): A 48 key keyboard that includes:
- 5 Legended system control keys.
- 32 Unlegended function keys.
- 11 Keys with round numeric legended keybuttons in the adding machine arrangement.

**DISPLAY-ONE SIDED (#3331):** An operator display and guid- 
ance unit consisting of an 8-digit numeric display and 32 indica-
tors for operator guidance and machine status. The display 
is used to display numeric input or output data such as item number, credit number, totals, amount due, etc. The 32 indicator lights 
point to labels that describe: (1) Machine status such as: Ready, 
Wait, Offline, etc., (2) step by step guidance to lead the operator 
through a transaction or procedure. The unit will be shipped with 
the indicators labeled. However, the customer may relabel all but 
five indicators and, under customer program control, define their 
use. A legend sheet with a variety of legends is provided. 
The display and indicators are under customer program control. Maximum: One. Field Installation: Yes. Limitation: Cannot be ordered with Display-Two Sided (#3332). Prerequisite: Display-One Sided (#3331). 

**DISPLAY-TWO SIDED (#3332):** An operator and customer dis- 
play guidance unit which contains all the functions of Display-One 
Sided (#3331) plus an 8-digit numeric display with 6 indicators on 
the back of the unit for customer viewing. Maximum: One. Field 
Installation: Yes. Limitation: Cannot be ordered with Display-One 
Sided (#3331) or Display-Customer Remote (#3333). 

**DISPLAY-CUSTOMER REMOTE (#3333):** A customer display and status indicator unit that is connected to the 3684 by a 3.6 meter (12 foot) cable. The unit consists of an 8-digit numeric display and 12 indicators (6 are shipped with labels and 6 without). All are relegendable.

---

**NOTE:** Not to be reproduced without written permission.
3684 Point of Sale - Control Unit (cont'd)

Manager keylock or diskette cover lock for each terminal.

(The 3683 and 3684 use the same journal lock and manager keylock numbers, therefore all terminals within a store could have the same lock if desired.) If the same lock is desired on the journal, manager keylock and diskette cover, specify the respective locks with the same value in the last digit. That is, if #2003, #9303 and #9213 are specified, the same locks will be installed at all locations.

Journal Lock
Manager Keylock
Diskette Cover Lock

#9201 #9202 #9203 #9204 #9205
#9207 #9208 #9302 #9303 #9304
#9209 #9210 #9209 #9309 #9211

If none is specified, a lock will be selected at random from a larger group of lock types. Each lock feature will be shipped with the keys. For additional or replacement keys, refer to M10000 pages.

VALIDATION PRINTER (#8725).
Provides for a flat bed document validation station for printing on inserted forms. Prints 38 characters per line at 15 characters per 25.4mm (1 inch). Vertical line spacing is 6.3 lines per 25.4mm (1 inch) at a rate of 20 lines per second. The all-points addressible characteristics of the printer allow logos, special graphics and highlighting to be designed and printed by user programming.

Maximum: One.
Field Installation: Yes.

STORAGE INCREMENTS:

NOTES: 1) Storage increments apply to the point-of-sale segment of the 3684 (mdl 2 only) ... 2) When storage is upgraded by field installation, the new Storage Increment feature displaces the old.

Removed parts belong to the customer.

STORAGE INCREMENT - 8K (#7710).
Provides an additional 8,192 bytes of storage.
Maximum: One.
Field Installation: Yes.
Limitation: Cannot be installed with Storage Increment - 16K (#7720) or Storage Increment - 24K (#7730).

STORAGE INCREMENT - 16K (#7720).
Provides an additional 16,384 bytes of storage.
Maximum: One.
Field Installation: Yes.
Limitation: Cannot be installed with Storage Increment - 8K (#7710) or Storage Increment - 24K (#7730).

STORAGE INCREMENT - 24K (#7730).
Provides an additional 24,576 bytes of storage.
Maximum: One.
Field Installation: Yes.
Limitation: Cannot be installed with Storage Increment - 8K (#7710) or Storage Increment - 16K (#7720).

TOTALS RETENTION (#8010).
Provides an additional 240 bytes of customer programmable storage that is powered by its own battery to protect loss of information such as totals, transaction number, terminal address, etc., when power is turned off or power interruptions occur. An early warning status condition will be given to the program when the battery needs replacing. Replacement batteries are to be provided, installed and removed by the customer. IBM will replace the battery if requested by the customer on a time and material basis. See M10000 pages for battery life characteristics and types of batteries required for replacement.

Maximum: One.
Field Installation: Yes.
Limitation: Applies to the 3684 mdl 1 and to the point of sale segment of the 3684 mdl 2.

STORAGE RETENTION (#7785).
Provides an internal battery and charger to power storage during a power interruption. All data and programs are protected so that a transaction in process when power was interrupted will continue when primary power is restored. The duration of storage retention depends on the charged state of the battery. When fully charged, storage will be retained for approximately 12 minutes for a model 1 and approximately 6 minutes for a model 2. The number of times the battery charged greatly affects battery life, therefore facilities are provided to allow the customer, through programming, to deactivate the battery for scheduled power off conditions such as store closing. Replacement batteries are to be provided, installed and removed by the customer. IBM will replace the battery if requested by the customer on a time and material basis. Replacement batteries may be ordered through IBM (see M10000 pages) or through other sources that meet the battery specifications as defined by IBM.

Maximum: One.
Field Installation: Yes.

IML-WRITE ADAPTER (#4634).
[Mdl 2 only] Provides the 3684 IML with the ability to write an IML (Initial Machine Load) tape on a user provided tape cassette recorder (refer to IBM 3680 Programmers Manual: Store System Introduction Manual, [SRL (IBM supplied) must be provided] for Cassette Recorder interface requirement), which can be read by a 3683 Point of Sale Terminal equipped with an IML-Read Adapter (#4633) feature. Maximum: One.
Field Installation: Yes.

EXPANSION FEATURE (#3890).
[Mdl 1 only] Provides additional facilities on the 3684 mdl 1 to accommodate features that can be the installed on the base unit. This feature is a prerequisite to install the Magnetic Wand Reader (#4945) or the OCR Wand Adapter (#5422). Maximum: One.
Field Installation: Yes.

Note: No Expansion Feature is required on the 3684 mdl 2 to install any applicable features.

MAGNETIC WAND READER (#4045).
A hand operated wand used to read single track delta distance encoded magnetic merchandise tickets, credit cards, employee badges, etc. The small light-weight wand attached via a 1.2 meter (4 foot) long flexible cord, allows encoded merchandise tickets to be read without removing them from the merchandise. See Note below.

Maximum: One.
Field Installation: Yes.
Limitation: Cannot be installed with OCR Wand Adapter (#5422).
Prerequisite: Expansion Feature (#3890) must be installed on the 3684 mdl 1.

Note -- The minimum encoding specifications that must be met by suppliers of credit cards, merchandise tickets and employee badges will be furnished upon request.

OCR WAND ADAPTER (#5422).
Provides an adapter to support the attachment of an OEM OCR Wand (Recognition Products, Inc., OCR Wand or equivalent that meets the OCR Wand Interface Specifications dated 10/17/75 to the 3653 Point of Sale Terminal). This feature provides a 1.83 meter (6 foot) cable with an ITT--Cannon BDBC-25S type connector to attach the OEM OCR Wand unit.

Maximum: One.
Field Installation: Yes.
Limitation: Cannot be installed with Magnetic Wand Reader (#4945).
Prerequisite: Expansion Feature (#3890) must be installed on 3684 mdl 1.

TELECOMMUNICATION FEATURES

A 3684 may be equipped with either the External Modem Interface or the 1200 bps Integrated Modem feature.

Note: A 6.1 meter (20 foot) communication cable is provided for attachment to a stand-alone modem or to communications facility when an integrated modem is used. If a standard 6.1 meter communication cable is not desired, specify: #9061 for 3 meter (10 foot) cable, #9062 for 9.1 meter (30 foot) cable, or #9063 for 12.2 meter (40 foot) cable.

1200 BPS INTEGRATED MODEM (#5530).
Provides an integrated modem for operation over switched or nonswitched communication facilities at 1200 bps. Auto answer is provided when operating over switched network. No external modem is required.

Maximum: One.
Field Installation: Yes.
Limitation: Cannot be installed with External Modem Interface (#3701).
Specify: Specify the following when ordering this modem:

Specify One:
#9481 for Switched Network
#9482 for Nonswitched Network

If #9482 Nonswitched Network is specified, also specify one:
#9651 for 4 wire facility
#9652 for 2 wire facility

Note: If Switched Network (#9481) is specified, a data access arrangement type CBS, or FCC registered equivalent is required.

EXTERNAL MODEM INTERFACE (#3701).
Provides an EIA interface for attachment of an IBM or other external modem.

Maximum: One.
Field Installation: Yes.
Limitation: Cannot be used with 1200 bps Integrated Modem (#5530).
Specify: Specify the following as applicable:

[1] Specify #9695 if the 3684 is required to provide clocking.

[2] Specify one of the following transmission speeds:
- #9820 for 1200 bps
- #9822 for 2400 bps
- #9823 for 4800 bps

NOTE: Half speeds are derived through programming.

[3] Specify #9126 if the IBM 3872 or 3874 Modem is ordered.

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### Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature Description</th>
<th>MLC</th>
<th>Purchase</th>
<th>MMC/AMMCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 Key-modifiable Keybd #4921</td>
<td>6</td>
<td>$150</td>
<td>$1.50</td>
</tr>
<tr>
<td>48 Key-modifiable Keybd #4922</td>
<td>6</td>
<td>165</td>
<td>1.50</td>
</tr>
<tr>
<td>Display-One Sided</td>
<td>3331</td>
<td>7 200</td>
<td>2.00</td>
</tr>
<tr>
<td>Display-Two Sided</td>
<td>3332</td>
<td>13 300</td>
<td>3.00</td>
</tr>
<tr>
<td>Display-Customer Remote</td>
<td>3333</td>
<td>8 240</td>
<td>1.50</td>
</tr>
<tr>
<td>Dist Display Attach</td>
<td>3335</td>
<td>1 15</td>
<td></td>
</tr>
<tr>
<td>Cash Drawer-Int-First</td>
<td>1572</td>
<td>5 150</td>
<td>1.00</td>
</tr>
<tr>
<td>Cash Drawer-Int-Second</td>
<td>1573</td>
<td>7 230</td>
<td>1.00</td>
</tr>
<tr>
<td>Cash Drawer-Distributed</td>
<td>1575</td>
<td>7 230</td>
<td>1.00</td>
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<td>1577</td>
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<td>.50</td>
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<tr>
<td>Journal Printer</td>
<td>4695</td>
<td>4 100</td>
<td>1.00</td>
</tr>
<tr>
<td>Journal Lock</td>
<td>4690</td>
<td>1 30</td>
<td></td>
</tr>
<tr>
<td>Manager Keylock</td>
<td>4905</td>
<td>1 30</td>
<td></td>
</tr>
<tr>
<td>Diskette Cover Lock</td>
<td>3310</td>
<td>1 30</td>
<td></td>
</tr>
<tr>
<td>Validation Printer</td>
<td>8725</td>
<td>6 170</td>
<td>1.00</td>
</tr>
<tr>
<td>Storage Increment-8K</td>
<td>7710</td>
<td>3 113</td>
<td>.50</td>
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<td>Storage Increment-16K</td>
<td>7720</td>
<td>6 225</td>
<td>.50</td>
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<td>Storage Increment-24K</td>
<td>7730</td>
<td>9 338</td>
<td>.50</td>
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<tr>
<td>Totals Retention</td>
<td>7785</td>
<td>6 175</td>
<td>1.00</td>
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<tr>
<td>IML-Write Adapter</td>
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<td>Expansion Feature</td>
<td>3890</td>
<td>3 75</td>
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<tr>
<td>Magnetic Wand Reader</td>
<td>4945</td>
<td>14 391</td>
<td>3.00</td>
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<tr>
<td>OCR Wand Adapter</td>
<td>5422</td>
<td>5 185</td>
<td>.50</td>
</tr>
<tr>
<td>1200 bps Int Modem</td>
<td>5530</td>
<td>15 480</td>
<td>2.50</td>
</tr>
<tr>
<td>External Modem Interface</td>
<td>3701</td>
<td>10 360</td>
<td>.50</td>
</tr>
</tbody>
</table>

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IBM 3704 COMMUNICATIONS CONTROLLER

Purpose: The 3704 attaches to any S/370 or 4300 Processor or, in 2701/2702/2703 Emulation Mode only, to S/360 mds 30 (submodels E or F), 40, 50, 65, 67 (in 65 mode), 75 and 195 for communication with local or remote I/O devices over various common carrier provided or customer owned communication facilities. NOTE: See "Programming" and "SCP" sales manual pages for attachment capability.

Models: The 3704 is available in four models each of which allows attachment of up to 32 communication lines.

- **Model A**: 16K
- **Model A2**: 32K
- **Model A3**: 48K
- **Model A4**: 64K

Highlights: A modular, programmable unit which greatly expands the communications capabilities of S/360, S/370 and 4300 systems. By virtue of its modularity and programmability, the 3704 boasts a high degree of flexibility in tailoring to a teleprocessing system's requirements. Also, it can relieve the CPU of many TP functions, including, but not limited to, line control, polling, addressing, code translation and error recovery.

The 3704 is housed in a 36" x 24" x 57" cabinet which contains the Central Control Unit and the Control Panel. This cabinet also accommodates storage as indicated above, a Remote Program Loader or Channel Adapter, a Communication Scanner, Line Interface Bases and Line Sets to allow attachment of up to 32 communication lines.

The maximum number of communication lines attachable is a function of the speed of the lines, whether a Channel Adapter or Remote Program Loader is installed, the type of Communication Scanner installed, and the mode of operation.

The HONE Configurator is available to assist in configuring a 3704 to a specific TP network's requirements ... see "Specify."

Communication Facilities: The 3704 operates over common carrier provided or equivalent customer owned communication facilities. For information concerning these facilities, see the M 2700 pages, this section. The alphameric designations in the following pages correspond to those in the M2700 pages.

### MACHINE ORGANIZATION

#### Terminal Devices

The 3704 can communicate with the following terminals over the communications facilities and at the speeds indicated ... for further information on features required, see "Special Features" on the following pages.

#### 3704 LOCAL ATTACHMENT (START/STOP)

In addition to terminals being attached to the 3704 through common carrier facilities, they may also be connected directly to the 3704 units using #4713. Below are the attachable terminals and the respective feature #s. Cable groups may be traced via this feature # list and the feature #s listed in the respective Physical Planning Manuals. Ensure that the cable groups selected from the Physical Planning Manuals have the 25 pin data set interface. #4713 allows for two terminals to be attached, each on 3704 25 pin data set interface. There must be corresponding Business Machine Clocks in both the terminal and the 3704.

#### Terminal Speed (bps) Terminal Feature # (s)

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Speed (bps)</th>
<th>Terminal Feature # (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1031A/1034</td>
<td>600</td>
<td>2068</td>
</tr>
<tr>
<td>1061</td>
<td>134.5</td>
<td>9115 or 9120</td>
</tr>
<tr>
<td>2740 mdl 1</td>
<td>134.5</td>
<td>9115 or 9120</td>
</tr>
<tr>
<td>2740 mdl 2</td>
<td>134.5</td>
<td>9115 or 9120</td>
</tr>
<tr>
<td>2741</td>
<td>134.5</td>
<td>9115 or 9120</td>
</tr>
<tr>
<td>2845-2848</td>
<td>1200</td>
<td>9012</td>
</tr>
<tr>
<td>3767 attaches</td>
<td>300</td>
<td>7111 or 7113 w 9541 and 3719 via Line Set 1F</td>
</tr>
<tr>
<td>5010 (S/T)</td>
<td>134.5</td>
<td>1610 w 2165</td>
</tr>
<tr>
<td>5100</td>
<td>134.5</td>
<td>1610 w 2165</td>
</tr>
<tr>
<td>5100/5110</td>
<td>134.5</td>
<td>1525</td>
</tr>
<tr>
<td>5100</td>
<td>134.5</td>
<td>1525</td>
</tr>
</tbody>
</table>

Operation of the 3704 in Start/Stop mode at speeds greater than 600 bps is limited to common carrier leased facilities. For attachment to the 2711 Line Adapter Unit, use #4711 and/or #4714. The terminals may also communicate with a 3704 via Limited Distance Line Adapters ... see Chart 1, M2700 pages.

#### 3704 LOCAL ATTACHMENT (SYNCHRONOUS)

In addition to the synchronous terminals being attached to the 3704 through common carrier facilities, they may also be connected directly to the 3704 using #4716. Below are the attachable terminals and the respective feature #s. Cable groups may be traced via the feature #s given below and the feature #s listed in the respective Physical Planning Manuals. Ensure that the cable groups selected from the Physical Planning Manuals have the 25 pin data set interface. #4716 allows only two terminals to be attached; one per 3704 25 pin data set interface. There must be corresponding Business Machine Clocks in both the terminal and the 3704.

#### Terminal Speed (bps) Terminal Feature # (s)

<table>
<thead>
<tr>
<th>Terminal</th>
<th>Speed (bps)</th>
<th>Terminal Feature # (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1131</td>
<td>600</td>
<td>7690</td>
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<tr>
<td>1131</td>
<td>1200</td>
<td>7690</td>
</tr>
<tr>
<td>1200</td>
<td>7690</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>7690</td>
<td></td>
</tr>
<tr>
<td>2400</td>
<td>7690</td>
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<tr>
<td>1826</td>
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<td>7551 w 7552</td>
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<tr>
<td>1200</td>
<td>7551 w 7552</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>7551 w 7552</td>
<td></td>
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<tr>
<td>2400</td>
<td>7551 w 7552</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td>1200</td>
<td>2074 w 4703</td>
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<tr>
<td>1200</td>
<td>2074 w 4703</td>
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<tr>
<td>2400</td>
<td>2074 w 4703</td>
<td></td>
</tr>
<tr>
<td>2025</td>
<td>1200</td>
<td>7551 w 7541</td>
</tr>
<tr>
<td>2701</td>
<td>600</td>
<td>7699 w 7401</td>
</tr>
<tr>
<td>1200</td>
<td>7699 w 7692</td>
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<td>2400</td>
<td>7699 w 7693</td>
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<tr>
<td>2703</td>
<td>1200</td>
<td>7705 w 7710</td>
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<td>2715 mdl 2</td>
<td>1200</td>
<td>7705</td>
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<tr>
<td>2722</td>
<td>1200</td>
<td>7705 w 7122</td>
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<td>2780</td>
<td>1200</td>
<td>7705 w 7110</td>
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<td>3115</td>
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<td>3125</td>
<td>600</td>
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<td>3125</td>
<td>1200</td>
<td>7141</td>
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<tr>
<td>3125</td>
<td>600</td>
<td>6460 w 9649</td>
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<tr>
<td>3125</td>
<td>1200</td>
<td>6460 w 9649</td>
</tr>
<tr>
<td>4331</td>
<td>600</td>
<td>4331 Communications Adapter (#1601) for details and prerequisites.</td>
</tr>
<tr>
<td>1200</td>
<td>4331 Communications Adapter (#1601) for details and prerequisites.</td>
<td></td>
</tr>
<tr>
<td>4331</td>
<td>2000</td>
<td>4331 Communications Adapter (#1601) for details and prerequisites.</td>
</tr>
<tr>
<td>2400</td>
<td>4331 Communications Adapter (#1601) for details and prerequisites.</td>
<td></td>
</tr>
<tr>
<td>3271 mdl 1,11,12</td>
<td>1200</td>
<td>7820</td>
</tr>
<tr>
<td>3271 mdl 1,11,12</td>
<td>2000</td>
<td>7820</td>
</tr>
<tr>
<td>3276</td>
<td>1200</td>
<td>3701 w 4911 &amp; 6301</td>
</tr>
<tr>
<td>1200</td>
<td>4911 or 4912 w 3701</td>
<td></td>
</tr>
<tr>
<td>3614</td>
<td>600</td>
<td>7530 w 6301</td>
</tr>
<tr>
<td>3651 mdl 25/50/75</td>
<td>600</td>
<td>7708</td>
</tr>
<tr>
<td>7001</td>
<td>600</td>
<td>6465 w 9607</td>
</tr>
<tr>
<td>1200</td>
<td>6465 w 9608</td>
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<tr>
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</table>

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**NOTES:**

1. Required for models A2, A3 and A4, or Communication Scanner Type 2 (#1642) on model A1.
2. A minimum of one Business Machine Clock (#4650) is required. See Special Features.

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3704 Communications Controller

**Terminal Feature # (a)**

- **Speed (bps)**
  - 600: 9531 to 3719
  - 1200: 9532 to 3719

**Option (4716 only)**

- 3771/3775: 1482 to 3701
- 3780: 7705 to 9122 and 9702
- 3781: 7705 to 9121 and 9704
- 3791: 1200 to 3701

**Series/1**

- 600: 2074 or 2094**2**
- 1200: 2074 or 2094**2**
- 3701: 2074 or 4800 and 4703
- 3704: 2074 or 4800 and 4703
- 3719: 2074 or 4800 and 4703
- 3771: 2074 or 4800 and 4703
- 3781: 2074 or 4800 and 4703
- 3791: 2074 or 4800 and 4703
- 3792: 2074 or 4800 and 4703

**Terminal Feature # (a)**

- 5110: 1482 to 3701
- 3771: 1482 to 3701
- 3780: 1482 to 3701
- 3791: 1482 to 3701

**Communications Terminal**

- **Customer Responsibilities:** See M2700 pages, this section. Also see the 3704/3705 Programming sales manual pages for attachment capability and refer to Host Systems Programming pages for possible restrictions to any of the above attachments.

**PREREQUISITES:** The 3704 requires a control unit position on a system channel. **NOTE:** Attachment to 3704 is in 2701, 2702, 2703 Emulation Mode only.

**S/360 mld 30** (submodels E & F), 40, 50 — multiplexer channel (standard) ... see 2030, 2040, 2050.

**S/360 mld 65, 67 (in 65 mode), 75, 195 — multiplexer channel of 2870 ... see 2870.

**S/370 mld 115, 125 — Multiplexer Channel (special feature) ... see 3115, 3125.

**S/370 mlds 135 thru mld 158 — byte multiplexer channel (standard) ... see appropriate unit.

**S/370 mld 165, 168, 195 — multiplexer channel of 2870 ... see 2870.

**3031 or 3032 Processor — byte multiplexer channel (one is standard) ... see 3031 or 3032.

**3033 Processor — byte multiplexer channel (2 are standard) ... see 3033.

**4331 Processor — byte multiplexer channel (special feature) ... see 4331.

**4341 Processor — byte multiplexer channel (1 is standard) ... see 4341.

**Bibliography:** S/360 — GC20-0360, S/370 — GC20-0001

**SPECIFIC FEATURES**

- **PRICES:** Mdl | MAC/ | MLC |
  - 2 yr | Purchase | MMMC
  - A1 | $711 | $605 | $22,100 | $149
  - A2 | 777 | 661 | 23,275 | 178
  - A3 | 843 | 717 | 24,450 | 208
  - A4 | 909 | 773 | 25,625 | 238

**Plan Offering:** Plan A, Additional Use Charge Rate: 10% Metering: Base Control Unit Purchase Option: 60% Machine Group: D Per Call: 3 Useful Life Category: 2 Upper Limit Percent: 0% Model/Feature Additional Charge in lieu of AU Charge: 10% Termination Charge Months: 5 Termination Charge Percent: 25%

**Model Changes:** Field installable.

**MODEL UPGRADE PURCHASE PRICES** (there are no additional installation charges)

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**SPECIAL FEATURES**

- **Model downgrade.**

**SPECIAL FEATURES**

- **EXTRA FEATURES:** Required for models A2, A3 or A4 or Communication Scanner Type 2 (#1642) on model A1.

**Maximum:** One. Field Installation: Yes.

**CHANNEL ATTACHMENT FEATURES**

**CHANNEL ADAPTER, TYPE 1 (#1541).** For communication with a S/360, S/370 or 4300 byte multiplexer channel. All such communications are accomplished by one, two, or three byte transfers, with deselection and reselection between each transfer. Data transfer rates are primarily dependent upon the 3704's internal processing requirements. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with Remote Program Loader (#6260).

**TWO CHANNEL SWITCH (#9002).** To attach Channel Adapter, Type 1 (#1541) to two S/360, S/370 or 4300 channels, which may be on the same CPU or on two different CPUs. The Channel Adapter so equipped will, however, be capable of operation on only one channel at a time. Selection of which channel is to be operable is by means of a manual switch on the control panel. Maximum: One. Field Installation: Yes. **Prerequisite:** Channel Adapter, Type 1 (#1541).

**COMMUNICATION SCANNER FEATURES**

**COMMUNICATION SCANNER, TYPE 1 (#1641).** The interface between the communication line attachment features and the central control unit. #1641 uses the 3704 interrupt facilities to allow the program to perform character assembly and disassembly, and allows for program control of line control, control character recognition, code translation and recovery functions. **Maximum:** One. Field Installation: Yes. Limitation: Cannot be installed with Communication Scanner, Type 2 (#1642). **Prerequisite:** At least one Business Machine Clock (#4650).

**COMMUNICATION SCANNER, TYPE 2 (#1642).** The interface between the communication line attachment features and the central control unit. #1642 assembles and disassembles characters automatically, provides character buffering for each line, and allows the program control of line control, control character recognition, code translation and recovery functions. The basic scanner is operational with one Line Interface Base Type A1 (#4700) only. **Maximum:** One. **Specify:** Communication Scanner Expansion (#9000) to permit installation of two LIBs of any types except LIB Type 1 (#4701). **Field Installation:** Yes. **Limitation:** Cannot be installed with Communication Scanner Type 1 (#1641). When #1642 is specified, only one LIB Type 1 (#4701) can be installed with #1642. **Prerequisites:** Expansion Feature (#3600) and at least one Business Machine Clock (#4650).

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Communication lines are attached to the 3704 through Line Interface Bases, of which there are several different types, to accommodate the various types of line terminations. Depending upon type, 3704s have one to eight Line Sets, which will allow attachment of from one to sixteen communication lines. The 3704 can house a maximum of two of these LIBs, allowing up to 32 lines to be attached. Note that the LIBs for attachment to the 3704 under discussion must be specified ... see "LIB Position Designators." At end of this section.

**LINE INTERFACE BASE, TYPE 1 (#4701).** For attachment of up to two of Line Sets Types A, G, F, 10, 1, 1E, 1F or 1H, in any combination. In lieu of one of these eight Line Sets, ONE of the following can be attached to this LIB:

1. **Modem Attachment Base (#5101)** with up to two of Line Sets 1L or 1M, or one of each.
2. **Modem Attachment Base with Auto Answer (#5102)** with up to two of Line Set 1P.
3. **One Line Set Type 1X (#4754)** or 1Y (#4755) ... see Duplex Data Attachment Base (#3500).
4. **One Line Set 1Q (#4771)** ... Note: This Line Set is installed in lieu of two of the eight Line Sets.

**Maximum:** Two with Communication Scanner, Type 1 (#1641)

**Prerequisites:** Communication Scanner Type 1 (#4701), Line Interface Base Type 2 (#4702), or one of the following communicators:

- Type A1
- Type 1B
- Type 1C
- Type 1F
- Type 1G
- Type 1J
- Type 1K
- Type 1L
- Type 1M
- Type 1N
- Type 1P
- Type 1Q
- Type 1R
- Type 1S
- Type 1T
- Type 1U
- Type 1V
- Type 1W
- Type 1X
- Type 1Y
- Type 1Z

**FIELD INSTALLATION:** Yes. Limitation: When installed in combination with other type LIBs, the above maximums apply to the TOTAL number of Line Sets per LIB. Prerequisites: Line Interface Base Type 1 (#4701) or Type A1 (#4700), plus a Business Machine Clock(s) (#4650), assigned by the program to this Line Set.

**LINE SET, TYPE 1B (#4712).** [Low Speed Duplex External Modem] Provides for attachment of one start/stop duplex communication line which has an X25/32C interface at speeds up to 1200 bps. This Line Set effectively combines two 3704 communication lines into a true full-duplex data port. Maximum: Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). Limitations: Not program supported. When installed in conjunction with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. Prerequisites: Line Interface Base Type 1 (#4701) or Type A1 (#4700), plus a Business Machine Clock(s) (#4650) assigned by the program to this Line Set.

**LINE SET, TYPE 1C (#4713).** [Low Speed Local Attachment] For attachment of two start/stop communication lines at speeds up to 1200 bps via IBM provided cables. Modems are not required. Note: The attached terminal must provide a Business Machine Clock and external modem cable to which the Line Set 1C cable will connect. Total cable length must not exceed 200 feet. Maximum: Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). Limitations: Not program supported. When installed in conjunction with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. Prerequisites: Line Interface Base Type 1 (#4701) or Type A1 (#4700), plus a Business Machine Clock(s) (#4650), specified for the same speed as the terminal's clock.

**LINE SET, TYPE 1D (#4714).** [Medium Speed External Line Interface] For attachment of two start/stop or synchronous communication lines at speeds up to 9600 bps, each of which has an X25/32C interface for attachment to an external modem. Maximum: Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). Limitations: Not program supported. When installed in combination with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. Prerequisites: Line Interface Base Type 1 (#4701) or Type A1 (#4700).

**LINE SET, TYPE 1F (#4716).** [Medium Speed Local Attachment] For local attachment of two half-duplex, synchronous IBM terminals at speeds up to 2400 bps via IBM-provided cables. Modems are not required. This Line Set requires different cable groups depending upon terminal type. For cabling information see Installation Manual - Physical Planning, GC22-7004; for remote, see Multimakers, GA27-3006. Note: The attached terminal must be equipped with a Business Machine Clock and must provide a standard external cable to which the 3704 Line Set Type 1F external cable will connect. Length must not exceed 100 feet. Maximum: Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). Field Installation: Yes. Limitation: When installed in combination with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. Prerequisites: Line Interface Base Type 1 (#4701) or Type A1 (#4700).

**LINE SET, TYPE 1H (#4718).** [Medium Speed Duplex External Modem] For attachment of one duplex synchronous communication line at a speed up to 9600 bps which has an X25/32C interface for attachment to an external modem. This Line Set provides for the transmission of data simultaneously in a transmit and receive mode. Maximum: Eight per LIB Type 1 (#4701) or four per LIB Type A1 (#4700). Field Installation: Yes. Limitation: When installed in combination with other type Line Sets, the above maximums apply to the TOTAL number of Line Sets per LIB. Prerequisites: Line Interface Base Type 1 (#4701) or Type A1 (#4700). For speed in excess of 4800 bps, see Address Substitution and Scan Limits under "Specify."
MODEM ATTACHMENT BASE WITH AUTO ANSWER - 2400 BPS (#5102).
For attachment of up to two of Line Set Type 1P. Maximum: Two. Field Installation: Yes. Prerequisite: Line Interface Base Type 2 (#4701) or Type A1 (#5101).

LINE SET, TYPE 1P (#4761). [IBM 2400 bps Switched Network, Integrated Modem] For attachment of one synchronous switched line at speeds of 2400 or 1200 bps. Used for operation over the Public Switched Network via Common Carrier Data Coupler Type CBS (or equivalent). Automatic answering of incoming calls will be performed by the modem. Automatic equalization is effected at the beginning of each call. This modem communicates with either an IBM 2400/1200 bps Integrated Modem or the 3872 Modem equipped with a Switched Network feature, ... no external modem is required. Maximum: Two. Field Installation: Yes. Prerequisite: Line Interface Base Type 1 (#4701) or Type A1 (#5101).

LINE SET, TYPE 1Q (#4771). [IBM 2400 bps Switched Network Integrated Modem with Automatic Call Originate] For attachment of one switched line at speeds of 2400 or 1200 bps. This Line Set includes IBM 2400 bps Integrated Modem equipped with Auto-Answer and Automatic Call Originate functions. It is suitable for dialing automatically an incoming call, and is capable of communicating over the Public Switched Network with either an IBM 2400/1200 bps Integrated Modem or the 3872 Modem equipped with either the Switched Network feature or Automatic Call Originate feature ... (the answering modem must be equipped with an auto-answer capability) The modem provides a call on-hook/off-hook control to the Common Carrier Data Coupler Type CBS (or equivalent) to dial telephone numbers and to provide on-hook/off-hook control. No external modem is required. Maximum: Three. Field Application: Yes. Prerequisites: Line Interface Base Type 1 (#4701). Limitation: Can only be used with a Rotary Dial System. Cannot be installed with Line Set Type 1P. Installation: Yes. Prerequisite: Line Interface Base Type 1 (#4701) or Type A1 (#4700).

DUPLEX DATA ATTACHMENT BASE - 2400 BPS (#3500).
For attachment of up to two of Line Set Type 1X or 1Y in any combination. Maximum: One. Field Installation: Yes. Limitations: Cannot be installed with any of the following: Line Set Type 1Q (#4771), Modem Attachment Base - 2400 bps (#5101), Modem Attachment Base with Auto Answer - 2400 bps (#5102), or Remote Program Loader (#5826).
Prerequisite: Line Interface Base Type 1 (#4701) or Type A1 (#4700).

LINE SET, TYPE 1X (#4754). [IBM 2400 bps Leased Point-to-Point Duplex Data Integrated Modem] For attachment of one Duplex synchronous leased line at speeds of 2400 or 1200 bps. This Line Set includes IBM 2400/1200 bps Leased Line Integrated Modem with Equalization suitable for leased duplex point-to-point operation... no external modem is required. This integrated modem must talk to a 2400 bps IBM 3872 or equivalent IBM modem. Maximum: Two. Field Installation: Yes. Limitation: When installed in combination with Line Set Type 1Y, the maximum of two applies to the TOTAL number of Line Sets.
Prerequisite: Duplex Data Attachment Base - 2400 bps (#3500).

LINE SET, TYPE 1Y (#4755). [IBM 2400 bps Multi-Point Master Duplex Data Integrated Modem] For attachment of one duplex synchronous leased line at speeds of 2400 or 1200 bps. This Line Set includes IBM 2400/1200 bps Leased Line Integrated Modem with equalization suitable for leased duplex multi-point master operation... no external modem is required. This integrated modem must talk to a 2400 bps IBM 3872 or equivalent IBM modem. Maximum: Two. Field Installation: Yes. Limitation: When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. Prerequisites: Line Interface Base Type 1 (#4701), or Type 2 (#5102) with Communication Scanner Expansion (#9090).

LINE INTERFACE BASE, TYPE 2 (#4702). For attachment of up to four Line Sets Type 2A (#4721). Maximum: Two. Field Installation: Yes. Limitation: When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. Prerequisites: Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

LINE SET, TYPE 2A (#4721). [Telegraph Single Current] For attachment of two single current telegraph lines, each of which may be wired for 20 ma, 40 ma or 62.5 ma single current termination. Maximum: Two per LIB Type 2 (#4702). Field Installation: No. Prerequisites: Line Interface Base Type 2 (#4702) and a Business Machine Clock(s), (#4650), assigned by the program to this Line Set.

LINE INTERFACE BASE, TYPE 3 (#4703). For attachment of up to three Line Sets Type 3A or 3B in any combination. Maximum: Two. Field Installation: Yes. Limitation: When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. Prerequisites: Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

LINE SET, TYPE 3A (#4731). [Limited Distance Type 1 Line Adapter, 2-wire] For attachment of two half-duplex, start/stop lines at speeds up to 134.5 bps. Includes two IBM 2400/1200 bps Integrated Modem 1 (2-wire) Line Adapters and no external modems are required. Note: Total wire length of each line may not exceed 4.75 wire-miles ... see SRL GA24-3435* for more information on this Line Adapter. Maximum: Three per LIB Type 3. Field Installation: Yes. Limitation: When installed in combination with Line Set(s) Type 3A, the maximum of three applies to the TOTAL number of Line Sets per LIB. Prerequisites: Line Interface Base Type 3 (#4703) and a Business Machine Clock(s), (#4650), assigned by the program to this Line Set.

LINE SET, TYPE 3B (#4732). [Limited Distance Type 1 Line Adapter, 4-wire] For attachment of two start/stop lines at speeds up to 134.5 bps. Includes IBM 2400 Limited Distance Type 1 (4-wire) Line Adapters and no external modems are required. Note: Total wire length of each line may not exceed 4.75 wire-miles ... see SRL GA24-3435* for more information on this Line Adapter. Maximum: Three per LIB Type 3. Field Installation: Yes. Limitation: When installed in combination with other LiBs, the maximum of two applies to the TOTAL number of LIBs. Prerequisites: Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

LINE SET, TYPE 4A (#4741). [Limited Distance Type 2 Line Adapter] For attachment of two half-duplex start/stop lines at speeds up to 600 bps. Includes two IBM Limited Distance Type 2 Line Adapters and no external modems are required. Note: Total wire length of each line may not exceed 8.25 wire-miles ... see SRL GA24-3435* for more information on this Line Adapter. Maximum: One per LIB Type 4. Field Installation: Yes. Prerequisites: Line Interface Base Type 4 (#4704) and a Business Machine Clock(s), assigned by the program to this Line Set.

LINE SET, TYPE 4B (#4742). [Leased Line, Line Adapter, 2-wire] For attachment of two half-duplex, start/stop lines at speeds up to 600 bps. Includes two IBM Leased Line, 2-wire Line Adapters and no external modems are required ... see SRL GA24-3435* for more information on this Line Adapter. Maximum: One per LIB Type 4. Field Installation: Yes. Prerequisites: Line Interface Base Type 4 (#4704) and a Business Machine Clock(s), (#4650), assigned by the program to this Line Set.

LINE SET, TYPE 4C (#4743). [Leased Line, Line Adapter, 4-wire] For attachment of two start/stop lines at speeds up to 600 bps. Includes two IBM Leased Line, 4-wire Line Adapters and no external modems are required ... see SRL GA24-3435* for more information on this Line Adapter. Maximum: One per LIB Type 4. Field Installation: Yes. Prerequisites: Line Interface Base Type 4 (#4704) and a Business Machine Clock(s), (#4650), assigned by the program to this Line Set.

LINE INTERFACE BASE TYPE 8 (#4708). For attachment of up to two Modem Attachment Bases - 1200 bps (#5103). Maximum: Two. Field Installation: Yes. Limitation: When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. Prerequisite: Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

MODEM ATTACHMENT BASE - 1200 BPS (#5103).
For attachment of up to two of Line Sets Type 8A, 8B, 8C or 8D in any combination. Maximum: Two per LIB Type 8 (#4708). Field Installation: Yes. Prerequisite: Line Interface Base Type 8 (#4708).

LINE SET, TYPE 8A (#4781). [IBM 1200 bps Leased Integrated Modem] For attachment of one start/stop or synchronous non-switched line at speeds up to 600 or 1200 bps. This Line Set includes one IBM 1200 bps Integrated Modem ... no external modem is required. This integrated modem must communicate with another IBM 1200 bps Integrated Modem. Maximum: Two per Modem Attachment Base - 1200 bps (#5103). Field Installation: Yes. Limitation: When installed in combination with Line Set Type 8B, the maximum of two applies to the TOTAL number of lines per

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* SRL GA24-3435-2 or later revision.
Modem Attachment Base (#5103). Prerequisites: Modem Attachment Base - 1200 bps (#5103) and a Business Machine Clock (#4650) assigned by the program to this Line Set.

LINE SET, TYPE 8B (#4782). [IBM 1200 bps Switched Integrated Modem] For attachment of one start/stop switched line at speeds up to 600 bps or one synchronous switched line at speeds of 1200 bps. This feature is to be used in conjunction with the Public Switched Network via the Common Carrier Data Coupler CBS (or equivalent). This Line Set includes one IBM 1200 bps switched Line Set. A Modified Automatic Answering capability. No external modem is required. This integrated modem must communicate with another IBM 1200 bps Integrated Modem. Maximum: Two per Modem Attachment Base - 1200 bps (#5103).

Prerequisites: Modem Attachment Base - 1200 bps (#5103) and a Business Machine Clock (#4650) assigned by the program to this Line Set.

LINE SET, TYPE 8C (#4785). [IBM 1200 bps Leased Integrated Modem with a Bi-directional Interrupt Signal] This Line Set provides for communicating with an IBM 3767 Terminal operating in 27x4 Control at a line speed of 300 bps using two wire common carrier facilities. The customer must specify the “No Echo Suppression” option from the common carrier. In addition to the above capability, this Line Set has the same functional capabilities as Line Set Type 8A (#4781) except that Line Set Type 8C is restricted to common carrier two-wire facilities. This Line Set includes one IBM 1200 bps Leased Integrated Modem. No external modem is required. This integrated modem must communicate with another IBM 1200 bps integrated modem. Maximum: Two per Modem Attachment Base - 1200 bps (#5103). Field Installation: Yes. Limitation: When installed in conjunction with Line Set Type 8A, 8B or 8D, the maximum of two applies to the TOTAL number of Line Sets per Modem Attachment Base (#5103). Prerequisites: Modem Attachment Base - 1200 bps (#5103) and a Business Machine Clock (#4650) for each speed of operation by the program.

LINE SET, TYPE 8D (#4786). [IBM 1200 bps Switched Integrated Modem with a Bi-directional Interrupt Signal] This Line Set provides for communicating with an IBM 3767 Terminal operating in 27x4 Control at a speed of 300 bps using common carrier switched facilities. In addition to the above capability, this Line Set has the same capabilities as Line Set Type 8A (#4782). This Line Set includes one IBM 1200 bps Switched Integrated Modem ... no external modem is required. This integrated modem must communicate with another IBM 1200 bps integrated modem. Maximum: Two per Modem Attachment Base - 1200 bps (#5103). Field Installation: Yes. Limitation: When installed in conjunction with Line Set Type 8A, 8B or 8C, the maximum of two applies to the TOTAL number of Line Sets per Modem Attachment Base (#5103). Prerequisites: Modem Attachment Base - 1200 bps (#5103) and a Business Machine Clock (#4650) for each operational speed for this Line Set. The operational speed is selected by the program. Note: This Line Set only has Duplex data transmission capability.

LINE INTERFACE BASE TYPE 9 (#4709). [IBM 1200 bps Switched Integrated Modem] For attachment of one synchronous speed line at speeds up to 1200 bps. This Line Interface Base includes a Line Set and one IBM 1200 bps Switched Integrated Modem equipped with Automatic Answering and Automatic Call Completion functions ... no external modem is required. This feature is to be used in conjunction with the Public Switched Network via the Common Carrier Data Coupler CBS (or equivalent). This integrated modem must communicate with another IBM 1200 bps integrated modem. Maximum: Two. Field Installation: Yes. Limitations: When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. Prerequisites: Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090), plus a Business Machine Clock (#4650) assigned by the program to the Line Set of this LIB.

LINE INTERFACE BASE TYPE 10 (#5000). For attachment of up to three of Line Set Type 10A (#4784). Maximum: Two. Field Installation: Yes. Limitation: When installed in combination with other type LIBs, the maximum of two applies to the TOTAL number of LIBs. Prerequisites: Communication Scanner Type 1 (#1641), or Type 2 (#1642) with Communication Scanner Expansion (#9090).

LINE SET, TYPE 10A (#4784). [IBM 1200 bps Leased Duplex Integrated Modem] For attachment of one Duplex synchronous leased line at speeds up to 1200 bps. This Line Set includes one IBM 1200 bps Duplex Integrated Modem ... no external modem is required. This integrated modem must communicate with another IBM 1200 bps integrated modem. Maximum: Three per Line Interface Base Type 10 (#5000). Field Installation: Yes. Prerequisites: Line Interface Base Type 10 (#5000) and a Business Machine Clock (#4650) assigned by the program to this Line Set.

BUSINESS MACHINE CLOCK (#4650). Provides clocking when the attached external modem or internal IBM Line Adapter does not provide this clocking. Maximum: Four per Communication Scanner Type 1 (#1641) or Type 2 (#1642). Field Installation: Yes. Limitation: Required only when modem does not provide clocking, except that each Communication Scanner requires at least one clock which must be at a speed less than one-half that of the lowest speed modem clocked line. Note: Each Business Machine Clock may be assigned by the program to one or more communication lines. Prerequisite: Communication Scanner Type 1 (#1641) or Type 2 (#1642).

The speed of clocking must be specified for each #4650 as follows: These can be changed in the field.

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<th>Speed (bps)</th>
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<td>#9606</td>
<td>2400.0</td>
<td>#9610</td>
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</table>

* Supported for 2740 ml2 type control only.

UNIT PROTECTION (#8510). Provides a lock on the 3704 which deactivates all switches (except power off and power on) when key is removed. Two keys are included. For additional or replacement keys, see “Locks and Keys” on M 10000 pages. Maximum: One. Field Installation: Yes.

REMOTE OPERATION EXTENDED ENVIRONMENT (#3620). [Mdl A3 or A4 only] Provides cooling such that a 3704 with Remote Program Loader (#6265) can operate in a Class C Environment with a temperature range of 50° C ~ 100° C. Maximum: One. Field Installation: Yes. Prerequisite: Remote Program Loader (#6260).

REMOTE POWER OFF (#6250). [Mdl A3 or A4 only] Provides the capability of turning the 3704’s power off with a command over a communications line. Maximum: One. Field Installation: Yes.

REMOTE PROGRAM LOADER (#6260). [Mdl A3 or A4 only] Provides the means of loading the NCP Program into the 3704 when there is no Channel Adapter on the machine. This feature also provides for diagnosing the communications controller without the aid of the CPU. Maximum: One. Field Installation: Yes. Limitations: Cannot be installed with any of the following: Channel Adapter Type 1 (#1641), Duplex Data Attachment Base - 1200 bps (#3500), Modem Attachment Base - 2400 bps (#5101).

LIB POSITION DESIGNATORS

The position of the Line Interface Bases within the 3704 must be specified in accordance with the following table.

<table>
<thead>
<tr>
<th>Communication Scanner Type 1 (#1641)</th>
<th>Communication Scanner Type 2 (#1642)</th>
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<tr>
<td>LIB Type Position 1</td>
<td>Position 2</td>
</tr>
<tr>
<td>A1</td>
<td>--</td>
</tr>
<tr>
<td>1</td>
<td>#9311</td>
</tr>
<tr>
<td>2</td>
<td>#9321</td>
</tr>
<tr>
<td>3</td>
<td>#9331</td>
</tr>
<tr>
<td>4</td>
<td>#9341</td>
</tr>
<tr>
<td>5</td>
<td>#9351</td>
</tr>
<tr>
<td>6</td>
<td>#9361</td>
</tr>
<tr>
<td>7</td>
<td>#9371</td>
</tr>
<tr>
<td>8</td>
<td>#9381</td>
</tr>
<tr>
<td>9</td>
<td>#9391</td>
</tr>
<tr>
<td>10</td>
<td>#9401</td>
</tr>
</tbody>
</table>

The LIBs must be assigned to position in numerical order, that is, LIB Type A1s must be assigned to the lowest numbered positions, LIB Type 1 is next lowest, etc., so that the highest type-numbered LIB is in the highest numbered position. Each order submitted must indicate the Feature # for each LIB desired plus a location specify code (position number, from above table) based on the LIB Type.

The positions of the LIB Sets within the LIBs will be automatically assigned.
<table>
<thead>
<tr>
<th>SPECIAL FEATURE PRICES:</th>
<th>MAC/ MLC</th>
<th>ETP/ MRC</th>
<th>2 yr</th>
<th>Purchase MMMC</th>
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</thead>
<tbody>
<tr>
<td>Business Machine Clk #4650</td>
<td>$12  $10</td>
<td>$408</td>
<td>$1.00</td>
<td></td>
</tr>
<tr>
<td>Comm Scanner Type 1 1641</td>
<td>25 21</td>
<td>816</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>Comm Scanner Type 2 1642</td>
<td>129 110</td>
<td>4,080</td>
<td>5.50</td>
<td></td>
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<tr>
<td>Expansion Feature 3600 12 10</td>
<td>408</td>
<td>.50</td>
<td></td>
<td></td>
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<tr>
<td>Extended Environment 3620</td>
<td>25 21</td>
<td>816</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 1 4701</td>
<td>25 21</td>
<td>816</td>
<td>1.50</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1A 4711</td>
<td>36 31</td>
<td>1,235</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1B 4712</td>
<td>36 31</td>
<td>1,235</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1C 4713</td>
<td>36 31</td>
<td>1,235</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1D 4714</td>
<td>103 88</td>
<td>3,275</td>
<td>8.50</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1E 4715</td>
<td>63 54</td>
<td>2,040</td>
<td>3.00</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1F 4716</td>
<td>103 88</td>
<td>3,275</td>
<td>8.50</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1H 4718</td>
<td>109 93</td>
<td>3,485</td>
<td>15.50</td>
<td></td>
</tr>
<tr>
<td>Modem Att Base</td>
<td>2400 bps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1L</td>
<td>109 93</td>
<td>3,485</td>
<td>3.50</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1M</td>
<td>4751</td>
<td>63 54</td>
<td>2,040</td>
<td>12.00</td>
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<tr>
<td>Modem Att Base AA</td>
<td>2400 bps</td>
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<td></td>
<td></td>
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<tr>
<td>Line Set Type 1P</td>
<td>4761</td>
<td>69 59</td>
<td>2,255</td>
<td>17.50</td>
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<tr>
<td>Line Set Type 1Q</td>
<td>4771</td>
<td>303 258</td>
<td>9,350</td>
<td>25.50</td>
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<tr>
<td>Duplex Data Att Base</td>
<td>2400 bps</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Line Set Type 1X</td>
<td>4754</td>
<td>103 88</td>
<td>3,275</td>
<td>16.50</td>
</tr>
<tr>
<td>Line Set Type 1Y</td>
<td>4755</td>
<td>96 82</td>
<td>3,060</td>
<td>14.00</td>
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<tr>
<td>Line Inter Base Typ A1 4700</td>
<td>25 21</td>
<td>816</td>
<td>1.50</td>
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</tr>
<tr>
<td>Line Inter Base Typ 1G 4717</td>
<td>83 71</td>
<td>2,635</td>
<td>9.50</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 1J 4719</td>
<td>89 76</td>
<td>2,850</td>
<td>3.50</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 2 4702</td>
<td>25 21</td>
<td>816</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 2A 4721</td>
<td>63 54</td>
<td>2,040</td>
<td>5.50</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 3 4703</td>
<td>78 66</td>
<td>2,485</td>
<td>3.50</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 3A 4731</td>
<td>49 42</td>
<td>1,660</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 3B 4732</td>
<td>49 42</td>
<td>1,660</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 3C 4734</td>
<td>49 42</td>
<td>1,660</td>
<td>2.00</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 3D 4741</td>
<td>89 76</td>
<td>2,850</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 3E 4742</td>
<td>89 76</td>
<td>2,850</td>
<td>5.00</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 3F 4743</td>
<td>89 76</td>
<td>2,850</td>
<td>7.50</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 3G 4708</td>
<td>78 66</td>
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<td>2.00</td>
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</tr>
<tr>
<td>Modem Att Base</td>
<td>1200 bps</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line Set Type 8A 4781</td>
<td>19 16</td>
<td>630</td>
<td>4.00</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 8B 4782</td>
<td>25 21</td>
<td>840</td>
<td>6.00</td>
<td></td>
</tr>
<tr>
<td>Line Set Type 8C 4785</td>
<td>54 46</td>
<td>1,005</td>
<td>17.50</td>
<td></td>
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<tr>
<td>Line Set Type 8D 4786</td>
<td>60 51</td>
<td>1,120</td>
<td>19.50</td>
<td></td>
</tr>
<tr>
<td>Line Inter Base Typ 9 4709</td>
<td>180 153</td>
<td>5,695</td>
<td>10.50</td>
<td></td>
</tr>
<tr>
<td>Remote Power Off 6250 12 10</td>
<td>408</td>
<td>.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remote Power Off 6260 194 165</td>
<td>6,120</td>
<td>38.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two Channel Switch 8602 25 21</td>
<td>408</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit Protection 8510 35SUC</td>
<td>35</td>
<td>NC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

† Also available with Line Interface Base Type A1 (#4700).
IBM 3705 COMMUNICATIONS CONTROLLER

Purpose: The 3705-I and 3705-II attach to all S/370 or 4300 Processors, or in 2701/2702/2703 Emulation Mode only, to a S/360 mdl 30 (submodels E or F) (3705-I only), 40, 50, 65, 67 (in 65 mode), 75 and 195 for communication with local or remote I/O devices over various common carrier provided or customer owned communication facilities. NOTE: See "Programming" and "SCP" sales manual pages for attachment capability.

Highlights: A modular, programmable unit which expands the communications capabilities of S/360, S/370 or 4300 Processors. By virtue of its modularity and programmability, the 3705 boasts a high degree of flexibility in tailoring to a teleprocessing system's requirements. Also it can relieve the CPU of many TP functions, including, but not limited to, line control, polling, addressing, code translation and error recovery. The maximum number of communication lines which can be physically attached to a 3705 is 352 lines; but, the maximum number of communication lines capable of concurrent operation is a function of the speed of the lines, the type of Channel Adapter, memory size, and Communication Scanner installed and the programming mode of operation. The maximum number of lines which can be physically installed can exceed the operational capability, see "Specify" for "special scheduled" systems. The 3705-I has a 1.2 microsecond memory cycle time ... the 3705-II models E, F, G and H have a 1.0 microsecond memory cycle time ... the 3705-II models J, K and L have a 0.9 nanosecond memory cycle time.

Communications Facilities: The 3705 operates over common carrier provided or equivalent customer owned communications facilities. For information concerning these facilities, see the M 2700 pages, this section.

Customer Responsibilities: See M 2700 pages, this section. Also see 3704/3705 "Programming" sales manual pages for attachment capability and refer to Host Systems Programming manuals for possible restrictions to the above attachments.

3705 LOCAL ATTACHMENT (START/STOP)

In addition to terminals being attached to the 3705 through common carrier facilities, they may also be connected directly to the 3705 units using #4713. Below are the attachable terminals and the respective feature #s. Cable groups may be traced via this feature # listing and the feature #s listed in the respective Physical Planning Manuals. Ensure that the cable groups selected from the Physical Planning Manuals have the 25 pin data set interface. #4713 allows only two terminals to be attached, one per 3705 25 pin data set interface. There must be corresponding Business Machine Clocks in both the terminal and the 3705.

Terminal Speed (bps) Terminal Feature #(s)  
1031A/1034  600 2068  
1061  134.5 9115 or 9120  
2740 mdl 1  134.5 9115 or 9120  
2740 mdl 2  134.5 9115 or 9120  
2741  600 7106 w 9121  
2845/2848  1200 9012  
3767 (attaches via Line Set 1F)  300 7111 or 7113 w 9540 and 3719  
5010 (S/7)  134.5 1610 w 2165  
5100/5110  134.5 1525 300 1525

3705 LOCAL ATTACHMENT (SYNCHRONOUS)

In addition to the synchronous terminals being attached to the 3705 through common carrier facilities, they may also be connected directly to the 3705 units using #4713. Below are the attachable terminals and the respective feature #s. Cable groups may be traced via the feature #s given below and the feature #s listed in the respective Physical Planning Manuals. Ensure that the cable groups selected from the Physical Planning Manuals have the 25 pin data set interface. #4716 allows only two terminals to be attached, one per 3705 25 pin data set interface. There must be corresponding Business Machine Clocks in both the terminal and the 3705.

Terminal Speed (bps) Terminal Feature #  
1131  600 7690  
1200 7690  
2000 7690  
2400 7690  
1826  1200 7551 w 7552  
2000 7551 w 7552  
2400 7551 w 7552  
2020  1200 2074 w 4703  
2400 2074 w 4703  
2025  1200 7551 w 7641  
2701  600 7698 w 7401  
1200 7698 w 7692  
2400 7698 w 7693  
2703  1200 7705 w 7710  
2715 mdl 2  1200 7705  
2722  1200 7705 w 9122  
2780  1200 7705 w 9110  
3115  600 7141  
1200 7141  
3125  600 7141  
3135/3138  1200 4640 w 9649  
1200 4640 w 9649  
4331  600 See Communications Adapter  
1200 (S/34) on 4331 for details and prerequisites.  
3721 mdl 1,2,11,12  1200 7820  
3725 mdl 1,2,11,12  1200 7820  
3726  1200 3701 w 9491 and 6301  
3601/3602  1200 4501 or 6301 w 3701  
3614  1200 3701 w 6301  
3651 mdl 25/50/75  2400 7708  
3704/3705  600 4714 and 4650 w 9607  
1200 4714 and 4650 w 9608  
2000 4714 and 4650 w 9609  
2400 4714 and 4650 w 9610  
3735  1200 7705 w 50101  
3741  1200 7705 w 9122  
3747  1200 7705 w 9122  
3767 (attaches via Line Set 6)  1200 9651 w 3719  
Set 1F (#4716 only)  1200 9512 w 3719  
3771/3773/3774/  
3775  1200 1482 w 3701  
3780  1200 7705 w 9122 and 9702  
2400 7705 w 9121 and 9704  
3791  1200 3701 w 6301  
Series/1  600 2074** or 2094**  
5010 (S/7)  1200 2074** or 2084**  
2400 2074 w 4800 and 4703  
2000 2074 w 4800 and 4703  
2400 2074 w 4800 and 4703  
5110 (2772)  1200 2074 w 3701  
2400 2074 w 4750 and 9334 and 9751  
5230 (S/32)  600 2074 w 3701 and 4703  
1200 2074 w 3701 and 4703  
2400 2074 w 3701 and 4703  
5340 (S/34)  600 2074 w 3701 and 4703  
1200 2074 w 3701 and 4703  
2400 2074 w 3701 and 4703  
5404/6/8/10/12/15  600 2074 w 4703 and 9750 and 9481 and 2838  
1200 2074 w 4703 and 9751 and 9481 and 2838  
2000 2074 w 4703 and 9752 and 9481 and 2838  
2400 2074 w 4703 and 9753 and 9481 and 2838

** Series/1 communication feature must have internal clock jumper installed.

3705 LOCAL ATTACHMENT (V35)

The following terminals may be attached locally to the 3705 using Line Set 1W (#4727) (Half Duplex) or Line Set 1Z (#4728) (Full Duplex) V35 interfaces. Cable groups may be traced via the feature numbers given below and the feature numbers listed in the respective Physical Planning manuals. No business machine clock is required in the attached device since clocking signals are provided by Business Machine Clock (#4651) in combination with #4727 and #4728

#4727 Half Duplex

Terminal Speed (bps) Terminal Feature #  
3705  14,400 4720  
57,600 4720  
3776-3, 3776-4  14,400 4720  
3777-1, 3777-2, 3777-3  14,400 4720

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3705 Communications Controller (cont'd)  
#4728 Full Duplex

### Terminal Speed (bps) Terminal Feature #
3705 14,400 4726
3776-3, 4 57,600 4726
3777-3 14,400 4720

### Machine Organization:
The basic machine consists of the Central Control Unit (CCU) with storage (16K in the 3705-I and 32K in the 3705-II) and an operator's control panel. A minimum machine configuration must have in addition, to the basic unit, the following features:

1. Either a Channel Adapter (CA) feature or the Remote Program Loader feature. The Channel Adapters have different levels of design providing various degrees of programming overhead in channel operation.
2. A Communication Scanner (CS) feature to provide for the connection between the Attachment Base feature and the Line Interface Base(s) features. Like the Channel Adapters the various Communication Scanners have varying degrees of performance.
3. An Attachment Base which provides a common connection between the Communication Scanner(s) and the Central Control Unit (CCU).
4. A Line Interface Base (LIB) which provides the connection between the CS and the various Line Sets. The LIB provides the hardware for the mounting of the individual Line Sets. Each LIB is designed for a certain set of functions in conjunction with the various Line Sets.
5. A Line Set (LS) which provides the electronics and external cables to interface to a communication facility. NOTE: Both the external cables and the Line Sets are individually ordered through the AAS system. The number of Line Sets that can be contained in a LIB is contingent upon the electronic hardware of a Line Set required to perform the functions supporting the communications facilities.
6. A Business Machine Clock which provides clocking of data in and out of the Communication Scanner.

### Models:
The 3705 consists of two versions, with various models based on either the number of frames and/or the storage capacity.

#### 3705-I
- Consists of core storage with a cycle time of 1.2 microseconds.
- Consists of monolithic storage with a cycle time of 1.0 microseconds (models E, F, G, and H) or 900 nanoseconds (models J, K, and L).

The model numbering of the 3705 is "x", "y", "z" and is an alpha code designating the number of frames in a 3705: A represents one frame, B two, C three, and D four frames for a 3705-I. E represents one frame, F or J two, G or K three, and H or L four frames for a 3705-II. "y" is a numeric code designating the storage size.

In the 3705-I, the storage is housed in each frame in quantities of one or two increments of core storage. In the 3705-II (models E, F, G, and H), the storage is housed only in the first frame, which has up to nine increments of monolithic storage. The 3705-II, models J, K, and L have 256K of storage in the first frame and 64K in the second frame. Additional storage in 64K increments may be installed in the second frame for a maximum of 512K bytes.

#### 3705-I

<table>
<thead>
<tr>
<th>Model</th>
<th>Core Storage (bytes)</th>
<th>Monolithic Storage (bytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1 - D8</td>
<td>E1 - L4</td>
<td>A1, B1, C1, D1</td>
</tr>
<tr>
<td>A2, B2, C2, D2</td>
<td>48K</td>
<td>E2, F2, G2, H2</td>
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<tr>
<td>B3, C3, D3</td>
<td>80K</td>
<td>E3, F3, G3, H3</td>
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<td>B4, C4, D4</td>
<td>112K</td>
<td>E4, F4, G4, H4</td>
</tr>
<tr>
<td>C5, D5</td>
<td>144K</td>
<td>E5, F5, G5, H5</td>
</tr>
<tr>
<td>C6, D6</td>
<td>176K</td>
<td>E6, F6, G6, H6</td>
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<tr>
<td>D7</td>
<td>208K</td>
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</tr>
<tr>
<td>D8</td>
<td>240K</td>
<td>E8, F8, G8, H8</td>
</tr>
</tbody>
</table>

### PREREQUISITES:
The 3705-I and 3705-II require a control unit position on a system channel unless only the Remote Program Loader (RPL) feature is installed. Note: Attachment to S/360 is in 2701, 2702, 2703 Emulation Mode only.

S/360 mld 30 (submodels E and F), 40, 50 -- multiplexer channel

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[2] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V. Field Installation: Yes.

[3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for grey, or #9046 for white. Field Installation: Yes.


[5] Address Substitution/Upper Limit Scan: For 3705s with a Communication Scanner, Type 2, there are two methods of address modification: Upper Scan Limits and Address Substitution, which allow the Type 2 Scanner to operate a Line Set at speeds greater than 4800 bps. For information on ULS, see the IBM 3704 and 3705 Principles of Operation, GC30-3004. Address Substitution (#9001, 9002, 9003, 9004): May be required when lines at speeds greater than 4800 bps are to be installed. An added feature requires software, and the Address Substitution capability allows multiple scanning of a Line Set's address at the expense of NOT scanning other Line Set addresses. The added feature blocks the high scanning of a Line Set in those address positions that are not scanned by address substitution. The choice of which of the four following specify features is to be ordered should be based on the number of high speed lines to be installed and their relative line set positions within the first LIB position. The lowest position (#9001) should always be specified first, followed by each succeeding number. For those positions within a LIB where Address Substitution is invoked, only the even addresses are scanned.

#9001 -- blocks installation of a Line Set in partition 8 (both 3705s) and Type 1 and Type 2 LIBs. Specify #9001 when the FIRST Line Set of the first LIB is to contain the high speed (greater than 4800 bps) line.

#9002 -- blocks installation of a Line Set in partition 7 (3705s) on all Type 1 and Type 2 LIBs. Specify #9002 when the SECOND Line Set of the first LIB is to contain the high speed (greater than 4800 bps) line.

#9003 -- blocks installation of a Line Set in partition 6 (3705s) on all Type 1, Type 2, Type 3 and Type 10 LIBs. Specify #9003 when the THIRD Line Set of the first LIB is to contain the high speed (greater than 4800 bps) line.

#9004 -- blocks installation of a Line Set in partition 5 (3705s) on all Type 1, Type 2, Type 3 and Type 10 LIBs. Specify #9004 when the FOURTH Line Set of the first LIB is to contain the high speed (greater than 4800 bps) line.

Maximum: One each of the above per 3705 Field Installation: Yes.

Note: When Address Substitution is specified, it will block Line Set installation in ALL LIBs in the 3705 and therefore, will reduce the physical line handling capability of the 3705. See IBM 3704/3705 Communications Controllers, Principles of Operations, GC30-3004, for further details. Address Substitution should not be used on a 3705 containing a Communication Scanner, Type 1 or Type 3.

High Speed Select: For the 3705 with a Communication Scanner, Type 3, there are two methods of address modification: Upper Scan Limits and High Speed Select, which allow the Type 3 Scanner to operate with Line Set speeds greater than 4800 bps. For information on ULS, see the IBM 3704 and 3705 Principles of Operations, GC30-3004. High Speed Select (#9011, 9012, 9013, 9014, 9015, 9016, 9017): May be required when lines at speeds greater than 4800 bps are to be installed. The added feature blocks the installation of a Line Set in a position whose address is not scanned. The choice of which of the eight following features is to be ordered should be based on the number of high speed lines used and their relative positions within a LIB position. On special scheduled systems where a high speed Line Set is used only a portion of the time, then the position does not have to be blocked if the Line Set positions (which have been blocked) are not used simultaneously with the high speed line. Examples of such use are for backup or load sharing purposes. For those positions within a LIB where High Speed Select is invoked, only the even addresses are scanned.

#9011 -- blocks installation of a Line Set in partition 1 of the additional LIBs within a 3705 module. Only the 3705 module containing the high speed line is affected.

#9012 -- blocks installation of a Line Set in partition 2.

#9013 -- blocks installation of a Line Set in partition 3.

#9014 -- blocks installation of a Line Set in partition 4.

#9015 -- blocks installation of a Line Set in partition 5.

#9016 -- blocks installation of a Line Set in partition 6.

#9017 -- blocks installation of a Line Set in partition 7.

#9018 -- blocks installation of a Line Set in partition 8.

Maximum: One each of the above per Communication Scanner, Type 3 (1643).

Prerequisite: Communication Scanner, Type 3 (1643).

Note: When High Speed Select is specified, it will restrict Line Set installation in all LIBs (except LIB Position 1) of the 3705 which has the scanner modification implemented. See IBM 3704/3705 Communications Controllers, Principles of Operation, GC30-3004.

[6] A Communication Cable Order must be submitted for: Each new 3705 machine order ... each order where the added feature requires external cable. For cabling information, see separate Installation Manual - Physical Planning: S/360 -- GC22-6920 ... S/370 -- GC22-7004 ... 4300 Processors -- GA27-3006. Also see Channel Adapters and Line Sets. For remote 3705-I or remote 3705-II, see Multiplexers, GA27-3006.


[9] Specify #9565 when two or more CA-4s are in the 3705-II configuration and the NCP/VS program product is installed or for EP/VS if PRP P80521 is installed with greater than one CA-4. Must be specified in every module in which CA-4 appears.

PRICES: Mdl MAC/ MRC MLC 2 yr Purchase MMC M

3705-I

A1 $1,287 $1,095 $40,800 $197
A2 1,845 1,570 58,550 239
B1 1,698 1,445 54,100 220
B2 2,282 1,925 71,850 261
B3 2,826 2,405 89,500 304
B4 3,834 2,880 107,300 345
C1 2,133 1,813 67,400 241
C2 2,691 2,280 85,150 285
C3 3,249 2,765 102,900 328
C4 3,813 3,245 120,650 369
C5 4,365 3,715 138,400 410
C6 4,923 4,190 156,150 452
D1 2,550 2,170 80,700 264
D2 3,058 2,645 98,450 306
D3 3,672 3,125 116,150 350
D4 4,236 3,605 133,950 391
D5 4,794 4,080 151,700 433
D6 5,352 4,555 169,450 475
D7 5,916 5,035 187,200 517
D8 6,474 5,510 204,950 560

3705-II

E1 1,204 1,035 38,230 250
E2 1,333 1,135 40,560 276
E3 1,462 1,245 42,930 302
E4 1,591 1355 45,280 329
E5 1,720 1,465 47,630 354
E6 1,849 1,575 49,980 380
E7 1,978 1,685 52,330 406
E8 2,107 1,795 54,680 432
F1 1,616 1,375 51,530 271

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3705 Communications Controller (cont’d)

- F2, 1,745  
- F3, 1,874  
- F4, 2,003  
- F5, 2,132  
- F6, 2,261  
- F7, 2,390  
- F8, 2,519  
- G1, 2,027  
- G2, 2,156  
- G3, 2,285  
- G4, 2,414  
- G5, 2,543  
- G6, 2,672  
- G7, 2,801  
- G8, 2,930  
- H1, 2,438  
- H2, 2,567  
- H3, 2,696  
- H4, 2,825  
- H5, 3,122  
- H6, 3,341  
- H7, 3,564  
- H8, 3,822  
- J1, 4,080  
- K1, 4,377  
- K2, 4,792  
- L1, 4,128  
- L2, 4,386  
- L3, 4,644  
- L4, 4,902

3705-11 models A, F, G to models J, K, L

- 3705-11 model F8 to J1 ..... $25,060
- 3705-11 model G8 to K1 ..... $25,060
- 3705-11 model H8 to L1 ..... $25,060

- Additional storage per 64K $4,700

### From 3705-1 models to 3705-I models

<table>
<thead>
<tr>
<th>To 3705-I Models</th>
<th>From 3705-I Models</th>
</tr>
</thead>
<tbody>
<tr>
<td>&quot;A&quot; Models</td>
<td>$16,680 + (i)</td>
</tr>
<tr>
<td>&quot;B&quot; Models</td>
<td>$16,680 + (i)</td>
</tr>
<tr>
<td>&quot;C&quot; Models</td>
<td>$16,680 + (i)</td>
</tr>
<tr>
<td>&quot;D&quot; Models</td>
<td>$16,680 + (i)</td>
</tr>
</tbody>
</table>

### Examples:
- A1 to E4 = 3 increments (E1 to E4) or $7,050 + the above price of $16,680 for a total of $23,730.
- C4 to H6 = 5 increments (H1 to H6) or $11,750 + the above price of $29,980 for a total of $41,730.

### SPECIAL FEATURES

**ATTACHMENT BASES:** The Attachment Base provides the physical and logical connection between the Channel Adapter Type 1 and the Central Control Unit and between the Central Control Unit and the various Communication Scanners. There are two Attachment Bases. A 3705 must have at least one Attachment Base and in some instances will have both Attachment Bases.

---

**CHANNEL ADAPTER:** The Channel Adapter provides the logical interface between a 3705 and a S/360, S/370 or 4300 Processor. Every 3705 must have at least one Channel Adapter in the first module (except those units having the Remote Program Loader (#6260)). Channel Adapter, Type 1 can be placed in the first frame of a 3705. When a second Channel Adapter is a Type 2 or Type 3, then ‘ROS Substitution’ must be specified on the first module (3705-I) ... specify 9754.

**Notes:** No more than one #1301 or #1302 is allowed per 3705.

**Channel Adapter, Types 2, 3 and 4 contain the Attachment Base logic within the logic of their respective features.

**Limitations and Precautions:**

1. 3705-I (first module) can contain one Channel Adapter, Type 1, 2, 3 or 4. The (second module) can contain one Channel Adapter, Type 2, 3 or 4.

2. When operating with ACF/NCP/VS the 3705-II (first module) can contain two channel adapters. The 3706 (second module) can contain two channel adapters. If two channel adapters are in one module (3705-II), at least one of the adapters must be CA-4. When operating with greater than one CA-4 and EP/VS with PRPQ P85021 is installed, then ‘N ROS Substitution’ must be specified on every module in which a CA-4 appears. Specify 9558. When ordering a Channel Adapter, use the specify to indicate total number of CAs in the 3705 and 3706 combined and place this specify on the first two frames (3705 and first 3706). If 1 CA, specify #9201 .... if 2 CAs, specify #9202 ... if 3 CAs, specify #9203 ... if 4 CAs, specify #9204 ... if 8 CAs, specify #9208.

3. No Channel Adapters are allowed in the third or fourth module.

The Channel Adapters can be mixed with the following exceptions:

4. CA 1 cannot be in a machine with either CA 4 or a Communication Scanner, Type 3, or a Communication Scanner, Type 3 High Speed.

5. When either a CA 2 or CA 3 is in the 3705 with a CA 4, the CA 4 must be in the first module.

6. Channel Adapters, Type 1 and Type 4 must be used with Emulation Mode of Operation and may be used with Network Control Mode of Operation.

7. Channel Adapters, Type 2 and Type 3 are used only with Network Control Mode of the Network Control Program.

8. Channel Adapter, Type 1 requires the Attachment Base, Type 1 as a prerequisite. Channel Adapters, Type 2, 3 and 4 contain the attachment base function within their respective features.

9. For the 3705-II, if greater than two CAs are installed, the CAs must all be CA-4s. Up to four CA-4s are allowed.

10. For the 3705-II, up to four I/O Channel Attachments are allowed (2 per frame).

11. For the 3705-II, Remote Program Load-II (#6261) can co-exist with a Channel Adapter.

12. For the 3705-II, if two CAs are in the same frame, then no Two Channel Switch (#8002) is allowed.

13. 3705-II models J, K or L must not be a CA1.

14. The Communication Scanner, Type 3 High Speed (CS-3 HS) can only be installed in a 3705-II.

---

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The placement of various RPL/CA and CA configurations is as follows:

### 3705-II

<table>
<thead>
<tr>
<th>LIB Pos. 3</th>
<th>LIB Pos. 2</th>
<th>LIB Pos. 3</th>
<th>LIB Pos. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPL/CA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(B1)</td>
<td>(B1)</td>
<td>(A1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIB Pos. 4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS-3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS-3HS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(A2)</td>
<td>(A2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CS-2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(B1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CA-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(A4)</td>
<td>(A4)</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** CS-3 and CS-3 HS take two positions.

### Allowable Hardware Channel Adapter Combinations:

<table>
<thead>
<tr>
<th>1st Type</th>
<th>2nd Type</th>
<th>3rd Type</th>
<th>4th Type</th>
<th>Module Location</th>
<th>ROS Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA-1</td>
<td>CA-4</td>
<td>CA-2</td>
<td>CA-3</td>
<td>CA-4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Available only on 3705-II.

### Definition of the different ROS types:

1. 1 - used to IPL over one channel—either a CA1 or CA4. It may be used to IPL over one or two CA4s if support programs for ACF/NCP/VS are not installed. No specification code is required for the type 1 ROS.

2. 2 - used to IPL over one channel—either a CA2 or CA3. No specification code is required for the type 2 ROS.

3. DUAL ("ROS Substitution") - used to IPL over one or two channels—using any appropriate combination shown above. Specification #9754 is required for Dual ROS.

4. N ("N POS Substitution") - used to IPL over one of 2, 3 or 4 channels (all channels must be CA4s and the support programs for ACF/NCP/VS Program Product or EP/VS with PRPQ P68021 must be installed). Specification #9566 is required for N ROS.

5. RPL - used to IPL remotely. There is a separate ROS for the 3705-I remote and the 3705-II remote. (Although remote is not mentioned on this page, it is listed here for convenience). No specification code is required for RPL ROS.

### CHANNEL ADAPTER, TYPE 1 (1#1541)

For communication with a S/360, S/370, or 4300 Processor byte multiplexer channel. All such communications are accomplished via one, two, three or four byte transfers, with deselection and reselection between each transfer. Data transfer rates are primarily dependent upon the 3705's internal processing requirements. Field Installation: Yes. Limitations, Prerequisites and Maximum: See general description above.

### CHANNEL ADAPTER, TYPE 2 (1#1542)

A high performance adapter which supports communication with a S/370 byte multiplexer or block multiplexer or selector channel, or a 4300 byte multiplexer or block multiplexer channel at data transfer rates of up to 276 kilobytes/second (limited by system channel capability). Transfer is always accomplished in 'burst' mode, with a two-byte "burst" standard on the byte multiplexer channel, and full "burst" standard on the block multiplexer and selector channels. Field Installation: Yes. Limitations, Prerequisites and Maximum: See general description above.

### CHANNEL ADAPTER, TYPE 3 (1#1543)

An adapter of the same performance characteristics as the Type 2 (1#1542) with the additional capability of an automatic two processor switch. It communicates with a virtual storage S/370 byte multiplexer, block multiplexer, or selector channel (models 115 and 125 excepted), or a 4300 byte multiplexer or block multiplexer channel. The switch, part of the basic adapter, is primarily designed to furnish symmetric support for two tightly-coupled processors; i.e., each side of the switch is connected to one of the two MP CPUs. Additionally, this adapter can be attached to two channels from one CPU to provide alternate path capability. For either tightly-coupled multiprocessor or single CPU attachments, data transfer occurs only on one path at a time. Included as standard is a remote switch attachment capability to remotely control the switch from the configuration control panel of a S/370 or an IBM 158 MP or 168 MP, as well as from the 2925 Remote Switching Console Model 10. Field Installation: Yes. Limitations, Prerequisites and Maximum: See general description above.

### CHANNEL ADAPTER, TYPE 4 (1#1544)

A channel adapter which provides attachment to a S/360 byte multiplexer channel (EP) or S/370 byte multiplexer, block multiplexer or selector channel, or 4300 byte multiplexer or block multiplexer channel. It supports either a high performance Emulator Program running with a Type 3 Communication Scanner or Type 2 Communication Scanner or a high performance Network Control Program running the same scanners and Type 3 Communication Scanner. When attached to a byte multiplexer channel, the Type 4 transfers in "bursts" of up to 32 bytes prior to interrupting the control program when running in EP mode. In ACF/NCP/VS mode, the Type 4 transfers in "bursts" up to 248 bytes and can transfer up to 248 bytes prior to interrupting the control program.

In ACF/NCP/VS mode, when attached to a S/370 block multiplexer or selector channel or 4300 block multiplexer channel, the Type 4 "bursts" up to 248 bytes and can transfer up to 248 bytes prior to interrupting the control program. When the Type 4 is supported using the ACF/NCP/VS Program Product, the channel adapter operates in a cycle steal mode (data is directly moved to or from storage, and if this is accomplished, the control program resumes its operation at the completion of this stolen cycle unless another "cycle steal" request is pending). The cycle steal operation improves the 3705's throughput when compared with NCP/VS support of CA4 by reducing the number and complexity of control program interrupts.
When attached to a byte multiplexer channel and supported by NCP/VS, the Type 4 transfers in bursts of 4 bytes per control program request. This channel adapter is necessary when using the Communications Scanner, Type 3 in Emulation Mode.

**TWO CHANNEL SWITCH (#8002)**. To attach either Channel Adapter, Type 1 (#1541) or Type 2 (#1542) or Type 4 (#1544) to two S/370 or 4300 Processor channels, which may be on the same CPU or on two different CPUs. The Channel Adapter so equipped will, however, be enabled for operation on one channel at a time. Selection of which channel is to be operable is by a manual switch on the control panel. **Prerequisite**: Channel Adapter, Type 1 (#1541), Type 2 (#1542) or Type 4 (#1544). Limitation: If two Channel Adapters are used, then no #8002 is allowed; otherwise, one #8002 per Channel Adapter.

**COMMUNICATION SCANNER FEATURES**: The Communication Scanner Features provide the common logical connection between the various Line Interface Bases with their respective Line Sets and the Central Control Unit. Each module of a 3705 must have a communication scanner if line sets are placed within the module. There are three communication scanners, each with a different merit of performance.

**Field Installation**: All communication scanners can be field installed. Limitations:

1. One Communications Scanner per module. The communication scanners Type 2 and 3 can be placed within a 3705 in any combination.
2. A Communication Scanner, Type 1 (#1641) can only be placed in the first module of a 3705-1, cannot be placed in a 3705-1.
3. A Communication Scanner, Type 1 cannot be in a 3705 with a Communication Scanner, Type 2, or Type 3.
4. Each scanner must have at least one Business Machine Clock, but not more than four Business Machine Clocks.
5. The Communication Scanner, Type 3 only supports attachment of LIBs 1, 8, 9 and 10.
6. Communication Scanner, Type 3 cannot be in the 3705 (first module of a 3705-1).
7. A Communication Scanner must be in a module containing Line Interface Base(s).
8. A Communication Scanner, Type 1 (#1641) cannot be installed with the NCP/VS Program Product.
9. Communication Scanner, Type 3, may have a Business Machine Clock, specify #9615, and may have one other clock (specify #9610).
10. **Communication Scanner, Type 3 High Speed, must have Business Machine Clock (#4650)**. Specify #9615; no other clock is allowed.

**Communication Scanner, Type 1 (#1641)**. This feature has a lower performance capability than the other scanners due to a higher processing overhead requirement of data between storage and the line sets on a bit by bit basis. The scanner interrupts the control program at each bit time so that the control program can perform character assembly and disassembly and also allows for program control of line control, character recognition, code translation and error recovery functions. No line speed over 7200 bps is allowed. Field Installation: Yes, Maximum: One scanner per module. Limitations and Prerequisite: See general description above.

**Communication Scanner, Type 2 (#1642)**. This feature provides for medium performance operation. It provides for the transfer of data between storage and the line sets on a byte-by-byte basis. The scanner assembles and disassembles characters. This scanner interrupts the control program on a byte-by-byte basis. The control program provides for the line control, character recognition, code translation and error recovery functions. **Field Installation**: Yes, Maximum: One scanner per module. Limitations and Prerequisite: See general description above.

**Communication Scanner, Type 3 (#1643)**. This feature provides a high performance operation. It provides for data transfer between storage and the line sets on a multi-byte (buffer) basis. Data transfers between storage and the Communication Scanner, Type 3 is accomplished on a storage cycle steal basis (the CS-3 stores the control program for a machine cycle, moves data to or from storage. At the conclusion of the data movement, the control program resumes its operation at the point of the interrupt, unless another "cycle steal" request is pending). This feature supports only synchronous lines and provides control character recognition for BSC and SDLT line controls. It provides ASCII to EBCDIC and vice versa code translation when operating with BSC line control. The Communication Scanner, Type 3 interrupts the control program on either (up to 254 character) buffer boundaries, or by unique control characters, or at certain error conditions. It also provides for an auto-dial operation. **Field Installation**: Yes, Maximum: One scanner per module. Limitations and Prerequisites: See general description above.

**COMMUNICATION SCANNER, TYPE 3 HIGH SPEED (#1644)**. The Communication Scanner, Type 3 High Speed (#1644) is a modified CS-3 (#1645) which allows line speeds up to 230.4K bps. Only two half duplex data or one full duplex data line can be attached to this scanner. **Field Installation**: Yes, Maximum: One scanner per frame. Limitations and Prerequisites: See general description above.

**LINE INTERFACE BASES (LIBs)**. LIBs are used to provide the physical attachment of Line Sets in the 3705. LIB Type 1 should be placed in LIB position 1, if Address Substitution or High Speed Select is to be required in the 3705. The LIBs with the highest speed lines should be placed in the lowest LIB positions (position 1 is the lowest).

**FIGURE 1 – Maximum LIB Attachment Capability per Module**:

<table>
<thead>
<tr>
<th>LIBS</th>
<th>3705-1</th>
<th>Module 1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS1</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>CS2</td>
<td></td>
<td>6</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>CS3</td>
<td></td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>CS3 H.S.</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1**: LIBs 1 through 12 can be attached to the Communication Scanner, Type 1 and 2 on the 3705-1.
**Note 2**: LIBs 1, 8, 9 and 10 will attach to the Communication Scanner, Type 3 on the 3705-1 or 3705-11 (excluding Line Sets 1A, 1B and 1C).
**Note 3**: LIBs 1 through 12 will attach to the Communication Scanner, Type 2 on the 3705-11.
**Note 4**: LIBs 5 and 11 can only be placed in the 3705 (first module).
**Note 5**: Line Sets operating over 10,000 bps must be in LIB position 1.

**Note 6**: The Line Set addresses for CS3 H.S. are 0 and 2, only one LIB I can operate with a CS3 H.S.

Limitations: When installed with other LIBs of the same or different type, the maximum cannot be exceeded. There are no restrictions on intermixing LIBs.

**Prerequisite**: A Communication Scanner is required in each module containing LIB(s).

**FIGURE 2 – Line Attachment Configurator**

The positions of the Line Interface Bases within the 3705 and 3706(e) must be specified in accordance with the following table:

<table>
<thead>
<tr>
<th>Positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIB Type</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>12</td>
</tr>
</tbody>
</table>

**Important**: Positions 1, 2, 3 and 4 apply to 3705.

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The positions of the Line Sets within the LIB will, in most cases, be automatically assigned. To determine if this automatic assignment is applicable, use the following flow chart:

Normally, the Specification Sheet should be used only if required by the flow chart below. If, however, specific positions for line sets are desired even when the Automatic Line Set Configuration is suggested, fill out the Specification Sheet and submit it.

Note: A "Special Type Scheduled System" is one in which the 3705 is effectively servicing two different TP networks on a scheduled basis. That is, one set of communication lines is serviced in one time period and a second set of lines in a second time period AND THERE IS NO OVERLAP OF THE TWO SYSTEMS IN TIME.

**LINE INTERFACE BASE, TYPE 1 (#4701).** Provides for attaching Line Sets which interface to EXTERNAL MODEMS, AUTO CALL UNITS, or DIRECTLY ATTACHED TERMINALS. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 2 (#4702).** Provides for attaching Line Sets which interface to TELEGRAPH circuits. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 3 (#4703) and TYPE 4 (#4704).** Provides for attaching IBM Limited Distance and leased line Line Adapters. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 5 (#4705).** Provides for attaching 2400 bps Leased Line Integrated Modems. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 6 (#4706).** Provides for attaching 2400 bps Switched Network Integrated Modem. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 7 (#4707).** Provides for attaching 2400 bps Switched Network Integrated Modem and Auto Call Unit – no Line Sets required with this LIB. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 8 (#4708).** Provides for attaching 1200 bps Integrated Modems and Auto Call Units. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 9 (#4709).** Provides for attaching 1200 bps Integrated Modems and Auto Call Units. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 10 (#5000).** Provides for attaching 1200 bps Integrated Modems with Duplex Data transmission capability. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 11 (#5001).** Provides for attaching 2400 bps Integrated Modems with Duplex Data transmission capability. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE INTERFACE BASE, TYPE 12 (#5002).** Provides for attaching 1200 bps Integrated Modems with a bi-directional Interrupt Signal. Field Installation: Yes. Limitations, Prerequisites and Maximum: See Figure 1.

**LINE SETS:** Line Sets provide the electronic logic to meet the individual requirements of the communication facility. (See Figure 2 for attachment capability of Line Sets with respect to LIBs). Note: All Line Sets except #4719 require external cables to be ordered in addition to ordering the Line Set feature(s).

*If the line speed is over 10,000 bps, the line set must reside in line address position 0, 2, 4 or 6 when attached to Communications Scanner, Type 2, or reside in line address positions 0, 2, 4, 6, 8, A, C or E when attached to Communications Scanner, Type 3. Over 10,000 bps, the line sets must reside in the first LIB, when attached to Communications Scanner, Type 2 or Type 3. NOTE: See Scan Limits, Address Substitution and High Speed Select under "Specify".*

---

**FIGURE 3 – LIB-Line Set Configuration Chart**

Legend:
- X: Denotes a pair of addresses used for a two line interface line set if installed.
- A: Denotes a pair of addresses used for a two autocall interface line set if installed.
- *: Denotes an unused address if this type of LIB is installed.
- #: Denotes a pair of addresses required for this line set if installed.
LINE SET, TYPE 1A (#4711). (Low Speed Start-Stop External Modem) For attachment of two start/stop communication lines at speeds up to 1200 bps, this line set has an EIA RS 232C interface for attachment to an external modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1B (#4712). (Low Speed Duplex Data External Modem) Provides for the attachment of one start/stop duplex communication line at speeds up to 1200 bps, which has an EIA RS 232C interface at speeds up to 1200 bps. This Line Set effectively combines two 3705 communication line ports into a true full-duplex data port. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1C (#4713). (Low Speed Local Attachment) For attachment of two half-duplex IBM start/stop terminals at speeds up to 1200 bps via IBM-provided cables. Modems are not required. Note: The attached terminal must provide a Business Machine Clock and external modem cable to which the 3705/3706 Line Set, Type 1C cable connects. Total cable length must not exceed 200 feet. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1D (#4714). (Medium Speed Terminal Interface - via External Modem) This Line Set provides the interface of external modems(s). One of the following attachments is permissible:

a) Two start/stop communication lines (up to 1200 bps over non-switched or switched facilities) transmitting half duplex data using external modems with EIA RS 232C interfaces.

b) Two synchronous communication lines (up to 9600 bps over non-switched or switched facilities) transmitting half duplex data using external modems with EIA RS 232C interfaces.

c) A Combination of one of each of the above.

Note: When operating this line set over 4800 bps refer to Address Substitution and High Speed Select under "Specify." Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1E (#4715). (Auto Call Unit) Provides two RS 366 interfaces for attachment of external automatic calling units. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures at 1 and 3.

LINE SET, TYPE 1F (#4716). (Medium Speed Local Attachment) For local attachment of two half-duplex, synchronous IBM terminals or 3767 at speeds up to 2400 bps via IBM-provided cables. Modems are not required. This line set requires different cable groups depending upon terminal type. For cabling information, see Installation Manual - Physical Planning, GC-22-7004; for Remote see Multiple/Single (##27-3006). Note: The attached terminal must be equipped with a Business Machine Clock and must provide a standard external cable to which the 3705/3706 Line Set, Type 1F external cable length must not exceed 100 feet. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1G (#4717). (High Speed External Modem) For attachment of a synchronous external modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1H (#4718). (Medium Speed Duplex External Modem) Provides for the attachment of one duplex synchronous communication line at a speed up to 9600 bps which has an EIA RS 232C interface for attachment to an external modem. This Line Set provides for the transmission of data communication over digital circuits in a voice and receive mode. Note: For speeds in excess of 4800 bps, see Scan Limits. Address Substitution and High Speed Select under "Specify" are not allowed with this line set. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1J (#4719). (External Mil Std 188 Interface) Provides for the attachment of one start/stop or synchronous communication line at a speed up to 56.0 bps via an external modem having an interface that conforms to the requirements in Section 7.2.1 of Mil Std 188C. Note: No external cable is provided with this Line Set. For speeds greater than 700 bps, Communication Scanner, Type 2 (#1642) or Communication Scanner, Type 3 (#1643) is required. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1S (#4720). (Common Carrier 56.0 bps Attachment) Provides for the attachment of a single digital line to a CCITT V35 type interface to be used on a communication facility at 56,000 bps. The 1S Line Set may be operated at 14,400 bps or 56,000 bps in conjunction with another 3705. See Scan Limits, Address Substitution and High Speed Select under "Specify." Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1T (#4725). (High Speed Duplex External Modem) 50K bps. This line set will only run with the NCP Program Product. This line set provides for the attachment of one duplex synchronous line which has a digital interface for attachment to an external data set for up to 50,000 bps leased or switched wideband facilities (not program supported for switched facilities). The control program must condition this line interface for external clock control. See Scan Limits, Address Substitution and High Speed Select under "Specify." Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1U (#4726). (High Speed Duplex External Modem) 56K bps. This line set will only run with the NCP Program Product. This line set provides for the attachment of one duplex synchronous line which has a CCITT V35 type interface for attachment to a common carrier communication facility with line speeds up to 56,000 bps. The control program must condition this line interface for external clock control. The 1U Line Set may be operated at 14,400 bps or 56,000 bps in conjunction with a 1Z Line Set (#4728) in another 3705. See Scan Limits, Address Substitution and High Speed Select under "Specify." Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1UA (#4727). (High Speed External Modem) For attachment of one synchronous, half duplex data communication line for operation up to 230.4 Kbps. Has a digital interface for attachment to a leased "wideband" external modem. Field Installation: Yes. Maximum: Two per I.L.B., Type 1 (#4701). Prerequisites: Communication Scanner, Type 1HS (#1644). Limitations: Up to two line sets of this type allowed in the same 3705/06 frame.

LINE SET, TYPE 1TA (#4723). (High Speed External Modem) For attachment of one synchronous, half duplex data communication line for operation up to 230.4 Kbps. Has a digital interface for attachment to a leased "wideband" external modem. Field Installation: Yes. Maximum: One per I.L.B., Type 1 (#4701). Prerequisites: Communication Scanner, Type 1HS (#1644). Limitations: Only one line set per 3705/06 frame.

LINE SET, TYPE 1W (#4727). (High Speed Local Attach) 14.4K or 57.6K bps half duplex data. This line set provides for local attachment of a single half duplex synchronous device which has a CCITT V35 type interface (similar to Line Set Type 1S). Clocking is provided by #4651 such that the attached device must be set for external clock control. The total cable length must not exceed 200 feet (60 meters). This is a combination of 15 feet (4.5 meters) of 3705 Set Cable and 50 feet (15 meters) of attached device cable. See Scan Limits, Address Substitution and High Speed Select under "Specify." Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 1Z (#4728). (High Speed Local Attach Duplex) 14.4K or 57.6K bps duplex data. This line set provides for local attachment of one duplex synchronous device which has a CCITT V35 type interface (similar to Line Set Type 1U). Clocking is provided by #4651 such that the attached device must be set for external clock control. The total cable length must not exceed 200 feet (60 meters). This is a combination of 150 feet (45 meters) of 3705 Set Cable and 50 feet (15 meters) of attached device cable. See Scan Limits, Address Substitution and High Speed Select under "Specify." Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 2A (#4721). (Telegraph Single Current) For the attachment of two single current telegraph lines, each may be wired for 20 ma, 40 ma, or 62.5 ma single current terminal. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 3A (#4731). (Limited Distance Type 1 Line Adapter, 2-wire) For the attachment of two half-duplex, start/stop lines at speeds up to 134.5 bps. Includes two IBM Limited Distance Type 1 (2-wire) Line Adapters and no external modems are required. Note: Total wire length may not exceed 4.75 miles... see SRL GA24-3435* for further details. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 3B (#4732). (Limited Distance Type 1 Line Adapter, 4-wire) For attachment of two start/stop lines at speeds up to 134.5 bps. Includes two IBM Limited Distance Type 1 (4-wire) Line Adapters and no external modems are required. Total wire length may not exceed 4.75 miles... see SRL GA24-3435* for further details. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

SRL GA24-3435:2 or subsequent revisions.

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LINE SET, TYPE 4A (#4741). (Limited Distance Type 2 Line Adapter) For attachment of two half-duplex start/stop lines at speeds up to 600 bps. Includes two IBM Limited Distance Type 2 Line Adapters and no external modems are required. Note: Total speed of both lines must not exceed 6.25-wire-miles. See SRL GAZ24-3435* for further details. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 4B (#4742). (Leased line, Line Adapter, 2-wire) For attachment of two half-duplex, start/stop lines at speeds up to 600 bps. Includes two IBM Leased Line, 2-wire, Line Adapters and no external modems are required. Note: See SRL GA24-3435* for further details. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 4C (#4743). (Leased Line, Line Adapter, 4-wire) For attachment of two start/stop lines at speeds up to 600 bps. Includes two IBM Leased Line, 4-wire, Line Adapters and no external modems are required. Note: See SRL GA24-3435* for further details. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 5A (#4751). (2400 bps Leased Point-to-point Integrated Modem) For attachment of one synchronous line at a speed of 2400 or 1200 bps. The Line Set includes one 2400 bps Integrated modem equipped with Receive Equalization which is suitable for communication over a leased voice grade channel with an IBM modem similarly equipped. No external modem is required. This integrated modem must communicate with a 2400 bps IBM 3872 or equivalent IBM modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 5B (#4752). (2400 bps Leased Multi-point, Control, Integrated Modem) For attachment of one synchronous line at a speed of 2400 or 1200 bps. This Line Set includes one 2400 bps Integrated Modem which is suitable for communication over a leased point-to-point channel with a similar modem equipped with both Transmit and Receive Equalization. No external modem is required. This integrated modem must communicate with a 2400 bps IBM 3872 or equivalent IBM modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 6A (#4761). (2400 bps Switched Network, Integrated Modem) For attachment of one synchronous line at a speed of 2400 or 1200 bps. This Line Set includes one 2400 bps Integrated Modem which is suitable for communication over a Public Switched Network via Common Carrier Data Coupler Type CBS (or equivalent). Automatic Answering of incoming calls will be performed by the modem. Automatic Equalization is effected at the beginning of each call. This modem communicates with either a 2400/1200 bps Integrated Modem or the 3872D Modem equipped with a Switched Network feature. No external modem is required. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 8A (#4781). (1200 bps Leased Line Adapter) Provides for the attachment of two start/stop or synchronous lines at speeds up to 600 bps or 1200 bps. This Line Set includes two 1200 bps Line Adapters suitable for communication over a leased point-to-point line with similar Line Adapters. No external modems are required. This integrated modem must communicate with another 1200 bps IBM integrated modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 9A (#4791). (1200 bps Switched Network Line Adapter with Automatic Call Origin) Provides for the attachment of one synchronous line at a speed of 1200 bps or 600 bps. This Line Set includes one 1200 bps Line Adapter equipped with the Automatic Answering and Automatic Call Origin functions suitable for the automatic dialing of a remote terminal, the automatic answering of incoming data, and the automatic deactivating of all switches on the control panel (except power off and power on) when the key is removed from the lock. Two keys are included with this feature. For additional or replacement keys, see "Locks and Keys" on page 10000. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 10A (#4784). (1200 bps Leased Duplex Data Integrated Modem) For attachment of one duplex synchronous line at a speed of 1200 bps. This Line Set includes one 1200 bps Duplex Data Integrated Modem. No external modem is required. This integrated modem must communicate with another 1200 bps IBM integrated modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 11A (#4754). (2400 bps Leased Point-to-Point Duplex Data Integrated Modem) For attachment of one duplex synchronous line at speeds up to 2400 bps. This Line Set includes one 2400 bps Duplex Data Integrated Modem with equalization suitable for leased duplex point-to-point operation. No external modem is required. This integrated modem must communicate with a 2400 bps IBM 3872 or equivalent IBM modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 11B (#4755). (2400 bps Leased Multi-point Master Duplex Data Integrated Modem) For attachment of one duplex synchronous line at speeds of 2400 or 1200 bps. This Line Set includes one 2400 bps Duplex Data Integrated Modem without equalization suitable for leased duplex multi-point master operation. No external modem is required. This integrated modem must communicate with a 2400 bps IBM 3872 or equivalent IBM modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 12A (#4785). (1200 bps Leased Integrated Modem with a Bi-directional Interrupt Signal) This Line Set provides for two systems communicating at speeds up to 1200 bps. This System operates in 2741 Line Control at the above capability. The Line Set includes the same functional capabilities as Line Set, Type 8A. No external modem is required. This integrated modem must communicate with a 2400 bps IBM integrated modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

LINE SET, TYPE 12B (#4786). (1200 bps Switched Integrated Modem with a Bi-directional Signal) This Line Set provides for two systems communicating at speeds up to 1200 bps. This integrated modem must communicate with another IBM 1200 bps integrated modem. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

GENERAL FEATURES

UNIT PROTECTION (#8510). Provides a lock on the 3705 that deactivates all switches on the control panel (except power off and power on) when the key is removed from the lock. Two keys are included with this feature. For additional or replacement keys, see "Locks and Keys" on page 10000. Field Installation: Yes. Maximum, Limitations and Prerequisites: See Figures 1 and 3.

BUSINESS MACHINE CLOCK (#4650). Within each communication channel there must be a clocking mechanism to time the data rate. When this clocking mechanism is not provided by either the communication facility or the "modem," then the 3705 must provide the clocking through the use of a Business Machine Clock. This clock speed should be equal to the data rate in bits per second (bps). The Business Machine Clocks are contained within the Communications Scanner. A clock in a Communication Scanner cannot be used by communication lines attached to a different Communication Scanner.

Each Communication Scanner, Type 1 or 2 must have at least one Business Machine Clock, with each scanner limited to a maximum of four clocks. If a Communication Scanner has at least one communication line attached where either the modem or the communication facility provides the clocking, then one of the possible four clocks in the scanner must be less than one-half the speed of the lowest externally clocked line attachment. All direct attached terminals must have a Business Machine Clock in the 3705 which matches the transmission rate (bps) of the terminal. Notes: [1] The Business Machine Clock is assigned to a given communication line interface under the control of the program operating in the 3705 [2] For one type of establishing Business Machine Clock requirements, Line Set 5A, 5B, 6A and 11A, and Line Interface Base, Type 7 provide "modem clocking" .... [3] Communication Scanner, Type 3 must have Business Machine Clock, specify #9615 and may have one other clock (either specify #9609 or #9610).

The following Line Sets must have a Business Machine Clock:

Line Set, Type 1A (#4711) Line Set, Type 4B (#4742) Line Set, Type 1C (#4713) Line Set, Type 8A (#4781) Line Set, Type 1F (#4716) Line Set, Type 8B (#4752) Line Set, Type 2A (#4771) Line Set, Type 3A (#4731) Line Set, Type 3B (#4732) Line Set, Type 12A (#4785) Line Set, Type 4A (#4741) Line Set, Type 12B (#4786)

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The following Line Sets may require a Business Machine Clock if the clocking is not supplied by the modem:

- Line Set, Type 1D (#4714)
- Line Set, Type 1H (#4718)

A Business Machine Clock is required for each speed; specify one of the following speeds for each Business Machine Clock.

<table>
<thead>
<tr>
<th>Speed (bps)</th>
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<th>Speed (bps)</th>
<th>Specify</th>
</tr>
</thead>
<tbody>
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<tr>
<td></td>
<td></td>
<td>150, 600, 1200</td>
<td>#9615*</td>
</tr>
</tbody>
</table>

* Specify #9615 is only available with Communication Scanner, Type 3 (#1643) and is mandatory on Communication Scanner, Type 3 High Speed (#1644).

**BUSINESS MACHINE CLOCK (#4651)**: when either Line Set Type 1W (#4727) or Line Set Type 1Z (#4728) is located in a L.I.B. Type 1 (#4701) then a Business Machine Clock must be added to the L.I.B. Specify: #9621 for 14.4K bps, #9622 for 57.6K bps.

Prerequisites: 1.1 #4727 or #4670 in position one of a model.

**REMOTE PROGRAM LOADER**:

- Prerequisite: Remote Program Loader (#6260).
- Applies to the 3705 in A model, but to the last in B, C, D models.
- Provides cooling such that a 3705-1 with Remote Program Load (#6260) can operate in a Class B Extended Environment with a temperate range of 10° C to 37.8° C (50° F to 100° F).

**EXTERNAL ENVIRONMENT (#3620)**: Applies to the 3705 in A model, but to the last in B, C, D models. Provides cooling to a 3705-1 without the Remote Program Load Adapter (#6260) on a temperature range of 10° C to 36° C (50° F to 100° F). Field Installation: Yes. Prerequisite: Remote Program Loader Adapter (#6260) on the associated 3705-1 frame.

**INTERNAL AIR CIRCULATION 1 and 2 (#4670, 4671)**: Internal Air Circulation 1 (#4670) and Internal Air Circulation 2 (#4671) provide for dissipation of the internal heat for the first and second blocks of core storage respectively, in each module of the 3705-1. The following table indicates which Air Circulation features (#4670 and #4671) must be ordered for each module depending on the 3705-1 model involved.

<table>
<thead>
<tr>
<th>Model</th>
<th>#4670</th>
<th>#4671</th>
</tr>
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<tbody>
<tr>
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<td>X</td>
</tr>
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<td>B2</td>
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Maximum: Depending on the 3705 model, one #4670 and one #4671 per 3705, as indicated in the above chart. Field Installation: Yes.

**REMOTE POWER OFF (#6250)**: This feature applies to both the 3705-I and 3705-II, but the following detail reflects the requirements of this section (Remote 3705-I only). Provides the capability of turning the 3705-I power off with a command over a communication line. Maximum: One per 3705-I. Field Installation: Yes. Prerequisite: Remote Program Loader (#6260).

**REMOTE PROGRAM LOADER (#6260)**: For the 3705-I, Provides the means of remotely loading the NCP Program when there is no Channel Adapter on the machine. Maximum: One per 3705-I. Field Installation: Yes. Limitation: For the 3705-I, cannot be installed with any of the following: Channel Adapter, Type 1, 2, 3 or 4 (#1541-1544), Communication Scanner, Type 3 (#1643), LIB Type 5 (#4705), or LIB Type 11 (#5001). Also see Extended Environment (#3620) and Internal Air Circulation 1 and 2 (#4670 and #4671). Specify: For plant or field installation, one of the following must be specified, depending on the 3705 model involved.

- For "A" model — Specify #9591 (RPL Model A) on 3705-I.
- For "B" model — Specify #9592 (RPL Model B) on 3705-I.
- For "C" model — Specify #9593 (RPL Model C) on 3705-I.
- For "D" model — Specify #9594 (RPL Model D) on 3705-I.

**REMOTE PROGRAM LOADER-II (#6261)**: For the 3705-II. Provides the means of remotely loading the NCP with or without a Channel Adapter on the machine. Maximum: One per 3705-II. Field Installation: Yes. Limitation: For the 3705-II, cannot be installed with four Channel Adapter Type 4s (#1544), or any other proper CA combination (see CA section) is acceptable; also, the RPL-II feature on the 3705-II cannot be installed with LIB Type 5 (#4705) or LIB Type 11 (#5001) unless there is a Channel Adapter also installed.
### 3705 Communications Controller (cont'd)

#### Special Feature Prices:

<table>
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<th>MAC/MLC</th>
<th>ETP/2yr</th>
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Not to be reproduced without written permission.
Purpose: Printer for all models of the 3741 (GSD product).

Highlights: Prints serially at a maximum rate of 40 cps, using the EBCDIC character set. The maximum print line is 128 print positions at 10 characters per inch spacing. Line spacing is 6 lines per inch.

The unit has a pin feed platen which permits the feeding of marginally punched continuous paper. A choice of 12-1/2, 13-1/8 or 13-7/8 inch hole-to-hole pin feed platen widths may be specified for the basic printer... see "Specify." Smaller platens (to 5-1/4 inches hole-to-hole width) and platen interchangeability can be accommodated in conjunction with the adjustable margin special feature... see "Special Features."

Matrix characters are formed by 7 vertical wires printing dots in up to 4 of 7 possible horizontal positions. Refer to SRL GA24-3488 for forms design considerations and limitations. Up to six-part forms can be printed with a maximum thickness of .018" (for optimum feeding and stacking, no more than three parts are recommended). Card stock continuous forms are not recommended.

PREREQUISITES: 3713 Printer Attachment (#8111) and appropriate Expansion Feature (#3891, 3892) on the 3741 Data Station or 3741 Programmable Work Station. See GSD sales manual.

Supplies: A black ribbon, IBM part number 1136970 or equivalent, is required.


SPECIFY: [1] Voltage (AC, 1-phase, 60 Hz): #9901 for 115 V, #9902 for 208V, or #9904 for 230 V... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. FIELD INSTALLATION: Not recommended.

[3] Pin Feed Platen: #9162 for 126 print positions (13-1/8" hole-to-hole), or #9167 for 120 print positions (12-1/2" hole-to-hole), or #9168 for 128 print positions (13-7/8" hole-to-hole).

Smaller pin feed platen widths can be specified in conjunction with the Adjustable Margin Feature (#1115)... see "Special Features."

NOTE: Do not order #9168 unless paper is available in your area.

ETP/MAC/MLC PRICES: Mdl MRC 2 yr Purchase MMMC
3713 1 $174 $148 $5,610 $72.50

Plan Offering: Plan B Warranty: B Machine Group: D Purchase Option: 35% Per Call: 1 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

SPECIAL FEATURES

ADJUSTABLE MARGIN FEATURE (#1115). Provides operator adjustable right and left margin stops and accommodates additional platen widths and platen interchangeability. For available platen widths and feature numbers to be specified (#9151 thru #9168), see M 10000 pages. To obtain additional platens, see RPQ. Field Installation: Yes. Note: Do not select #9168 unless paper is available in your area.

ETP/MAC/MLC Special Feature Prices: MRC 2 yr Purchase MMMC
Adj Margin Feature #1115 $5 $4 $218 $1

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in the M 10000 pages. See M 10000 for additional information and field installation.

FORMS STAND (#4450) — Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.
3732 TEXT DISPLAY STATION

Purpose: Provides a text entry and editing keyboard and display for the 3730 Distributed Office Communication System.

Highlights: The 3732 consists of a display and keyboard (special feature) that have been designed specifically to provide text entry and editing facilities for the 3730 Distributed Office Communication System. The 3732 displays all the text characters that can be entered at the keyboard and that can be printed by the system printers (with the exception of certain compound characters printed by overstriking). In addition, special graphic characters are displayed to denote certain text control functions.

The display is a 15 inch (diagonal) cathode ray tube display providing 24 lines of 80 characters each, to give a total of 1920 characters. For text entry and editing, lines 1 and 24 are reserved for system use, leaving 22 lines for text entry (line 1 displays a scale to indicate character position, and is used to display formatting information such as margin settings and tab stops, and to track cursor position; line 24 is used to display status information). When, with user programming, the 3732 is used for full-screen processing, the user has control over all 24 lines (except for minor restrictions on the use of lines 1 and 24). The display includes an anti-glare screen.

One of three keyboards may be ordered (as special features): a 77-key typewriter keyboard (#4621), a 77-key ASCII typewriter keyboard (#4622), or a 75-key typewriter keyboard (#4623). The keyboards contain a central text entry section that is similar in layout to typewriter keyboards. Both upper and lower case characters may be entered. In addition, the keyboards contain 29 function and control keys concerned with document creation, editing, formatting, and printing. The 3732 must be installed with a keyboard.

Text functions: The following text entry and editing functions are provided by the 3732:
- Automatic new line and word split (allowing an operator to enter text without being concerned about line endings)
- Temporary left margin (providing automatic indentation)
- Adjustable right margin
- Adjust and no-adjust entry mode
- Insert mode
- Tabulation (providing normal, decimal, and centering tab stops)
- Column tabulation (allowing an operator to enter tabular material column-by-column)
- Required characters (new line, space, backspace, hyphen)
- Special characters (such as superscripts, subscripts, temporary left margin)
- Delete character, word
- Backspace deletion
- Underscore character, word, or group of words (separated by required spaces)

The following system functions are invoked using function keys on the 3732 keyboard:
- Block insert, copy, move, return, delete
- Delete line, sentence
- Screen advance, return
- Page advance, return
- (Go to) End, (Go to) Top of document

Additional 3732 functions include:
- Cursor-positioning keys to move the display cursor to any position within the display area (up, down, left, right, and "home" - the first available text character position)
- An audible alarm tone that, rather like the bell on a typewriter, warns an operator that a line or a screen is nearly full (e.g., in no-adjust mode the alarm tone sounds when a character is entered or moved into a position five characters from the right margin)
- A HELP key to aid users who have problems when operating the 3732
- A PRINT key to send the currently displayed document to a preassigned print queue, for printing as soon as the assigned printer is available
- An Adjust key to adjust the line length of the currently displayed document and to divide the document into pages
- A Display key to allow or inhibit the display of certain special characters (such as space, and tabs)

Attachment to Controller: The 3732 attaches to a 3791 Controller mt1 11C, 12A or 12B, via a coaxial cable at a distance of up to 609 meters (2,000 feet).

PREREQUISITES: 3791 Controller mt1 11C, 12A or 12B, with Configuration Support #9171 installed. Refer to 3791 in 'Machines' for details.

Security and Integrity Features: A Security Keylock (#6340) helps prevent unauthorized use of the 3732. Text cannot normally be displayed or modified unless the key is in the ON position.

Problem Determination Procedures: To minimize machine downtime, users are encouraged to determine the cause of 3732 malfunction using IBM-provided Problem Determination Procedures. Data obtained from these procedures is used to correct customer operating or programming errors, or is passed to a customer engineer to aid in isolating a machine malfunction. The Problem Determination Procedures are presented in an easy-to-follow graphic form and are contained in the 3732 Problem Determination Guide, GA33-3024 (stored in the keyboard).

Publications: Refer to the latest level of IBM System/370 Bibliography of Industry Systems and Application Programs, GC20-0370, for details of 3732 publications and 3730 system publications.

SPECIFY: [1] Voltage (120V AC, 1-phase, 3-wire, 60 Hz): #9090 for locking plug, or #9991 for non lock plug. If standard 2.8 meter (9 foot) power cable is not required, specify #9511 for 1.8 meter (6 foot) cable, #9512 for 3.7 meter (12 foot) cable, or #9513 for 4.5 meter (15 foot) cable.


[3] Character Set: Specify one of the following:
- #9082 - for EBCDIC Character Set (word processing). Used with 77-key Typewriter Keyboard (#4621) and 75-key Typewriter Keyboard (#4623).
- #9084 - for ASCII Character Set (B). Used with 77-key ASCII Typewriter Keyboard (#4622).

PRICES

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<td>$2,905</td>
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SPECIAL FEATURES

KEYBOARDS (#4621, 4622, 4623).
- #4621 - 77-key Typewriter Keyboard, movable, typewriter-like layout, with 48 text entry keys and 29 function and control keys. Prerequisite: EBCDIC Character Set (#9082).
- #4622 - 77-key ASCII Typewriter Keyboard, movable, ASCII typewriter-like layout, with 48 text entry keys and 29 function and control keys. Prerequisite: ASCII Character Set (B) (#9084).
- #4623 - 75-key Typewriter Keyboard, movable, typewriter-like layout, with 46 text entry keys and 29 function and control keys. Prerequisite: EBCDIC Character Set (#9082).

Maximum: One of the above. Field Installation: Yes.

SECURITY KEYLOCK (#6340). A lock and key that normally prevents modification or display of the data in the display when the key is in the OFF position. For additional or replacement keys, see M 10000 pages. Maximum: One. Field installation: Yes.

Special Feature Prices: MRC 2 yrs Purchase MLC

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<tr>
<td>77-key ASCII</td>
<td>4622</td>
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<tr>
<td>75-key Typewriter</td>
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</tr>
<tr>
<td>Security Keylock</td>
<td>6340</td>
<td>35SUC</td>
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IBM 3735 PROGRAMMABLE BUFFERED TERMINAL

Purpose: A programmable terminal capable of buffered source document creation, concurrent data capture, and subsequent batch transmissions via an integral binary synchronous communications adapter.

For possible use with the System/3, see GSD manual.

Highlights: The 3735 consists of a control unit and an associated keypad printer. The programmable control unit houses a fixed disk facility, logic circuits, and a binary synchronous communications adapter.

Keyboard -- an IBM Selectric® Keyboard with operator guidance lights and switches.

Printer -- a Selectric II 15.5 cps printer with friction feed platen (standard) or a pin feed platen (optional). Vertical forms movement, and automatic print element positioning can be provided by the control unit.

Control Unit -- contains a non-removable disk with approximately 62.8K bytes of customer usable storage, plus the IBM written terminal control program. Additional user storage is available in two increments of 41.8K bytes each and a third increment of 167.5K bytes, for a total of 314.1K bytes. Installation of some special features will reduce customer usable storage as shown in the "Customer Storage/Feature Table." A binary synchronous communications adapter for transmission rates to 4800 bps is standard. The control unit provides the focal point for application interaction with customer Form Description Programs, the IBM written subroutines, and the operator guidance lights and switches on the keyboard.

Customer Storage/Feature Table -- the addition of special features singly or in combination with other features will decrease customer usable storage as follows:

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<tr>
<td>1. #7880 and/or #4600</td>
<td>1904 bytes</td>
</tr>
<tr>
<td>2. #4001</td>
<td>3808 bytes</td>
</tr>
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<td>3. #4001 and 1 above</td>
<td>5712 bytes</td>
</tr>
<tr>
<td>4. #1450 alone or with 1, 2 &amp; 3 above</td>
<td>7616 bytes</td>
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</table>

Output Printer -- the 3286 Printer mdl 3 can be attached for 66 cps output printing.

Security Enhancement Features -- the Print Suppress capability (standard) allows selected data fields to be entered without being printed. The Keylock (special feature) is a key-operated switch which is located on the terminal control unit. When the switch is in the "off" position, no keyboardprinter operations are possible. Previously recorded data may be sent to the computer and data may be received from the computer provided the terminal was set up for this operation prior to the Keylock being set to the "on" position.

The Operator Identification Card Reader (special feature) is provided to enter terminal operator identification. This enhances the programmable control of the operator's access to data and allows an audit of his actions. The reader may also be used to enter any sequence of numeric characters pre-recorded on a card for other purposes such as transaction control, account control, and billing. The Operator Identification Card Reader also reads the Magnetic Credit Card announced for the 2730 Transaction Validation Terminal.

Transmission -- the 3735 operates in half-duplex mode over facilities C4, C5, D3, D4, D4SB, D5, D5SB, X1M or X2M ... for details concerning these facilities, see M 2700 pages.

Binary Synchronous Transmission -- allows for transmission rates of 1200, 2000, 2400 or 4800 bps.

The 3735 can communicate over multi-point or dial facilities to 3/850 mdls 22 thru 195, or any 3/370 or 4330 Processor. See "Programming" section for information on programming support.

Transmission Code -- one of two codes can be selected -- see "Specify" for EBCDIC or ASCII options.

Modems -- one Integrated Modem or External Modem can be used.

The standard 3735 provides a cable and standard EIA interface for connection of IBM Modems or non-IBM Data Sets at transmission rates of 1200, 2000, 2400 or 4800 bps. See "Special Features" for Integrated Modems that may be used instead of an external modem/data set. Switched network operation and Auto Answer are standard on the 3735. Multipoint Data Link Control (#5010) is required for leased point-to-point or multipoint operation. Synchronous Clock (#7705) is required for 1200 bps operation.

Speed (bps) | Facility | Integrated Modem | IBM External 3735 Prereq
-----------|---------|----------------|------------------|
1200 | C4 | #5501 | #7705 |
1200 | D3 | 5500 (2) | --- |
2000 | CSM/D4M | --- | --- |
2400 | D4 (multipt or pt-to-pt) | 3863J | 5010 |
2400 | C5 | 5610 | 3872-1 | None |
2400 | D4 (multipt) | 5602 | 3872-1 | 5010 |
2400 | D4 (pt-to-pt) | 5600 | 3872-1 | 5010 |
2400 | D4SB | 5602 or 5600 and 7951 | 3872-1 | 5010 |
2400 | X1M | 5010 |
4800 | D (multipt or pt-to-pt) | 3864J | 5010 |
4800 | C6 | --- | 3874-1 | None |
4800 | DS, DSSB | --- | 3874-1 | 5010 |
4800 | DS, DSSB | --- | 3874-1 | 5010 |
4800 | X2M | --- | --- | 5010 |

NOTES: (1) For communication, capabilities, modem utilization, and special features, see 3863, 3864, 3872, 3874 and M 2700 pages.
(2) C1 conditioning not required.

Customer Responsibilities -- it is recommended that a telephone handset, which may be used to originate a call over common carrier Public Switched Facilities, be provided within 15 feet of the 3735. For additional responsibilities see M 2700 pages. In addition, since the 3735 is designed for sequential processing of customer applications, proper forms design is a customer responsibility.

Bibliography: See "Highlights."
3735 Programmable Buffered Terminal (cont'd) portion of the 3735 disk storage for storage and retrieval of records with a single identification key. The maximum record size, including an identification key and two data delimiters, is 236 bytes. The identification key can range from 1 to 128 characters and is stored in combination with a 128 4695 with Buffer Expansion (#1450). Maximum: One. Field Installation: Yes. Limitations and Restrictions: There is no additional information from a multipoint station in a multipoint system.

Maximum: Yes. See "Customer Storage/Feature Table" under "Highlights."

OPERATOR IDENTIFICATION CARD READER (#4600). A small (approximately 3" x 4" x 6") self-enclosed device for reading information from a Magnetically Striped and Encoded I.D. and a Magnetic Credit Card (2-1/8" x 3-3/8"). An 8-foot cable is provided to accommodate table-top use. Power is supplied by the 3735.

Maximum: One. Field Installation: Yes. See "Customer Storage/Feature Table" under "Highlights."

KEYLOCK (#4695). A key operated switch located on the control unit. When the switch is in the "off" position, no I/O is possible from the printer/keyboard. The control unit may be used for transmission services provided. It was set up to do so prior to keylock being set to the "on" position. This feature supplies the keys for additional or replacement keys, see "Locks and Keys" in M 10000 pages. Field Installation: Yes.

MULTIPOINT DATA LINK CONTROL (#5010). Required for leased point-to-point and multipoint transmission. A fixed compromise equalizer is provided for back-up operation. Attachment to the switched telephone network must be established and answered manually. Maximum: One. Field Installation: Yes. See "Customer Storage/Feature Table" under "Highlights."

SWITCHED NETWORK BACK-UP (#7951). Provides the capability of attaching the 2400 BPS Integrated Modem, Multi-point (#5602) or the 2400 BPS Integrated Modem, Point-To-Point (#5606) to the switched telephone network back-up to the prime leased facility. A fixed compromise equalizer is provided for back-up operation. Attachment to the switched telephone network, is made via the common carrier Data Access Arrangement Type CDI, or equivalent. Communication equipment installed on the same line facility must have the feature, and they must use the same transmission code and modem ... see Modems and M 2700 pages. Field Installation: Yes.

1200 BPS INTEGRATED MODEM (#5500). A modem for operation at 1200 bps over leased 2-wire or 4-wire voice-grade channels. Maximum: One. Field Installation: Yes. Prerequisites: Synchronous Clock (#7705), Multipoint Data Link Control (Cable #5010), and Buffer Expansion (Cable #7951 or #7952). The calls on the switched network must be established and answered manually. Maximum: One. Field Installation: Yes. See "Customer Storage/Feature Table" under "Highlights."

File Storage.
IBM 3736 Printer

Purpose: Provides hard copy output for the 3730 Distributed Office Communication System.

Highlights: The 3736 Printer is a bidirectional, serial impact printer used with the 3730 Distributed Office Communication System. The printer is mounted in a desk-high work station that contains the printer control electronics and power supplies. The work station has a knee hole to allow the user to sit at the printer while performing operations such as changing the paper or the print ribbon. To reduce noise, the printer has an acoustic hood.

The 3736 prints on single sheets (cut forms) or on continuous stationery, using a maximum of one original plus five carbon copies. An end-of-form sensor indicates when the printer is out of continuous stationery.

Friction paper feed is standard for single sheets. For feeding continuous stationery, a variable-width forms tractor (#8750) is available as a special feature. In addition, a paper stacker/tray (#5545) and a paper carrier (#5540) are available as accessories for use with continuous stationery. The variable-width forms tractor and the two accessories are necessary for optimum feeding of a wide range of continuous stationery. The variable-width forms tractor alone permits satisfactory feeding of only a limited range of continuous stationery.

Printer Characteristics:
- Uses interchangeable 96-character print wheels in the following type styles:
  - Courier 10-pitch
  - Prestige Pica 10-pitch
  - Prestige Elite 12-pitch
  - Letter Gothic 12-pitch
  - Prints at up to 55 characters per second.
  - Prints at six line per inch (single line spacing).
  - Uses 3736 flim ribbon. An end-of-ribbon sensor indicates when the print ribbon needs replacing.

Paper Characteristics:
- The maximum paper width is 381 mm (15 inches), with a maximum writing line of 330 mm (13 inches). The maximum paper thickness is 0.6 mm (0.025 inches).
- For specifications of forms that can be used on the 3736, see Form Design Reference Guide for Printers, GA24-3488.

Attachment to Controller: The 3736 attaches to a 3791 Controller Mdl 11C, 12A or 12B via a coaxial cable at a distance of up to 609 meters (2,000 feet).

PREREQUISITES: 3791 Controller Mdl 11C, 12A or 12B with Configuration Support #9171 installed. Refer to 3791 in "Machines" for details.

Attended Operation: The 3736 is designed for attended operation: that is, operator intervention may be required from time to time while the 3736 is in use. The 3736 must not therefore be left unattended for long periods at a time, and should not be left running unattended overnight.

Problem Determination Procedures: To minimize machine downtime, users are encouraged to determine the cause of 3736 malfunctions using IBM-provided Problem Determination Procedures. Data obtained from these procedures is used to correct customer operating or programming errors, or is passed to a customer engineer to aid in isolating a machine malfunction. The Problem Determination Procedures are presented in an easy-to-follow graphic form and are contained in the 3736 Operating Instructions (GA33-3027), and also in the Problem Determination Guide for the 3732 Text Display Station (GA33-3024) (stored in the 3732 keyboard).

Publications: Refer to the latest level of IBM System/370 Bibliography of Industry Systems and Application Programs, GC20-0370, for details of 3736 publications and 3730 system publications.

Specify: [1] Voltage (120V AC, 1-phase, 3-wire, 60 Hz): #9891 for non lock plug.


[3] Print Wheel Character Set: Specify one of the following: -- #9002 for EBCDIC character set (word processing), or #9084 for ASCII character set (B).

[4] Print Wheel Typestyle: Specify two of the following:
  - Prestige Pica 10-pitch #9471
  - Courier - 10 10-pitch #9472
  - Prestige Elite 12-pitch #9474
  - Letter Gothic 12-pitch #9475

NOTE: Two print wheels of each selected typestyle will be shipped with the 3736 printer.

IBM will replace worn or damaged IBM print wheels at no charge to the customer on IBM 3736 machines covered by an IBM Lease, Rental, or Maintenance agreement provided that the wear or damage is due to normal machine usage. Replacement will only be made with an IBM print wheel of the same specifications.

PRICES: Mdl MRC 2 yrs Purchase MMIIC
3736 1 $250 $213 $7,455 $ 82

Plan Offering: Plan B Warranty: B Machine Group: D Purchase Option: 55% Useful Life Category: 2 Per Call: 1 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 5%

Customer Set-Up: No

SPECIAL FEATURES

VARIABLE-WIDTH FORMS TRACTOR (#8750). Feeds continuous forms up to a maximum width of 368 mm (14.5 inches). Maximum: One. Field Installation: Yes.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature Prices:</th>
<th>MRC 2 yrs Purchase</th>
<th>MMIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tractor #8750</td>
<td>$250SUC $250</td>
<td>N/C</td>
</tr>
</tbody>
</table>

ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the feature number indicated below at the price listed in the M10000 pages. For all other orders, see M10000 pages.

PAPER STACKER/TRAY (#5545) -- Holds fan-fold continuous form paper and stacks the paper as it leaves the printer.

PAPER CARRIER (#5540) -- Guides the paper onto the paper stacker/tray as the paper leaves the printer. The paper carrier also has a tear-off blade and rod to hold continuous roll paper.

ADDITIONAL PRINT WHEELS -- Additional print wheels for typestyles required other than the two specified with the 3736 order should be ordered as accessories.

SUPPLIES:

PRINT RIBBON -- Use IBM 3736 film ribbon, IBM Part No. 1299060 or equivalent

NOTE: It is the customer's responsibility to purchase print ribbons, and to ensure that they are available in time for machine installation.
3760 Dual Key Entry Station (Models 1 and 2)  
3760 Key Entry Station (Model 3)

Purpose: Used to key data onto the 3791 Controller disk. The disk is used as a data storage medium prior to transmission of batched data by channel or SDLC communications facilities to any virtual storage 5/370 or 4300 Processor. Data extraction can be done by diskettes.

Model 1  
A Dual Key Entry Station ... Display Panel ... attached to the 3791 with Device Attachment Type I (#7900) or Device Attachment Type I, Additional (#7922).

Model 2  
Same external appearance as Model 1. The first Model 2 is attached to Model 1 via 3760 Model 2 Attachment (#7920). The second Model 2 is attached to Model 1 via a second 3760 Model 2 Attachment (#7920).

Model 3  
A single Key Entry Station ... Display Panel. Has same functional characteristics as model 1. Attaches to the 3791 with Device Attachment Type I (#7900) or Device Attachment Type I, Additional (#7922). Can be optionally attached to up to four 3791 Controllers simultaneously with the capability to switch between them. 3760 mdl 2s cannot be attached.

Model Changes: Model conversions cannot be made.

Highlights: Model 1 and Model 2 -- each physical station provides two keyboard operator positions each with keyboard and display panel area. Model 3 -- provides one operator position with keyboard and display panel area.

Has buffered storage area into which data is keyed prior to recording on the 3791 disk storage thus allowing for correction of detected errors before record is stored. Formats control the automatic functions of skipping, duplicating, editing, etc. Modes of operation are under keyboard control.

For systems capabilities, see 3790 Communication System/Data Entry Configuration in 3790 “Systems” pages.

Keyboard -- has a standard 66 character alphanumeric combination keyboard with "EL" character set for key entry and verifying. In addition to data keys, the keyboard has: Record/Field-Character Backspace .... Field-Character Advance .... Auto Skip/Dup and Auto Enter Key Switch ... Display Record ... Next Format ... Record Position ... Insert and Delete .... Cursor Up and Down .... Cursor Placement at Command Line .... Mark Record and Scan Next Record Keys. Command Keys (#9079) are provided as a Specify feature. Option available are ASCII Keyboard and proof arrangements of both the EBCDIC and the ASCII keyboards.

Display Panel -- up to 236 characters can be displayed to each operator ... six rows of 40 positions each ... first row is the Command Line on which messages, commands, error types, and mode of operation are displayed ... rows two thru six display keyed data as it is entered ... a fill-in-the-blanks format may be displayed and data is entered until the cursor automatically skips over the indicative format data ... Status Indicators ... on the left and right side of the panel ... left side indicators are: Operator Attention, Auto Skip/Dup, Display Record, Auto Enter, and Verify Mismatch ... right side indicators are: Operator Attention, Station Available, Enter, Verify, Insert Mode and Dup Not Allowed.

PREREQUISITES:
For 3760 Model 1 and Model 3 -- 3791 Controller with Device Attachment Type I (#7900) or Device Attachment Type I Additional (#7922), Additional Disk Heads (#3220, 3221), Control Storage Extension (#1590), and one or more Control Storage Increments (#1802, 1012).

For 3760 Model 2 -- 3760 Model 1 with 3760 Model 2 Attachment (#7920).

For details, see M 3791 pages.

Bibliography: GC20-0370

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking Plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock Plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V. NOTE: Model 1 and the two attached Model 2s require the same power specifies.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. NOTE: Color accent is provided on the knee panel only and may be any of the above colors ... Top and Side panels will always be white.


specify #9393 for ASCII.

Proof versions have the alphanumeric keyboard with a numeric key arrangement similar to that of an adding machine.

All 3760 model 2s will have the same arrangement as the attached 3760 mdl 1. If required, specify: 
#9425 for proof keyboard, ASCII  
#9426 for proof keyboard, EBCDIC

Prerequisite: Storage Extension (#7115) (mdl 1 only) and Configuration Support #9175 or #9195 on the 3791.

[5] Command Keys: #9079 Provides, through the command key at the left side of the space bar, the ability to issue commands -- HELP ... COPY ... FLAG ... ACCEPT ... RETURN ... CONTINUE SEARCH ... SAVE ... DISPLAY FORMAT ... by pressing the command key first and then the appropriate top row key of the keyboard. A sticker on the keyboard cover, just above the top row, identifies the command functions of the keys. MAXIMUM: Two per 3760 mdl 1 and 2 ... one per mdl 3. FIELD INSTALLATION: Yes, PREREQUISITE: Storage Extension (#7115) on the 3760 mdl 1.

[6] Conditional Display: #9220. This option may be specified to prevent keyboard overrun in some situations. The function works on all operator positions attached to the model 1 with this feature. The maximum: One per 3760 mdl 1. Field Installation: Yes. PREREQUISITE: Storage Extension (#7115) (mdl 1 only) and Configuration Support #9175 or #9195 on the 3791.

SPECIAL FEATURES

SECURITY KEYLOCK (#6350). [Md1, 3 only] A key operated switch. When the switch is in the "locked" position, entry of data into the 3760/mdl 1, 2, and 3, and all mdl 2s attached to mdl 1s is prevented. Field installation: Yes. NOTE: For additional and/or replacement keys, see M 10000 pages.

SELECTOR SWITCH (#6660). [Mdl 3 only] Provides a four position rotary switch, allowing a 3760 mdl 3 to be switched between up to four 3791 Controllers. Maximum: One per 3760 mdl 3. FIELD INSTALLATION: Time of manufacture only. PREREQUISITE: Security Keylock (#6350).

STORE EXTENSION (#7115). [Md1 1 only] Provides additional storage in 3760 mdl 1, permitting installation of Command Keys (#9079), Proof Keyboard #9425 or #9426 on the 3760 mdl 1 and 2, and Conditional Display #9220 on the 3760 mdl 1. Maximum: One per 3760 mdl 1. FIELD INSTALLATION: Yes.

3760 MODEL 2 ATTACHMENT (#7920). [Mdl 1 only] To attach one 3760 mdl 2 to a 3760 mdl 1. Maximum: Two (#7920) per 3760 mdl 1. FIELD INSTALLATION: Yes.

ETP/MAC/MILC

<table>
<thead>
<tr>
<th>PRICES: Mdl 1</th>
<th>MRC 2 yr</th>
<th>Purchase MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3760 1</td>
<td>$259</td>
<td>$220</td>
</tr>
<tr>
<td>2</td>
<td>141</td>
<td>120</td>
</tr>
<tr>
<td>3</td>
<td>168</td>
<td>160</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B  Warranty: B  Machine Group: D
Purchase Option: 45% Useful Life Category: 2  Per Call: 1  
Termination Charge Months: 5  Termination Charge Percent: 25%  Upper Limit Percent: 0%

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IBM 3762 PAYMENT TRANSACTION PROCESSOR

Purpose: To process payment transactions by scanning OCR-A encoded data from turn-around documents (stubs), validating key-entered payments amounts and storing selected payment information onto the disk in the 3791 Controller, to which the 3762 attaches. One-step processing is achieved with the appropriate special features producing proper batches of inscribed and endorsed checks for deposit in the bank with user-specified audit information as the payment amount can be entered by the operator via the keyboard. After (user-specified) editing and checking of the data entered, the amount paid is checked for acceptability (according to user-specified criteria). The output record is subsequently prepared and transferred to the attached 3791 Controller for intermediate storage on the 3791 disk. Special features include audit trail printing on stubs, checks and deposit tickets, E13B inscribing of checks and deposit tickets, endorsing of checks, and journal tape printing of the amounts processed. Printing is under program control.

Table of Acceptable Characters and Printing Devices

<table>
<thead>
<tr>
<th>OCR-A</th>
<th>OCR-B</th>
<th>.095&quot; Stand and 1403 (6)</th>
<th>1428 (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digits Delimiters</td>
<td>Digits Delimiters</td>
<td>0 - 9</td>
<td>0 - 9</td>
</tr>
<tr>
<td>Fork</td>
<td>Chair</td>
<td>LVM (2)</td>
<td>LVM (2)</td>
</tr>
<tr>
<td>LVM (2)</td>
<td>Double Blank (3)</td>
<td>Double Blank (3)</td>
<td>Double Blank (3)</td>
</tr>
</tbody>
</table>

Printers

Selectric® 1403 1403 1403 1403
3203 3203 3203 3203
3211 3211 3211 3211
3800 3800 3800 3800
Offset Offset Offset Offset

NOTES:
(1) Also called 407-I font. Train arrangements must have suffix 2, e.g., HN2.
(2) The LVM is a pre-printed vertical line, 3.70 mm (0.145") minimum height, centered in the print band, having the normal character stroke width and occupying a full character space.
(3) A Double Blank is a blank space of at least 4.3 mm (0.170") . Single and double blanks may not be specified intermixed in one code line.
(4) A Single Blank is a blank space of at least 2.3 mm (0.090") and less than 4.3 mm (0.170`).
(5) The Right and Left Margin are each 6.35 mm (0.250") wide.
(6) The OCR-B, .095" Standard 1403 and 1428 fonts can only be recognized when the Storage Extension feature is in installed. The 3762 can process single-stub, multi-stub and agent transactions. Agent transactions require the Storage Extension special feature for transaction may contain one or more checks. All data entry operating modes available for the 3762 Dual Key Entry stations are also available on the 3762 Payment Transaction Processor. For details, see 3762 Machines pages. Moreover, 3760 operations such as updating of a customer’s address can be performed intermixed with payment transaction processing. For system capabilities, see “3790 Communication System/Data Entry Configuration” in “3790 Communication System” pages. GA33-4571 gives the Introduction to the Functional Description of the IBM 3790 Communication System using the 3762.

Keyboard – has a standard 66 character alphanumeric combination keypad with EL character set for keying (valid in 3760 mode). In addition to standard keys, the keyboard has: Record-, Field-, and Character-Backspace ... Field-Character-Advance ... Auto Skip/Dup and Auto Enter Key Switch ... Display Record, Next Format ... Record Position ... Insert and Delete ... Cursor Up and Down ... Command Line and Command ... Mark Record ... Hex/Alternating ... Key Sequence ... Save ... Record ... Continue ... Display Record, Exit. Use of the top row of keys as command keys for the following twelve commands is standard: HELP, COPY, FLAG, ACCEPT, RETURN, CONTINUE, DELETE, SAVE, FORMAT, DISPLAY, TOTAL, CHECK, Notice* and PURGE.

* Only active with Agent Processing.

Optionally available are ASCII keyboard, and Proof arrangements of both the EBCDIC and the ASCII keyboards. The Proof keyboard modifies the standard keyboard to provide a numeric key arrangement similar to that of an adding machine. See Specify below for details.

Display Panel – up to 236 characters can be displayed to each operator on six rows of 40 positions each. ... a fill-in-the-blanks format may be displayed and the cursor will automatically skip over the prompting information as data is entered. Status Indicators ... on the left and right side of the panel ... left side indicators are: Operator Attention, Auto, Missmatch, Verify, and Verify Mismatch ... right side indicators are: Operator Attention, Station Available, Enter, Verify, Insert Mode and DUP. Not allowed, spec on the 3762 special format screen is displayed for payment transaction processing.

Transport – contains an entry slot, a document transport mechanism, a pocket selector and two pockets ... documents are handled. Documents move from the entry slot past the scanner to the two pockets. The transport accepts stubs ranging from 76.2 to 152.4 mm (3.0 to 6.0") high and 69.85 to 222.25 mm (2.75 to 8.75") long, provided the height/length ratio is 1.4:1 or less, and checks and deposit tickets ... with standard ABA check sizes. Allowable weight ranges from 16 to 32 lbs and card stock. For details, see 3762 Paper and Printing Requirements, GA33-4572.

Scanner – consists of four lamps, a lens, and a linear array of 64 photodiodes and is located in the transport. Its vertical position is operator settable to the appropriate position of the codeline of printing to be scanned on the document. For details on permissible codeline locations see 3762 Paper and Printing Requirements, GA33-4576.

Pockets – provided are two document pockets with a depth of 44.4 mm (1.75") each. Stubs and checks are automatically selected to the two pockets.

Documents and Printing – the input documents and printing must conform to the specifications described in 3762 Paper and Printing Requirements, GA33-4576. Ribbons and background inks meeting the outlined criteria will give good print quality. Film Ribbon Selectric – Part No. 1136310 or 1136391 ... for Fabric Ribbon Selectric ... 1136318 ... for 1403 (mdls 2 and N1) ... 1136430, 141446 and 424326 ... for 3211 ribbon 1136826 or 1136827 ... for 3203 (mdls 1, 2 and 3) ... 1136430. Ribbons not having similar characteristics may result in reduced recognition performance. The IBM 3762 Document Gauge can be ordered as GX33-8505.

Document Tray – two document trays are provided with every 3762, one for each operator position. The document tray can be used by an operator to hold the stack of stubs and checks to be entered. For additional or replacement document trays, see M 10000 pages.

PREREQUISITES: In 3791 – Controller Device Attachment Type I (#7900) and Device Attachment Type I, Addl (#7922) depending upon the number of units attached, Addl Disk Heads (#3251), Control Storage Expansion (#1590), and Control Storage Increments (#1603, #1613) as required. For details, see M 3791 pages. Configuration guidelines are given in GA33-4572.

Bibliography:
GC20-0370

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug – #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug – #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. NOTE: Color accent is provided on the knee.
Keyboard/Language Arrangements: Proof versions have the alphameric keyboard with a numeric key arrangement similar to that of an adding machine.

3762 Payment Transaction Processor (cont'd)


[4] Keyboard/Language Arrangements: Proof versions have the alphameric keyboard with a numeric key arrangement similar to that of an adding machine.

#9420 for ASCII
#9421 for EBCDIC
#9423 for Proof Keyboard (ASCII)
#9424 for Proof Keyboard (EBCDIC)

NOTE: All 3762 stations attached to the same 3791 Controller must have the same keyboard/language arrangement. The Proof versions may be mixed with the Non-Proof version in a 3790 system but not in the 3762 unit.

PRICES: Mdl  MAC/ MLC Purchase MMMC
3762  1 $1,410 $1,200 $50,400 $220

Plan Offering: Plan B Warranty: B Machine Group: D
Purchase Option: 50% Useful Life Category: 2 Per Call: 1
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

AUDIT TRAIL PRINTERS (#1310). This feature consists of two matrix print devices, one in each transport. It prints a seven by seven dot characters with a pitch of 8.5 characters per inch ... a maximum of 40 print positions on one line. Printing is on the back of the documents starting at 3.0 mm (1.2") from the leading edge, on stubs, checks and deposit tickets, centered 66.5 mm (2.62") from the bottom edge. Fields to be printed on stubs and checks are selected by the user during format definition (not for Deposit Tickets). The character set consists of 10 digits, 26 letters, 7 symbols and blank. Supplies: Cartridge ribbon Part No. 1136970 or equivalent. Field Installation: Available at time of manufacture only.

ENDORSERS (#3805). This feature consists of two endorsing stations, one in each transport. It prints a user designed endorsement legend on the reverse side of the checks. The maximum size of the legend is 28 x 33 mm (1.1 x 1.3"). The user can specify the horizontal endorsement position close to the leading or the trailing edge during format definition. Supplies: Endorse Plates -- for ordering.

Specify: Endorser ink roll -- #9145 for black, #9146 for green, #9147 for purple and #9148 for red. Field Installation: Available at time of manufacture only.

JOURNAL TAPE PRINTERS (#4660). This feature consists of two journal tape print devices, one for each operator. It lists the check amounts processed within a deposit and the deposit total as well as the appropriate deposit identification. When processing agent transactions the individual stub amounts are printed. With the individual amounts, a three digit item identification number is printed in italics in the three leftmost character positions. The two rightmost positions are reserved for a code that identifies the printed line. In total 15 character positions are available. The printed tape is within reach of the operator for tear off at completion of the deposit. Supplies: Ink ribbon -- recommended material Nylon or Vinyon fiber (FF40). Spool diameter 35.1 mm (1.38"). Spool type -- standard only, ribbon width 12.7 mm (.5"), length 6096 mm (240"). Part No. 1299087 (black) or equivalent. Journal Tape -- single or two-ply width 57.2 mm (2.25"), roll diameter 81.0 mm (3 and 3/16") max. Single-ply -- recommended paper weight 16 lbs @ 5% (approx. 60 gr/m²), tape has to be colored through the last 1.8 m (6 feet) approx., Part No. 457297 or equivalent. Two-ply -- recommended paper weight 16 lbs @ 5% (approx. 60 gr/m²) per ply, tape has to be colored through the last 1.8 m (6 feet) approx., Part No. 457298 or equivalent. Field Installation: Available at time of manufacture only.

MICR INSCRIBERS (#5100). This feature consists of two MICR (E18B) inscribing units, one in each transport. It encodes in the same pass, amount, process control, account number and transit routing fields on deposit tickets. All fields are encoded in accordance with the Bank Check Specifications for MICR, ANSI X3.3-1970. Supplies: MICR ribbon Part No. 431555 or equivalent. A MICR gauge is available for checking inscriber output registration. Order part number 451128

Field Installation: Available at time of manufacture only.

SECURITY KEYLOCK (#6350). A key operated switch ... one per 3762. When the key is in the "locked" position, entry of data via a scanner or a keyboard is prevented. Automatic Re-IMI occurs when unlocking. Field Installation: Yes. Note: For additional

and/or replacement keys, see M 10000 pages.

STORAGE EXTENSION (#7500). This feature provides a 8K byte storage extension in the 3762. It must be installed when processing agent transactions ... applying user programmable subroutines ... 1428, OCR-B.095' Standard or 1403 numeric font recognition is required. Only one type font can be recognized in the 3762 at any one time, but different 3762's may recognize different fonts. Maximum: One. Field Installation: Yes.

END

<table>
<thead>
<tr>
<th>ETP/</th>
<th>M 3762.2</th>
<th>Jul 79</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mdl</td>
<td>MAC/ MLC</td>
<td>Purchase</td>
</tr>
<tr>
<td>3762</td>
<td>1</td>
<td>$1,410</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B  Warranty: B  Machine Group: D
Purchase Option: 50%  Useful Life Category: 2
Per Call: 1
Termination Charge Months: 5  Termination Charge Percent: 25%
Upper Limit Percent: 0%

SPECIAL FEATURES

AUDIT TRAIL PRINTERS (#1310). This feature consists of two matrix print devices, one in each transport. It prints a seven by seven dot characters with a pitch of 8.5 characters per inch ... a maximum of 40 print positions on one line. Printing is on the back of the documents starting at 3.0 mm (1.2") from the leading edge, on stubs, checks and deposit tickets, centered 66.5 mm (2.62") from the bottom edge. Fields to be printed on stubs and checks are selected by the user during format definition (not for Deposit Tickets). The character set consists of 10 digits, 26 letters, 7 symbols and blank. Supplies: Cartridge ribbon Part No. 1136970 or equivalent. Field Installation: Available at time of manufacture only.

ENDORSERS (#3805). This feature consists of two endorsing stations, one in each transport. It prints a user designed endorsement legend on the reverse side of the checks. The maximum size of the legend is 28 x 33 mm (1.1 x 1.3"). The user can specify the horizontal endorsement position close to the leading or the trailing edge during format definition. Supplies: Endorse Plates -- for ordering.

Specify: Endorser ink roll -- #9145 for black, #9146 for green, #9147 for purple and #9148 for red. Field Installation: Available at time of manufacture only.

JOURNAL TAPE PRINTERS (#4660). This feature consists of two journal tape print devices, one for each operator. It lists the check amounts processed within a deposit and the deposit total as well as the appropriate deposit identification. When processing agent transactions the individual stub amounts are printed. With the individual amounts, a three digit item identification number is printed in italics in the three leftmost character positions. The two rightmost positions are reserved for a code that identifies the printed line. In total 15 character positions are available. The printed tape is within reach of the operator for tear off at completion of the deposit. Supplies: Ink ribbon -- recommended material Nylon or Vinyon fiber (FF40). Spool diameter 35.1 mm (1.38"). Spool type -- standard only, ribbon width 12.7 mm (.5"), length 6096 mm (240"). Part No. 1299087 (black) or equivalent. Journal Tape -- single or two-ply width 57.2 mm (2.25"), roll diameter 81.0 mm (3 and 3/16") max. Single-ply -- recommended paper weight 16 lbs @ 5% (approx. 60 gr/m²), tape has to be colored through the last 1.8 m (6 feet) approx., Part No. 457297 or equivalent. Two-ply -- recommended paper weight 16 lbs @ 5% (approx. 60 gr/m²) per ply, tape has to be colored through the last 1.8 m (6 feet) approx., Part No. 457298 or equivalent. Field Installation: Available at time of manufacture only.

MICR INSCRIBERS (#5100). This feature consists of two MICR (E18B) inscribing units, one in each transport. It encodes in the same pass, amount, process control, account number and transit routing fields on deposit tickets. All fields are encoded in accordance with the Bank Check Specifications for MICR, ANSI X3.3-1970. Supplies: MICR ribbon Part No. 431555 or equivalent. A MICR gauge is available for checking inscriber output registration. Order part number 451128

Field Installation: Available at time of manufacture only.

SECURITY KEYLOCK (#6350). A key operated switch ... one per 3762. When the key is in the "locked" position, entry of data via a scanner or a keyboard is prevented. Automatic Re-IMI occurs when unlocking. Field Installation: Yes. Note: For additional
IBM 3767 COMMUNICATION TERMINAL

Purpose: A keyboard/printer terminal for transmission of data or text to or from a virtual storage S/370 or 4300 Processor via a 3767 or 3705 Communications Controller, to a 4331 via its Communications Adapter feature, or to the 8100 Information System via the 8130, 8140 and/or 8101. The 3767 uses Synchronous Data Link Control (SDLC) line discipline.

Model 1: 40 cps average bi-directional printer.

Model 2: 80 cps maximum bi-directional printer; includes dual 256 byte line buffers and full buffer editing capability.

Model 3: 120 cps maximum bi-directional printer; includes dual 256 byte line buffers and full buffer edit capability.

NOTE: Throughout all models is dependent upon output format, line control, buffering, and transmission speed.

Highlights: The 3767 consists of control functions, printer, keyboard, control keys and indicator lights in one integrally designed desk-top unit. This configuration allows an operator/machine relationship that is favorable for both interactive and batch operations. Special features are available which permit tailoring of the terminal to the user's requirements.

Control Functions: Provides the control for all on-line and off-line operations, facilitates communications at speeds up to 2400 bps in SDLC line discipline and controls single line data editing on the basic model 1. It also controls, on all models, basic functions such as Automatic Printer: Buffer (E0B/E0M) switch.

Printer: [Model 1 and 2] Maximum printer throughput is obtained with a bi-directional serial matrix printing and indexing without unnecessary print head movement. Electronic tabbing over the full 132 printable positions is provided. The printer dot matrix is 4 of 7 dots by 8 dots giving high legibility with character spacing at 10 to the inch. Line spacing is 6 lines to the inch. Up to 6 part forms (total thickness -- 0.018") may be used. For any multi-part or pre-printed continuous forms, the Variable Width Forms Tractor (#8700) is recommended. Five and six part continuous forms should be tried on an individual basis for acceptable feeding, registration, and print quality. Single part continuous or up to four part cut forms can be used with the standard friction feed platen. The Paper Roll Holder and Forms Guide with paper bail (#9180) is available for use with roll paper and is recommended for use with single part fan-fold paper when the Variable Width Forms Tractor (#8700) is not used. Maximum overall forms width is 15"; card stock forms are not recommended. (See GA24-3488 for form specifications and limitations.)

Printer: [Model 3] Same as model 1 and 2 with the exception that forms tractor is required for all continuous forms.

Keyboard: Provides several keyboard arrangements and includes typamatic on hyphen, underscore, backspace and space keys. In addition to the standard 44 alpha/numeric data keys, a set of control keys, indicator lights, operating mode switches, and a 3-position numeric "print position indicator" display to aid the operator.

Security Enhancement Features: Print Suppress allows selected data fields to be entered without printing. The Security Keylock (optional) with the power switch "ON" allows the 3767 to be operational.

The Magnetic Stripe Reader (optional) is provided to allow operator identification to be transmitted.

Communications Facilities: The 3767 operates in half-duplex mode over facilities C3, C4, C5, D2, D3, D4 or X1M. . . for details concerning these facilities, see M 2700 pages.

Synchronous Data Link Control: Allows for transmission rates of 600, 1200 or 2400 bps.

The 3767 can communicate on a switched or non-switched point-to-point facility as a secondary station on a multipoint or duplex multipoint facility to a virtual storage S/370, a 4300 Processor, or non-switched point-to-point or multipoint on the 8100 Information System.

Modems: One Integrated Modem or External Modem can be used. See “Special Features” for options. Synchronous clock is a standard feature.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the operator. This has been done through the use of problem determination and recovery routines and procedures that are easily understood and used by the operator. See IBM 3767 Operator’s Guide, SRL GA18-2000, and Customer Responsibility below.

Customer Responsibility: The customer is responsible for:

- unpacking, placement, set-up and checkout of the 3767 at time of delivery, or when relocating the 3767,
- removal and packing of the 3767 at time of discontinuance,
- relocation of the 3767 (if required) to allow IBM service access,
- to use and follow the Problem Determination Procedures and fill out the Trouble Report prior to calling for service.

See M 2700 pages for additional responsibilities.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

Supplies: A black ribbon, IBM Part No. 1136653 or equivalent, is required.

For details and prices, see M 10000 pages.

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): $9880 for locking plug, or $9881 for non-lock plug.

[2] Keyboard Arrangement: #9381 for Correspondence, or #9391 for EBCDIC.

[3] SDLC Speed Selection: #9533 for C5/D4 (2400 bps); #9534 for C4/D3 (1200 bps); #9531 for C3, D2 (600 bps). See “Special Features” for modems and modem attachments.

[4] Integrated/External modem cable: A 20 foot cable is provided as standard. If a longer cable is required, specify #9021, indicating length in feet as a quantity of 25, 30, 35 or 40.

[5] 6 Foot Power Cord: Specify #9986, otherwise a 10 foot power cord will be provided.

[6] Variable Width Forms Tractor Covers: Specify #9850 if Variable Width Forms Tractor (#8700) is ordered.

[7] For Model 1 and 2 Only: Paper Roll Holder and Forms Guide with Paper Bail (#9180) must be ordered on all machines without Variable Width Forms Tractor Covers (#9850). A customer using the Variable Width Forms Tractor has the option of ordering specify feature #9180 at no additional charge, once per machine, for friction feeding of single part continuous roll and fan fold paper. Specify feature #9180 is used interchangeably with the Variable Width Forms Tractor and is attached and removed by the customer. The Paper Roll Holder and Forms Guide with Bail is not available for the 3767 mdl 3.

[8] SNA Terminal Address: #9857 must be specified on all orders -- supplemental specs available for giving one EBCDIC byte address. Any two "Hex" characters, excluding "00" and "FF" may be used.

[9] Blower: #9603. Must be specified for 3767 (mdls 1 or 2 only) expected to operate in an environment above 90° F ambient temperature (specification limits up to 105° F).


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ACOUSTIC COUPLER - 600 BPS (#1110). Provides an acoustic coupler for communications through a telephone handset at speeds up to 600 bps. Requires a 1200 bps Integrated Modem on host end of communications facility. Maximum: One. Field Installation: Yes. Customer will set up at time of 3767 delivery. FE will install if ordered. Prerequisites: 1200 bps Integrated Modem (#5502 or #5506), 600 bps (#9531), in addition, if Start/Stop Feature (#7111 or #7113) is ordered, 300 bps (#9540). Note: For limitations on Public Switched Network, consult M 2700.1 page and “Notes for Chart C” note [14] in M 2700 pages.

ASCII FEATURE (#1201). Provides ASCII Keyboard (48 Key) and graphics in lieu of those normally provided by Keyboard Specify Codes. Maximum: One. Field Installation: Not recommended for field installation. Limitations: Cannot be installed with Start/Stop Features (#7111, 7112, 7113), Alternate Character Set (#1291), or Keyboard Arrangement #9381 (Correspondence) or #9391 (EBCDIC). ALTERNATE CHARACTER SET (#1291). Provides a switch control for alternate printed graphics, to those selected by the keyboard specification. Compatible with ASCII feature. Maximum: One. Feature is installed. Field Installation: Yes. Limitations: Cannot be installed with ASCII Feature (#1201).

MODERN 3767 Chart A

<table>
<thead>
<tr>
<th></th>
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</tr>
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<tbody>
<tr>
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<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>(1) Alternate Character Set (#1291) is a prerequisite.</td>
<td>(2) Sub-set of EBCDIC.</td>
<td>(3) Upper case alpha printed from keyboard - upper/lower case may be printed from the communications line.</td>
<td>(4) Upper case alpha printed from keyboard or the communications line regardless of key shift or line code shift.</td>
<td>BUFFER WITH EDIT (#1481, 1482), #1481 [Mdl 1 only] provides two 256 byte buffers for receiving data. #1482 [Mdl 2 or 3] provides two additional 256 byte buffers for receiving data. On key entry these two features provide full buffer (up to 512 or 1,024 bytes) edit capability under key control. With the Edit switch &quot;off&quot;, a single data line may be transmitted. When used with 2741, 3712, Start/Stop Feature (#7112) single buffer (120-248-440 byte) operation is provided. The Buffer Full Alarm warns the operator 10 positions before full capacity. Maximum: One. Each: Feature Installation. Limitation: This feature not active if Start/Stop Feature (#7111 or #7113) is active. A 512 buffer (equivalent to #1481) is standard on 3767mdl 2 and mdl 3. Prerequisite: On model 1, #1482 requires #1481.</td>
<td></td>
</tr>
<tr>
<td>CALCULATE - SCIENTIFIC (#1572). In off-line mode, this feature, under switch control, uses the same keyboard with supplied key-font label) allows the following type calculations to take place: addition, subtraction, multiplication, division, inverse calculation, square root, (including negative standard deviation), exponential, common logarithm, natural logarithm, exponential constant, circular constant and trigonometric functions (sin, cos, tan, arc sin, arc cos, arc tan). Two memories are provided for temporary storage of totals. Sixteen digit input/output is allowed. Maximum: One. Field Installation: Yes.</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIA INTERFACE - NO CLOCK (#3718). Provides one EIA interface for the attachment of an external modem with business machine (3767) clocking. Note: This feature may be used for local attachment to 3704 or 3705 equipped with Line Set Type 1F for operation at 300, 600 or 1200 bps. If this feature is to be used with a 1F line set, specify #9404. Feature: #9402 for half duplex facility, or #9404 for full duplex facility...</td>
<td>face for the attachment of an IBM 3863, 3872 or other external modem, with modem clocking (3767 clock disabled). Specify: #9404 for half duplex facility (combined modem and line) ... #9707 for attaching IBM 3872 Modem...</td>
<td>1200 (SDLC) BPS INTEGRATED MODEM (#5500). Non-switched. A modem for operation at 300, 600, or 1200 bps over full non-switched voice grade channels. Specify: #9402 for 2-wire communications facilities, #9404 for 4-wire facilities. Maximum: One. Field Installation: Yes. Limitations: Cannot be ordered with 1200 bps Integrated Modem (5502, 5505, or 5506). Feature is #7112, the communication facilities must be full duplex. Prerequisites: #9404 for full duplex, or #9402 for half duplex facility, or #9404 for full duplex facility...</td>
<td>1200 (SDLC) BPS INTEGRATED MODEM (#5502). Switched. A manual answer modem for operation at 300, 600 or 1200 bps over Public Switched Telephone Networks. This modem includes a bi-directional reverse channel capability. This interrupt signal is transmitted when the ATTN key on the 3767 keyboard is depressed. Note: This feature moderm is required to transmit or receive an interrupt only with Start/Stop #7113 (SDLC) only operating at 300 bps in Start/Stop mode on a half-duplex non-switched channel and the EIA Interface (SDLC) is not used. Line Set Type 3D on the 3704 and 3704 Type 12B on the 3705 is required to support this feature. Maximum: One. Field Installation: Yes. Limitations: Cannot be installed with an EIA Interface (#3718 or #3719) or 1200 bps Integrated Modem (5502, 5505 or 5506). Prerequisites: #9532 for C4 (1200 bps) or #9531 for C3 (600 bps). If Start/Stop Feature is installed, that feature’s line speed is specified.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200 BPS INTEGRATED MODEM INTERRUPT (#5505). [Mdl 1 and 2 only] Non-switched. A modem for operation at 300 (Start/Stop), 600 or 1200 (SDLC) bps over 2-wire non-switched voice grade channels. This modem includes a bi-directional reverse channel capability. This interrupt signal is transmitted when the ATTN key on the 3767 keyboard is depressed. Note: This feature moderm is required to transmit or receive an interrupt only with Start/Stop #7271 (1200 bps) only operating at 300 bps in Start/Stop mode on a half-duplex non-switched channel and the EIA Interface (SDLC) is not used. Line Set Type 3D on the 3704 and 3704 Type 12A on the 3705 is required to support this feature. Maximum: One. Field Installation: Yes. Limitations: Cannot be installed with an EIA Interface (#3718 or #3719) or 1200 bps Integrated Modem (5500, 5502 or 5506). Prerequisites: #9532 for C4 (1200 bps) or #9531 for C3 (600 bps). If Start/Stop Feature is installed, that feature’s line speed is specified. Note: This feature requires either Acoustic Coupler - 600 bps (#1110) or a CDT type Data Access Arrangement or equivalent.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1200 BPS INTEGRATED MODEM INTERRUPT (#5506). [Mdl 1 and 2 only] Switched. A manual answer modem for operation at 300 (Start/Stop), 600 or 1200 (SDLC) bps over Public Switched Telephone Networks. This modem includes a bi-directional reverse channel capability. This interrupt signal is transmitted when the ATTN key on the 3767 keyboard is depressed. Note: This feature moderm is required to transmit or receive an interrupt only with Start/Stop #7271 (1200 bps) only operating at 300 bps in Start/Stop mode on a half-duplex switched channel and EIA Interface (#3718) is not used. Line Set Type 8D on the 3704 and 3704 Type 12B on the 3705 is required to support this feature. Maximum: One. Field Installation: Yes. Limitations: Cannot be

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SECURITY KEYLOCK (#6600). Provides a key operated switch. When in the "locked" position, machine operations cannot be performed. Two keys are provided. For additional or replacement keys, see "Locks and Keys" in M 10000 pages. Maximum: One.

START/STOP FEATURE (#7111, 7112, 7113). These features provide a Type I Start/Stop line control migration aid on the 3767 to allow operation with existing program support (see Programming Section). The feature allows transmission to or from a Virtual Storage S/370 mdl 115 thru 165MP or a 3031 or 4300 Processor via a 3704 or 3705 at 300 bps (2740-1 or 2741 Line Control) or at 600, 1200, or 2400 bps (2740-2 Line Control) or via a 2701 at 2700 bps (2740-2 Line Control). It also allows transmission, via communications facility to or from a 3115, 3125 ICA, 3135 ICA, or 3138 ICA at 300 bps (2740-1 Line Control) or at 600 bps (2740-2 Line Control). 1200 bps (2740-2 Line Control) also supported by 3115 ICA and 3125 ICA. It allows communications via a 3704/3705 Communications Controller attached to a channel of a S/370 mdl 30, 40, 50, 55, 65, 67 (in 65 mode), 75 and 195 at 300 bps (2740-1 or 2741 Line Control) or at 600, 1200, or 2400 bps (2740-2 Line Control); via a 2701 attached to a channel of a S/370 mdl 22, 25, 30, 40, 44, 50, 55, 67 (in 65 mode), 75 and 195; or a S/370 mdl 155, 165, 195, or any 4300 Processor, at 600 bps (2740-2 Line Control); or via an Integrated Communications Attachment on S/370 mdl 25 at 600 bps (2740-2 Line Control). Attachment is also possible via the Communications Adapter feature on the 4301, see 4301 for details. An SDLC/Start/Stop switch is provided to allow operation in either mode. Communications facility must be specified for this feature. Maximum: One. Field installation: Yes. Limitation: Cannot be installed with ASCII Feature (#1201).

Select One: #7111 -- 2740-1 Line Control [Mdl 1 or 2 only] Specify: #9540 for C1/D1 (300 bps). Note: For multipoint -- specify #9560 (Station Control) and see "Terminal and Group Addresses" (below) for additional information to be specified. Notes: On given non-switched line, one terminal within each group and one terminal for the entire line (All Call) must provide the necessary checking and addressing responses for that group and/or for the entire line. Specify #9197 for a group responding and/or #9035 for an All Call responding terminal. Limitations: Group or All Call addressing requires duplex communications facilities. Non-switched facility required for SDLC if Station Control (#9580) is specified. Cannot be installed with 2400 bps (#9553 or El) Addressing. No Clock (#3718).

#7112 -- 2740-2 Line Control [Mdl 1, 2 or 3] Buffer Receive mode is standard operation. Limitations: Group or All Call addressing requires duplex communications facilities. If multiplexed on the same communications line with 2740-2s the 3767 must not be designated as the Group or All Call Responding terminal. Non-switched facility required for SDLC with this feature installed. Cannot be installed with Correspondence Keyboard (#9381). Specify: See "Terminal and Group Addresses" (below) for additional information to be specified. Notes: On a given non-switched line, one terminal within each group and one terminal for the entire line (All Call) must provide the necessary checking and addressing responses for that group and/or for the entire line. Specify #9197 for a group responding and/or #9035 for an All Call responding terminal. Specify Line Speed -- #9541 for D2 (600 bps) or #9542 for D3 (1200 bps). Buffer Positions - #9015 for 120, #9016 for 248, or #9017 for 440. Note: This specified feature has no effect on buffer size under SDLC line discipline. Prerequisite: On model 1, Buffer with Edit (#1481 or #1482).

#7113 -- 2741 Line Control [Mdl 1 or 2 only] Specify: #9540 for C1/D1 (300 bps). Limitations: Cannot be installed with 2400 bps (#9533) or EIA Interface - No Clock (#3718). Note: See "Terminal Identification" (below) for additional information to be specified. The 2741 Transmit and Receive Interrupt function on the 3767 with #7113 (2741 Line Control) is supported via the following:

Table:
<table>
<thead>
<tr>
<th>1200 bps Intg'd Mode</th>
<th>External Modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sw'd Non-Switched</td>
<td>Sw'd Non-Switched</td>
</tr>
<tr>
<td>2-wire</td>
<td>2-wire</td>
</tr>
<tr>
<td>3704</td>
<td>#4786</td>
</tr>
<tr>
<td>3115</td>
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<td>3135</td>
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<tr>
<td>8140</td>
<td>---</td>
</tr>
<tr>
<td>8101</td>
<td>---</td>
</tr>
</tbody>
</table>

(1) Modem must be full duplex.

Terminal and Group Addresses

Terminal and group addresses must be selected when one of the following Start/Stop Features is ordered: #7111 for 2740 mdl 1 Line Control with Station Control (#9560) specified and/or #7112 for 2740 mdl 2 Line Control.

For Terminal Address and Group Address, a two-character code must be selected as described below. The first character must be the Terminal Address, and the second character must be the Group Address. (The same character may be ordered for both addresses. However, in this case, the terminal will be wired at the factory as a Group Responding #9197 terminal.)

With EBCDIC Keyboard Assignment (#9391), select characters from:
A thru Z, 0 thru 9, and special characters @ (at sign) ... $ (dollar sign) ... & (ampersand) ... (at sign) ... (period) ... (period).

With Correspondence Keyboard Assignment (#9381), select characters from:
A thru Z (except B and X), 0 thru 9, and special characters = (equal) ... / (slash) ... ; (semi-colon) ... , (comma) ... (period) ... (apostrophe) ... (hyphen).

Not available with #7112.

If Alternate Character Set (#1291) is installed on the terminal, the Terminal and Group Address line code bit configuration remains with the same for either switch setting.

Specify: #9644 (Terminal and Group Addresses) and enter the two-character code as Supplemental Spec based on the permissible characters listed above.

Terminal Identification

If Terminal Identification is used in the customers application (provided by RPQ), Auto Address Answer-back on the 2741, a four-character Terminal Identification must be selected when Start/Stop Feature - 2741 Line Control (#7113) and one of the following are ordered: #8502, #5506, or #3719 with #9619 (switched line operation) specified.

Depending on the Keyboard Assignment specified on the base machine, the following characters may be selected for the Terminal Identification code.

With EBCDIC Keyboard Assignment (#9391), select characters from:
A thru Z, 0 thru 9, and special characters = (number sign) ... / (slash) ... $ (dollar sign) ... & (ampersand) ... (at sign) ... (comma) ... (period) ... (hyphen) ... C/R (carrier return) space.

With Correspondence Keyboard Assignment (#9381), select characters from:
A thru Z, 0 thru 9, and special characters = (equal) ... / (slash) ... (apostrophe) ... (hyphen) ... C/R (carrier return) space.
The same character may be selected for all four positions except C/R may only be used in the fourth position.

If Alternate Character Set (#1291) is installed on the terminal, the Terminal ID line code bit configuration remains the same for either switch setting.

Specify: #9645 (Terminal Identification) and enter the four-character code based on the above permissible characters. NOTE: For "space" character, enter %. For C/R character, enter • (available in fourth position only).

**VARIABLE WIDTH FORMS TRACTOR (#8700).** A forms feeding device for continuous edge-punched forms. Overall forms width from 3 to 15 inches can be fed. **Prerequisites:** Variable Width Forms Tractor Covers (#3850).

**VERTICAL FORMS CONTROL (#8731).** Allows vertical forms skipping to a pre-set page header location or a pre-set vertical tab position. Page size, header location and vertical tab stops are entered from the keyboard or received from the host under SDLC line control. **Maximum:** One. **Field Installation:** Yes. **Prerequisites:** Variable Width Forms Tractor Covers (#3850) and Variable Width Forms Tractor (#3700). **Limitation:** This feature (#8731) is non-functional in Start/Stop (#7111, #7112, #7113) mode.

**Special Feature Prices:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Model 1 Only</th>
<th>Model 1 and 2 Only</th>
<th>Model 1, 2 and 3</th>
</tr>
</thead>
</table>
| Buffer with Edit | #1481 $ 24 $ 20 $ 700 $1.00 | For Start/Stop Feature -
| Start/Stop Feature -
| 2740-1 Line Control | 7111 6 5 175 .50 | 2741 Line Control 7113 6 5 175 .50 |
| 1200 bps Integrated Modem w Interrupt -
| Non-switched | 5505 31 26 1,185 10.00 | Switched 5506 31 26 1,185 10.00 |
| Acoustic Coupler-600 bps | 1110 14 12 420 .50 | Acoustic Coupler | 1201 12 10 350 .50 |
| ASCII Feature | 1201 12 10 350 .50 | ASCII Feature | 1201 12 10 350 .50 |
| Buffer w Edit - 1,024 | 1482 24 20 700 .50 | Buffer w Edit | 1,024 24 20 700 .50 |
| Calculate - Scientific | 1572 19 16 580 1.00 | Calculate - Scientific | 1572 19 16 580 1.00 |
| EIA Interface-No Clock | 3718 13 11 385 1.00 | EIA Interface-No Clock | 3718 13 11 385 1.00 |
| EIA Interface-w Clock | 3719 13 11 385 1.00 | EIA Interface-w Clock | 3719 13 11 385 1.00 |
| Magnetic Stripe Reader | 4930 19 16 560 1.50 | Magnetic Stripe Reader | 4930 19 16 560 1.50 |
| 1200 bps Integrated Modem -
| Non-switched | 5500 19 16 668 4.00 | 1200 bps Integrated Modem -
| Switched | 5500 19 16 668 4.00 | Switched | 5500 19 16 668 4.00 |
| 1200 bps Integrated Modem | 5500 19 16 668 4.00 | 1200 bps Integrated Modem | 5500 19 16 668 4.00 |
| 1200 bps Integrated Modem | 5500 19 16 668 4.00 | 1200 bps Integrated Modem | 5500 19 16 668 4.00 |
| Sw w Manual Ans | 5502 19 16 688 4.00 | Sw w Manual Ans | 5502 19 16 688 4.00 |
| Security Keylock | 6650 35NC --- 35 NC | Security Keylock | 6650 35NC --- 35 NC |
| Start/Stop Feature -
| 2740-2 Line Control | 7112 6 5 175 .50 | Platform Line Control 2740-2 Line Control 7112 6 5 175 .50 |
| Var Width Forms Tractor | 8700 6 5 180 .50 | Var Width Forms Tractor | 8700 6 5 180 .50 |
| Vertical Forms Control | 8731 13 11 385 .50 | Vertical Forms Control | 8731 13 11 385 .50 |

**Accessories:** The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 pages for additional information and field installation.

**FORMS STAND (#4450)** — Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

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IBM 3771 COMMUNICATION TERMINAL

Purpose: This desk-style console-keyboard-printer is a member of the 3770 Data Communication System. Communication features permit operation over switched or non-switched facilities at speeds up to 4800 bps, using SDLC or BSC transmission techniques. Special features permit the attachment of one card reader or card punch operating at 50 cpm. The card punch can optionally be equipped with a special feature for Card Read to permit single path card reading or card punching.

Model 1: 40 cps average print rate — bi-directional
Model 2: 80 cps maximum — bi-directional
Model 3: 120 cps maximum — bi-directional

Highlights:
- Keyboard — EBCDIC arrangement with 44 data keys (produces 88 characters). Underscore/Hyphen, Backspace, Space, and "Print Character" keys have typamatic operation. Associated with the keyboard are indicator lights, function keys, operating mode switches, and a 3-position numeric display.
- Printer — prints serial by character while the wire-matrix print head is moving in either direction — bi-directional printing. Print span is 132 positions at 10 characters per inch. Line spacing is 6 lines per inch. Single part continuous forms or up to three part cut forms can be handled with the standard friction feed platen. A variable width forms tractor, available as a special feature, is required for feeding multipart or preprinted continuous forms of up to six parts maximum (total thickness not greater than 0.018"). Five and six part continuous forms should be tried on an individual basis for acceptable feeding, registration and print quality. Overall forms widths from 3" to 15" can be accommodated up to 190 cps, to facilitate hands forms, the Forms Stand (special feature) is recommended. Card stock continuous forms are not recommended. Refer to GA24-3485 for forms design considerations. A 94 character set is standard.
- Dual 256-Byte Buffers — transfer data between the input and output devices. The buffers alternate in providing input and output service to permit overlapped operation.
- Buffer Edit — allows corrections to be made on the contents of a buffer during key entry jobs. Corrections can be made by character, by line, or by entire buffer (up to 256 bytes).
- Extend Buffer — combines the dual 256-byte buffers into a single 512-byte buffer under operator control for keyboard to line jobs. Buffer edit capability applies to the full 512 bytes. Buffer transfers to line are in 256-byte increments and cannot be overlapped.

Printer Format Controls — facilitate the formatting of printed data. Vertical and horizontal control characters in data initiate vertical or horizontal tabbing. Format controls can be entered from keyboard, or from an attached card reader or by entire buffer (up to 256 bytes).

Compression/Expansion — provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from cards. A two-byte sequence is substituted for each occurrence of three or more consecutive blank card columns (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 63 consecutive blank columns are read. The terminal monitors received non-transparent data that is destined for printer or attached card punch and automatically expands this two-byte sequence to the correct number of blanks. A similar capability is provided when using SDLC procedures.

Input/Output Selection — is under control of keyboard setup with an option for entering one set of printer format controls from the keyboard or the card reader. A fully configured 3771 will allow the following:

**Output to printer is automatic.**
"Monitor Print is an output option in addition to line or card punch."

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through use of problem identification and recovery routines and procedures that are easily understood and used by the operator. See IBM 3771/3773 Operating Procedures Guide, GA27-3100.

Communications: See "Special Features." Transmission speeds up to 4800 bps over switched or non-switched facilities are allowed by selecting the appropriate modem and communication facility. Refer to 3770 Data Communication System in "Systems" for a Communication Configurator. Refer to M 2700 pages for information on communication facilities, and other attachment information. Also refer to S863, S864, 3872 and 3874 in "Machines."

Supplies: A black ribbon, IBM Part No. 1136653, or equivalent, is required.

Customer Responsibilities: It will be a customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Limitations: The input/output capabilities under "Highlights" are dependent on appropriate configurations of the terminal. Keyboard and console printer are standard. For other configurations, refer to "Special Features" below.

Prerequisites:
For SDLC Communications with S/370 or 4300 Processors — a 3704 or 3705 Communications Controller operating under Network Control Program (TCP/IP) and attached to any virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2, or these operating systems running under VM/370. Note: OS/VS2 is not supported on the 4300 Processors. The 3770 Communication Terminals use 2770 BSC programming support when operating in BSC mode. Operation with S/360, S/370 and 4300 Processors using 2770 BSC programming is also permitted. See SRL GA27-3097 for BSC compatibility considerations. The customer may have to modify existing 2770 application programs for operation with 3770. BSC attachment can be made via a 3704/3705 Communications Controller or a 2701 Data Adapter Unit attached to a channel of any S/370 or 4300 Processor, via an Integrated Communications Adapter on S/370 md1 115, 125 or 135 or via the Communications Adapter feature on a 4331. BSC attachment can be made via a 3704/3705 Communications Controller attached to a channel of a S/360 md1 30, 40, 50, 65, 67 (in 65 mode) 75 and 195; via a 2701 attached to a channel of a S/360 md1 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode), 75 and 195; or via an Integrated Communications Attachment on S/360 md1 25.

Bibliography: GC20-0001.

[2] Color: $9041 for red, $9042 for yellow, $9043 for blue, $9045 for gray. Note: Available at time of manufacture only.

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**Table:**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
<th>Description</th>
</tr>
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<tbody>
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<td>$195</td>
</tr>
<tr>
<td>2</td>
<td>259</td>
<td>220</td>
</tr>
<tr>
<td>3</td>
<td>306</td>
<td>260</td>
</tr>
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**ETP (Estimated Time for Production):**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MAC/ MLC</th>
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<tr>
<td>3771</td>
<td>$8,400</td>
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<tr>
<td>2</td>
<td>6,800</td>
</tr>
<tr>
<td>3</td>
<td>10,400</td>
</tr>
</tbody>
</table>

**Plan Offering:**

- Plan B: Machine Group: D
- Per Call: 1
- Purchase Option: 45% Warranty: B
- Useful Life Category: 2
- Termination Chg Mths: 5
- Termination Chg Percent: 25% Upper Limit Percent: 0%

**Model Changes:**
Model 1 to Model 2 $700
Model 1 to Model 3 $2,500
Model 2 to Model 3 $2,300

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For Communication Capability — select one Communication Feature (#1460, 1461 or 1470); one Communication Driver (#1481 or 1482) ... and one Integrated Modem (#5500, 5501, or 5502) or EIA Interface (#3701). #1462 is required in addition to #1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE ... one can be selected.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communication procedures to SDLC or BSC under operator switch control. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. Maximum: One. Limitation: Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. Maximum: One. Limitation: Cannot be installed with #1460 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC procedures. Maximum: One. Limitation: Cannot be installed with #1460 or #1470. For record purposes also identify CPU/Program Environment code. Specify one of the following: #9977 for EIA Interface or Integrated Modem. This feature in combination with #1481 can be used to attach to Modem Fan-out One. This feature in combination with #1482 can be used for non-IBM on an adjacent terminal. Prerequisite: Communication Feature with #1481. Limitation: Cannot be installed with #1470. Limitation keys. Maximum: One. Limitation: Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

EIA INTERFACE (#3701). Provides a cable and interface meeting RS-232C characteristics for attachment of an IBM Modem or non-IBM modem. Speeds up to 4800 bps for switched or non-switched operation are permitted. This feature in combination with #1461 can be used to attach to Modem Fan-out (#3901) on an adjacent terminal, or on an IBM 363, 364, 3872 or 3874 modem. This feature in combination with #1481 can be used for direct attachment to a 3704 or 3705 equipped with Local Attachment (#4716) for operation at 1200 bps synchronous. Maximum: One. Prerequisite: Communication Driver (#1481 or 1482). Limitation: Cannot be installed with any integrated Modem feature.

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides for point-to-point or multipoint operation over non-switched communication facilities. Maximum: One. Prerequisite: Communication Driver with Clocking (#1482). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5501). Provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. Maximum: One. Prerequisite: Communication Driver (#1482). The user must provide a Data Coupler type CBS or equivalent. Limitation: Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANSWER (#5502). Provides for point-to-point operation over switched networks using manual originate/manual answer for establishing connection. Maximum: One. Prerequisite: Communication Driver (#1482). The user must provide a Data Coupler type CDT or equivalent. Limitation: Cannot be installed with #3701, or with another Integrated Modem.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with BSC features #1460, #1461 or #1462, or with SDLC features #1460 or #1470. Maximum: One. Field Installation: Not recommended for field installation.

AUDIBLE ALARM (#1390). Sounds an alarm to alert the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. Maximum: One.

KEYLOCK (#4650). Provides a mechanical keylock to override controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with this feature. Refer to M 10000 pages for information on additional or replacement keys. Maximum: One.

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read.

With BSC, a read operation can be initiated during a keyboard to line job only. Data read from the magnetic stripe card cannot be printed. Maximum: One. Limitations: (1) The operator must position and slide the card through the reader-slot at a steady rate between 5" and 40" per second for a read operation. (2) BSC programming for 2770 does not support this feature.


3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit ml and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. Maximum: One. Limitation: Cannot be installed with #8050.


Special Feature Prices:

<table>
<thead>
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<th>Feature</th>
<th>ETP/MAC</th>
<th>MRC</th>
<th>2Yr</th>
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ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

Forms Stand (#4450) — Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

Not to be reproduced without written permission.
Purpose: This desk style console-keyboard printer includes as standard a diskette storage device with removable, reusable diskette. It is a member of the 3770 Data Communication System. Communication features permit operation over switched or non-switched facilities at speeds up to 4800 bps. It uses the SDLC or BSC transmission technique.

Model 1, P1 40 cps average print rate - bi-directional
Model 2, P2 60 cps maximum - bi-directional
Model 3, P3 120 cps maximum - bi-directional

The prefix ‘P’ on the model number designates user-programmable.

Specify: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): $9880 for locking plug, or $9881 for non-lock plug.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.
[3] Remote Power Off: #9501 ... specify this feature for capability to power down terminal from the host CPU using a controlled data sequence over communication facilities.


Alternate Address: #9011 ... for EC record purposes only. Order this additional feature to specify that diskette containing terminal control code engineering changes are to be mailed to an alternate address number using a Teleprocessing Control number. The alternate address position is usually the central site location. Limitation: For models P1, P2, P3 only. Field installable.

PRICES: Md1 MRC MAC/ MLC ETP/ 2-Yr Purchase MMC terminates
3773 1 ... $311 $265 $11,200 $74.50
2 ... 241 290 $11,600 78.50
3 ... 308 330 $13,200 102.00
P1 ... 370 315 $13,200 113.00
P2 ... 350 323 $13,600 117.00
P3 ... 419 357 $14,280 132.00

Plan Offering: Plan B Machine Group: D Per Call: 1 Warranty: B Purchase Option: 50%
Termination Chg Mths: 5 Termination Chg Percent: 25%
Upper Limit Percent: 0% Useful Life Category: 2

Model Changes: Field Installable on an ‘As Available’ basis.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

Model 1 to Model 2 ... $700
Model 1 to Model 3 ... 2,500
Model 1 to Model P1 ... 4,400
Model 1 to Model P2 ... 5,100
Model 1 to Model P3 ... 6,700
Model 2 to Model 3 ... 2,300
Model 2 to Model P2 ... 4,400
Model 2 to Model P3 ... 6,000
Model 3 to Model P1 ... 4,400
Model P1 to Model P2 ... 700
Model P1 to Model P3 ... 2,300
Model P2 to Model P3 ... 1,360

SPECIAL FEATURES
All special features can be field installed, except #1201 and #4460 for which field installation is not recommended. Special features are on an ‘As Available’ basis for field installation.

For Communication Capability -- select one Communication Feature (#1460, 1461 or 1470) ... one Communication Driver (#1481 or 1482) ... and one Integrated Modem (#5500, 5501, 5502) or EIA Interface (#3601). #1462 is required in addition to #1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE ... one can be selected.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communication procedure using SDLC or BSC under operator switch control. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. Maximum: One. Limitation: Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. Maximum: One. Limitation: Cannot be installed with #1460 or #1470.

See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC procedures. Maximum: One. Limitation: Cannot be installed with #1460 or #1461. Also identifies the primary CPU/Program Environment code. Specify one of the following: #9977 or #9988 for OS/VS VTAM, or #9997 for OS/VS VTAM, or #9993 for all other combinations of operating systems and access methods.

BSC MULTIPONT (#1462). Required for BSC multipoint operation over non-switched facilities. Maximum: One. Prerequisite: #1460 or #1461. Limitation: See SRL GA27-3097 for BSC compatibility considerations.

COMMUNICATION DRIVER ... one can be selected.

WITHOUT BUSINESS MACHINE CLOCKING (#1461). Provides a communication driver without clocking. Maximum: One. Prerequisite: Communication Feature #1460, #1461 or #1470. Limitation: Cannot be installed with any other Communication Driver.

WITH 1200 BPS BUSINESS MACHINE CLOCKING (#1462). Provides a communication driver with 1200 bps clocking. Maximum: One. Prerequisite: Communication Feature #1460, #1461 or #1470. Limitation: Cannot be installed with #1481.

EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

EIA INTERFACE (#3701). Provides a cable and interface meeting RS-232C characteristics for attachment of an IBM Modem or non-modem device. Provides for point-to-point or non-switched operation are permitted. This feature in combination with #1481 can be used to attach to Modem Fanout (#3901) on an adjacent terminal, or on another IBM Modem or Modem 3774 or 3784 Modem. This feature in conjunction with #1482 can be used for direct attachment to a 3704 or 3705 equipped with Local Attachment (#4716) for operation at 1200 bps synchronous. Maximum: One. Prerequisite: Communication Driver (#1481 or 1482). Limitation: Cannot be installed with any Integrated Modem feature.

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides for point-to-point or multipoint operation over non-switched communication facilities. Maximum: One. Prerequisite: Communication Driver with Clock (#1482). Limitation: Cannot be installed with #3701 or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5501). Provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. Maximum: One. Prerequisite: Communication Driver (#1482). The user must provide a Data Coupler Type CBS or equivalent. Limitation: Cannot be installed with #3701 or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANSWER (#5502). Provides for point-to-point operation over switched network facilities using manual originate/manual answer for establishing connection. Maximum: One. Prerequisite: Communication Driver (#1482). The user must provide a Data Coupler Type CDT or equivalent. Limitation: Cannot be installed with #3701 or with another Integrated Modem.

ASCII FEATURE (#1201). A 48 data keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. The feature also provides for operation with diskette storage and with BSC features #1460, #1461 or #1462, or with SDLC features #1460 or #1470. Maximum: One. Field Installation: Not recommended.

AUDIBLE ALARM (#1390). Sounds an alarm to alert the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. Maximum: One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. Maximum: One. Limitation: The keys provided with this lock can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

KEYLOCK (#4600). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with this feature. Refer to M 10000 pages for information on additional or replacement keys. Maximum: One.

KEYPAD, NUMERIC (#4600). Provides a keypad in adding machine arrangement to facilitate rapid entry of numeric only data. Maximum: One. Prerequisite: Model P1, P2, P3. Limitation: Not available for models 1, 2 or 3. Field Installation: Not recommended.

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards. ABA encoded in the IBM 6220 format for reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read.
With a non-programmable terminal, a read operation can be initiated during a keyboard to line job only. Data read from the magnetic stripe card cannot be printed. For a programmable terminal the Operator ID Reader (#5450) is under control of the 3770 application program. Maximum: One. Limitation: (1) The operator must position and slide the card through the reader-slot at a steady rate between 5" and 40" per second for a read operation ... (2) BSC programming for 2770 does not support this feature.

**STORAGE INCREMENT, 4K (#6800).** Provides an additional 4096 bytes of programmable storage. Maximum: One. Prerequisite: Model P1, P2 or P3. Limitation: Not available for mdls 1, 2 or 3, or with #6801.

**STORAGE INCREMENT, 8K (#6801).** Provides an additional 8192 bytes of programmable storage. Maximum: One. Prerequisite: Model P1, P2 or P3. Limitation: Not available for mdls 1, 2 or 3, or with #6800.

**VARIABLE WIDTH FORMS TRACTOR (#8700).** Provides a forms feeding device for continuous edge-punched forms. Overall forms widths from 3" to 15" can be feed. Refer to Forms Design Reference Guide for Printers, GA24-3488. Maximum: One.

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**Special Feature Prices:**

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<thead>
<tr>
<th>Feature</th>
<th>ETP/</th>
<th>MAC</th>
<th>MLC</th>
<th>MRC</th>
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*Customers who elect to purchase this feature and anticipate later ordering additional storage, should consider purchase of the larger storage initially because a field upgrade requires replacement of the initial feature.

**ACCESSORIES:** The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed on M 10000 pages. See M 10000 for additional information and field installation.

**Forms Stand (#4450).** — Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.
Purpose: This desk-style console-printer-keyboard is a member of the 3770 Data Communication System. The basic printer operates at a maximum speed of 80 5/6 characters per second, and prints bi-directional, serial by character, using a wire-matrix print head. Special features permit one or two diskette storage devices and provide for the addition of an additional printer, the 3784 Line Printer, and one card reader and one card punch. One of three card readers can be selected for operation at speeds of 50, 150 or 300 cards per minute. The card punch operates at 50 cpm.

Communication features allow for operation over switched or non-switched facilities at speeds up to 4800 bps using SDLC or BSC transmission techniques and an appropriate modem.

Model 1, P1
80 cps maximum — bi-directional printer
Model 2, P2
120 cps maximum — bi-directional printer

The prefix "P" on the model number designates user-programmable.

Highlights:

- **All Models**
  - **Keyboard** — EBCDIC arrangement with 44 data keys (produces 88 characters). Underscore/Hyphen, Backspace, Space and "Print Character" ("Character," "alphanumeric," or "user-defined") are all programmable. The keys have typamatic operation. Associated with the keyboard are indicator lights, function keys, operating mode switches, and a 3-position numeric display.
  - **Printer** — prints serial by character at a maximum rate of 80 or 120 characters per second while the wire-matrix print head is moving in either direction — bi-directional printing. Print span is 135 positions at 10 characters per inch. Line spacing is 6 lines per inch. The 3774 mdls P1 and P2 (without Emulator) provide for line spacing of 6 or 8 lines per inch. Single part continuous forms or up to three part cut forms can be handled with the standard friction feed platen. A variable width forms tractor (an accessory) is recommended. Card stock continuous forms are not recommended. Refer to GA24-3486 for forms design considerations. A 94 character set is standard.
  - **Performance Considerations** — actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communications facilities, transmission block length, compressing characteristics, characters read/printed, forms skipping, application processing, etc., must all be considered in determining actual throughput. See "3770 Data Communication System, GA27-3097," for additional information.

- **Problem Determination Procedures** — significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem identification and recovery routines and procedures that are easily understood and used by the customer. See IBM 3774 Operating Procedures Guide, GA27-3094, or IBM 3773, 3774 and 3775 Programmable Communication Terminals Operator's Guide, GA27-3114.

- **Communications** — see "Special Features." Transmission speeds up to 4800 bps over switched or non-switched facilities are allowed by selecting the appropriate modem and communication facility. Refer to 3770 Data Communications System in "Systems" for a Communication Configurator. Refer to M 2700 pages for information on communications facilities and other attachment provisions. Also refer to 3782 and 3784 in "Machines." The 2400 BPS Integrated Modem and IBM 3872 Modem when appropriately configured can be internexed on the same communication facility.

- **Supplies** — a black ribbon, IBM Part No. 2236653, or equivalent, is required.

- **Customer Responsibilities** — it will be the customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Prerequisites:

- **For SDLC Communications with S/370 or 4300 Processors** — a 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or these operating systems running under VM/370. Note: OS/VS2 is not supported by the 4300 Processors.

For BSC Communications with S/360, S/370 or 4300 Processors — a virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or under RSCS (non-programmable terminals only) and VM/370; or any of these operating systems running under VM/370. Note: OS/VS2 is not supported by the 4300 Processors. The 3776 Communication Terminals use 2770/3760 BSC programming support when operating in BSC mode. See SRL GA27-3097 for BSC responsibility considerations. The customer may have to modify existing 2770/3780 application programs for operation with 3774. The customer will have to modify existing application programs for operation with programmable models. See S/360 BSC 3774 and 3775 SDLC Communications Controller, or a 2701 Data Adapter Unit attached to an EBCDIC 3774 BSC System, GA27-3097. BSC attachment can be made via a 3704/3705 Communications Controller, or a 2701 Data Adapter Unit attached to a channel of any S/370 or 4300 Processor, or via an Integrated Communications Adapter on S/360 modl 115, 125, 135, 135-3 or 138; or via a Communications Adapter feature on the 4331 Processor. BSC attachment can be made via a 3704/3705 attached to a channel of a S/360 mdls 30, 40, 50, 65, 67 (in 65 mode), 75 or 195; via a 2701 attached to a channel of a S/360 mdls 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode), 75 or 195, or via an Integrated Communications Attachment on S/360 modl 25.

Non-programmable Models and Programmable Models with Emulator Specify Feature

- **Dual 256-Byte Buffers** — transfer data between the input and output devices alternately in input and output service to permit overlapped operation.

- **Buffer Edit** — allows corrections to be made on the contents of a buffer during key entry jobs. A 256-byte diskette record, if the diskette feature is present, can be used with the buffer using Update Mode and be corrected using buffer edit functions. Corrections can be made by character, by line or by entire buffer (up to 256 bytes). The buffer can be read in or out of the printer.

- **Extend Buffer** combines the dual 256-byte buffers into a single 512-byte buffer under operator control for keyboard or diskette data. Buffer edit capability applies to the full 512 bytes. Buffer transfers to or from diskette are in 256-byte increments and cannot be overlapped.

- **Printer Format Controls** — facilitate the formatting of printed data. Vertical and horizontal control characters in data initiate vertical or horizontal formatting. Data can be placed on the line in one of many arrangements. A second buffer can be used for transmitting data under control of the operator. (For 3774 BSC 2701, 3774 BSC 2704 and 3701 see "Special Features." Buffer transfers to or from diskette or card are regulated by use of the control functions.

- **Compression/Extension** provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from cards. A two-byte sequence is substituted for each occurrence of three or more consecutive blank card columns (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 64 consecutive blank card columns are read. The terminal monitors recorded non-transparent data that is destined for printer or attached card punch and automatically expands this two-byte sequence to the correct number of blanks. A similar capability is provided when using SDLC procedures.

- **Auto Interrupt** — allows the terminal to automatically interrupt an offline job for an online job initiated by the host CPU. The terminal checks the offline job for receiving and processing an interrupt command. If the receiving line data, automatically restarts the offline job without operator intervention. A manual switch on the keyboard enables/disables this mode of operation. See "Operating Characteristics — Automatic Interrupt" in 3770 Systems Components Manual, GA27-3097.

Input/Output Job Definitions — can be operator or terminal defined. Up to five operator defined jobs can be read from diskette or card reader to facilitate rapid job set-up when the terminal is equipped with either of the special features; otherwise they can be entered from keyboard under control of a prompting sequence and executed from temporary storage. Printer format controls can be part of the job definition. An appropriately configured 3774 will permit input/output job designations as follows:

- **Offline Jobs**
  - **Input**
    - **Keyboard**
      - (1) Diskette or Card Reader
      - (2) Keyboard & Diskette
  - **Output**
    - **Keyboard**
      - (1) Diskette or Card Reader
      - (2) Keyboard & Diskette
    - **Printer**
      - (1) Printer
      - (2) Printer

- **Online Batch Jobs**
  - **Diskette or Card Reader**
  - **Line**

---

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Online Interactive Job

Keyboard* Line Console Printer

* One input device and one output device per job. Output to console printer is automatic when input is keyboard.

(1) One input device and one output device per job. Monitor print is an additional output option when diskette, card punch or line is the output device.

(2) Recorders, logon to Model 36010 is required in addition to I/O devices to allow multiple input and output devices for a job.

Limitations: The input/output capabilities outlined under "Highlights" are dependent on appropriate configurations of the terminal. Keyboard and console printer are standard. For other configurations refer to "Special Features" below.

Programmable Models Without Emulator Specify Feature

Offline Operations - are controlled by a user written program. The 3774 interprets the user written program after it is loaded to terminal. Keyboard and console printer are standard. For other operations, buffers, etc., including 0.75K bytes for basic three buffers XK bytes for each data for a max. of 5.

Storage Considerations - storage is used for executing a 3770 application program that is loaded from diskette, for Communications Mode, for data buffers, and for execution of device-related functions that are specified by the opening statement in the application program. Storage may also be allocated for devices and functions that are selected in the Terminal Configuration Utility. The amount of storage required for devices or functions is:

- Supervisor Control Code Resident
- Programmable Communications - BSC
- Communications Mode
- Basic (diskette and console printer I/O)
- Additional Storage for Card I/O & 3784 Printer
- Using BSC Communications
- Using SDLC Communications
- Additional Storage Using SDL
- Multiple SYS.INTR Function
- Format Image Buffer (Power on Allocation only)
- 3501 Card Reader
- 3502 Card Reader
- Display Feature
- 3521 Card Punch
- Read-Next Buffers (optional for diskette operation)

The amount of storage required is also dependent upon the following variables:

- Size of 3770 application program
- Working storage for tables, storage to other operations, buffers, etc., including 0.75K bytes for basic three buffers
- Online Communications Operation - terminals equipped with the appropriate I/O and Communications features can operate as follows:

- Transmission is controlled by the Communications Mode function or by a user written program using the Programmable Communications function. Communication Mode provides for selection of diskette datasets, card reader or keyboard (Logon) for input data. Output data can be directed to a diskette data set, card punch, console printer or 3784 Printer. Support is provided for printer horizontal and vertical format control. The programmable Communications capability allows for transmission of data with any I/O device under control of a user written program.

Diskskette Storage Device - with 99,840 bytes of storage is standard on a non-removable diskette. Characteristics of the non-removable diskette are one read/write surface, 30 data tracks, 26 sectors per track and 128 bytes per sector. Up to 38,256-byte records or up to 768 128-byte records can be stored on the non-removable diskette. Programmable diskette operation (SDL) reduces the amount of storage for user data from 30 to 28 tracks.

The additional Diskette Storage Devices providing 242,944 bytes of storage on removable reusable diskettes are provided by special feature.

The diskettes can be used for storage of 3770 application programs and for application data. The maximum number of user written data sets that can reside on the non-removable diskette and removable diskette is 16. A maximum of seven data sets can be opened for any one program. A program library data set can contain a maximum of 99 user written programs. Program identification can be numbered from 01 to 99.

CPU Interrupt - can automatically occur during offline programs in order to receive an unsolicited CPU message. The message is stored on diskette storage (or, under certain conditions, printed on the console printer) and the offline program is automatically resumed. A manual switch on the keyboard enables/disables this mode of operation.

Address Stop Function -- is provided to facilitate debugging of 3770 application programs at the terminal site. The status of program resources at the stop-address can be outputted to printer or display.

Bibliography: GC20-0001

Specify: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9800 for locking plug or #9881 for non-lock plug.

[2] Color: 9041 for red, 9042 for yellow, 9043 for blue, or 9045 for gray. Note: Available at time of manufacture only.

[3] Remote Power Off: #9501 specifies this feature for capability to power down terminal from the host CPU using a controlled data sequence sent over communication facilities.


[5] Emulator: #9141 specifies this feature to equip the terminal with the non-programmable function in lieu of the standard programmable function. Non-programmable notation on the keyboard and operator panel is provided by this feature. Field Installation: Not recommended. It can be field removed to change the terminal from non-programmable to programmable function.

[6] Alternate Address: #9011 ...

The diskette can be used for storage of 3770 application programs and for application data. The maximum number of user written data sets that can reside on the non-removable diskette and removable diskette is 16. A maximum of seven data sets can be opened for any one program. A program library data set can contain a maximum of 99 user written programs. Program identification can be numbered from 01 to 99.

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[6] Alternate Address: #9011 ...

Order this optional feature to specify that diskettes containing terminal control code engineering changes are to be mailed to an alternate address using a Teleprocessing Control number. The alternate address selected is usually the central site location. Limitations: [1] For models P1, P2 only ... [2] Not with Emulator (#9141) ... [3] Each EC control diskette has been manufactured for use on the specific machine type/serial on the diskette label.

The diskette for the 3774 terminal are unconfigured when they are mailed from IBM and have 23 tracks of storage available for user data. After the diskette is configured on the machine type/serial on which it is to be used, the amount of storage for user data is as follows: 30 tracks - configured to not use programmable communications SDL ... 28 tracks - configured to use programmable communications SDL. For additional information, see "Data Set Support" in the Operator's Guide, GA27-3114.

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Termination Chg Percent: 25% Upper Limit Percent: 0%
M 3774.3
Jul 79

2400 BPS INTEGRATED MODEM, NON-SWITCHED, POINT-TO-POINT (#5600). This self-clocked modem provides point-to-point operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, MULTI-POINT (#5602). This self-clocked modem provides point-to-point operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting transmit and receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, SWITCHED WITH AUTO ANS- swer (#5610). One self-clocked modem provides point-to-point operation over switched communication facilities using manual originate/auto answer for establishing connection. Operator controls provide for half-speed operation and for adjusting transmit and receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). The user must provide an Integrated Modem for operation at 1200 BPS. Limitation: Cannot be installed with any other Integrated Modem.

SUB-FEATURES FOR 2400 BPS INTEGRATED MODEMS

SWITCHED NETWORK BACK-UP (#7951). Provides the capability of attaching 2400 BPS Integrated Modem (#5600 or #5602) to any switched network facility as back-up to the primary non-switched facility. Operation over the switched network is in manual originate/answer mode. Limitation: Cannot be installed with any other Integrated Modem.


2400 BPS INTEGRATED MODEM, NON-SWITCHED, MULTI-POINT (#5602). Provides point-to-point operation over switched communication facilities using manual originate/auto answer for establishing connection. Operator controls provide for half-speed operation and for adjusting transmit and receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, SWITCHED WITH AUTO ANSWER (#5610). Provides point-to-point operation over switched communication facilities using manual originate/auto answer for establishing connection. Operator controls provide for half-speed operation and for adjusting transmit and receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). The user must provide a Data Coupler type CBS or equivalent. Limitation: Cannot be installed with any other Integrated Modem.


EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communication procedure using SDLC or BSC under operator switch control. SDLC allows point-to-point or multi-point operation. BSC operation is point-to-point without #1462, multi-point with #1462. Maximum: One. Limitation: Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. Maximum: One. Limitation: Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched or non-switched SDLC procedure. Maximum: One. Limitation: Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.


COMMUNICATION DRIVER ... one can be selected.

WITHOUT BUSINESS MACHINE CLOCKING (#1461). Provides communication driver without clocking. Maximum: One. Prerequisite: Communication Feature #1460, #1461, or #1470. Limitation: Cannot be installed with #1482.

BSC MULTIPONT (#1462). Provides communication driver with 1200 BPS clocking. Maximum: One. Prerequisite: Communication Feature #1460, #1461 or #1470. Limitation: Cannot be installed with #1482.

EIA INTERFACE (#3701). Provides a cable and interface meeting RS-232C characteristics for attachment of an IBM Modem or non-IBM modem data set. Speeds up to 4800 bps for switched or non-switched operation. This feature in combination with #1481 can be used to attach the Modem Fan-out (#3901) on an adjacent terminal, or on an IBM 368, 3684, 3784 or 3780 Modem. This feature in combination with #1482 can be used for direct attachment to a 3704 or 3705 equipped with Local Attachment (#4716) for operation at 1200 bps synchronous. Maximum: One. Prerequisite: Communication Driver (#1481 or #1482). Limitation: Cannot be installed with any Integrated Modem feature.

2400 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides for point-to-point or multi-point operation over non-switched communication facilities. Maximum: One. Prerequisite: Communication Driver (#1482). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, SWITCHED, AUTO ANS- swer (#5501). Provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. Maximum: One. Prerequisite: Communication Driver (#1482). The user must provide a Data Coupler type CBS or equivalent. Limitation: Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANS- swer (#5502). Provides for point-to-point operation over switched network facilities using manual originate/manual answer for establishing connection. Maximum: One. Prerequisite: Communication Driver (#1482). The user must provide a Data Coupler type CBS or equivalent. Limitation: Cannot be installed with #3701, or with another Integrated Modem.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphic characters) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with diskette storage features and 3754 Printer Attachment Feature, and with BSC features #1461, or #1462, or both may be required on the using system. This feature can be used with BTAM programs for public and private line systems. Maximum: One. Limitation: Cannot be installed with any other Integrated Modem.

MODEM FAN-OUT (#3901). Equips the 2400 BPS Integrated Modem, Non-Switched (#5600 or #5602) with the capability to be shared by up to two other terminals in addition to the host. Maximum: One. Prerequisite: 2400 BPS Integrated Modem (#5600 or #5602). Limitation: This feature can be used at a tributary station in a centralized multipoint network. In this configuration BSC multi-point programming discipline or SDLC non-switched programming discipline will provide the selection/control of the terminal without any additional user involvement.

AUDIBLE ALARM (#1390). Produces an audible alarm in the event of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. Maximum: One.

DISPLAY (#3250). Provides a 48 character (12 lines of 40 characters each) information display under control of the 3770 application program. Maximum: One. Prerequisite: Model P1 or P2. Limitation: Not available for model 1 or 2. This feature cannot be installed with Emulator (#9141).

DOOR KEYLOCK (#3401). Provides a keylock and two keys for the desk-console door. Maximum: One. Limitation: The keys provided with this lock can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for the desk-console cabinet doors. Maximum: One. Prerequisite: Diskette Storage, 2nd (#4650). Limitation: The keys provided with this lock can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with this feature. Refer to M 10000 pages for information on additional or replacement keys. Maximum: One.

KEYPAD, NUMERIC (#4660). Provides a keypad in adding machine arrangement to facilitate rapid entry of numeric only data.

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3774 Communication Terminal (cont’d)

Maximum: One. Prerequisite: Model P1 or P2. Field installation: Not recommended. Limitations: Not available for Model 1 or 2. This feature cannot be installed with Emulator (#9141).

DISKETTE STORAGE, 1ST (#4901). One device with a customer removable diskette is placed in the left cabinet. Additional diskettes are available. Characteristics of the diskette storage device are: one movable read/write head, one read/write surface, 73 data tracks, 26 sectors per track and 128 bytes per sector. Up to 949 256-byte records can be stored on the diskette (one 256-byte record is reserved for job identification information) in the 3774 mdl 1 and 2. Each 256-byte record is stored in two consecutive numbered sectors in interchange mode, or in two non-consecutive sectors in 3770 mode. Diskette code is insensitive in SDLC, non-transparent only in BSC mode. Record Update (3774 mdl 1 or 2) - allows a record to be read into the diskette 1, updated, and written to the other diskette. Record Format Feature (#6010) is a prerequisite for this update capability.

Maximum: Diskette Storage, 1st (#4901).
Orders for Field Installation: Must specify color - #9081 for red, #9082 for yellow, #9083 for blue, or #9085 for gray ... color must be the same as that specified for the base machine.

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Maximum: One. Prerequisite: Diskette Storage, 1st (#4901). This feature cannot be used when Emulator (#9141) is removed.

RECORD FORMAT FEATURE (#6010). Provides an offline capability for constructing records using more than one input and output field. Input can be keyboard and/or diskette as an attached card reader. Output can be console printer and/or diskette or the attached card punch. A record format specification record stored on diskette can be defined and changed by the user to permit selection by field for merging and creating, in any sequence within a transaction cycle. It also permits selecting output by field, so that multiple fields may be within a transaction cycle, with multiple transaction cycles within a job. Provision is also made with this feature for self-checking, decimal insertion, right justify and other grouping.

A record format specification record can be loaded to diskette from the line, keyboard, or card reader. This feature increases the size of "extend buffer" from 512 to 2048 bytes. Maximum: One. Prerequisite: For 3774 mdls 1 and 2 - Diskette Storage 1st (#4901) and Emulator (#9141). Limitations: Extend buffer and update operation is not permitted for a record format specification job cannot be interrupted by the CPU automatically, operator intervention is required. This feature is compatible with terminal programmability and will be removed from model 1 whenever Emulator (#9141) is removed.

STORAGE INCREMENT, 4K (#6800). Provides an additional 4096 bytes of programmable storage. Maximum: One. Prerequisite: Model P1 or P2. Limitations: Not available for mdls 1 or 2, or with #6800, #6801 or #6803. This feature cannot be installed with Emulator (#9141).

STORAGE INCREMENT, 8K (#6801). Provides an additional 8192 bytes of programmable storage. Maximum: One. Prerequisite: Model P1 or P2. Limitations: Not available for mdls 1 or 2, or with #6800, #6802 or #6803. This feature cannot be installed with Emulator (#9141).

STORAGE INCREMENT, 12K (#6802). Provides an additional 12K bytes of programmable storage. Maximum: One. Prerequisite: Model P1 or P2. Limitations: Not available for mdls 1 or 2, or with #6800, #6801 or #6803. This feature cannot be installed with Emulator (#9141).

STORAGE INCREMENT, 16K (#6803). Provides an additional 16,384 bytes of programmable storage. Maximum: One. Prerequisite: Model P1 or P2. Limitations: Not available for mdls 1 or 2, or with #6800, #6801 or #6802. This feature cannot be installed with Emulator (#9141).


3782/2502 CARD READER ATTACHMENT (#8149). To attach a 3782 Card Reader Attachmentmdl 2 and a 2502 Card Reader mdl A1 or A2. The 2502 can be equipped with special features for 51/80 or 66/80 column cards and/or Optical Mark Read. A companion MMR special feature is required on the 3782 mdl 2. Maximum: One. Limitation: Cannot be installed with 3501 Card Reader Attachment (#8050).

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Reader Attachment mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. Maximum: One. Limitation: (Non-programmable mdls only) If a 2502 or 3501 Card Reader is also attached (#8149 or #8050), the Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.

3784 PRINTER ATTACHMENT (#8155). To attach a 3784 Line Printer as a second printer. Maximum: One.


Special Feature Prices:

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<td>#6030</td>
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<td>Storage Increment, 12K</td>
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<td>38</td>
<td>9.10</td>
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<td>Storage Increment, 16K</td>
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<td>43</td>
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<tr>
<td>#8050</td>
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<td>3784 Printer Attachment</td>
<td>19</td>
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<td>6.40</td>
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</table>

* Customers who elect to purchase one of these features and anticipate later ordering additional storage, should consider purchase of the larger storage initially because field upgrade requires replacement of the initial feature.

ACCESSORIES: For Forms Stand (#4450) ... see page 3775.4.

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IBM 3775 COMMUNICATION TERMINAL

Purpose: This desk-style console-keyboard-printer is a member of the 3770 Data Communication System. The basic printer operates at a maximum speed of 120 lines per minute using a 64 character set, 80 lines per minute using a 94 character set, or 150 or 300 cards per minute. One of three card readers can be selected for operation at speeds of 50, 150 or 300 cards per minute. The card punch operates at 50 cards per minute, and Communication features allow for operation over switched or non-switched facilities at speeds up to 4800 bps using SDLC or BSC transmission techniques and a appropriate modem.

Model 1: Non-programmable

Model P1: User programmable

Highlights

All Models

Keyboard — EBCDIC arrangement with 44 data keys (produces 88 characters). Underscore/ HYphen, Backspace, Space and "Print Character" ("Character" on programmable models) keys have typamatic operation. Associated with the keyboard are three-position numeric display.

Printer — during a key entry job, the print platen lowers to provide printing visibility. Printing is from characters engraved on a revolving print belt. Included as standard is one interchangeable print belt (either 64 or 94 character set), variable width forms tractors for feeding continuous forms up to 15 inches in width, paper jam detection, and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 8 per inch. Maximum print speed is 120 lines per minute with the 64 character set, or 80 lines per minute with the 94 character set. Continuous card stock forms are not recommended. Refer to GA24-3488 for forms design considerations.

Performance Considerations — actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, etc., must all be considered in determining actual throughput. See IBM 3770 Communication System, GA27-3097, for additional information.

Problem Determination Procedures — significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of problem identification and recovery routines and procedures that are easily understood and used by the operator. See IBM 3774/3775 Operating Procedures, GA27-3094 or IBM 3773, 3774 and 3775 Programmable Communication Terminals Operator's Guide, GA27-3114.

Communications — see "Special Features." Transmission speeds up to 4800 bps over switched facilities are allowed by selecting the appropriate modem and communication facility. Refer to M 2700 pages for information on communication facilities and other attachment facilities. Also refer to 3872 and 3874 in configured can be intermixed on the same communication facility.

Supplies — a black ribbon. IBM Part No. 1136364, or equivalent, is required.

Customer Responsibilities — it will be the customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Prerequisites:

For SDLC Communications with S/370 or 4300 Processor — a 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage on S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or these operating systems running under VM/370 (OS/VS2 is not supported by the 4300 Processors).

For BSC Communications with S/360 or S/370 or 4300 Processor — a virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2 or under RSCS (non-programmable terminals only) and VM/370, or any of these operating systems running under VM/370 (OS/VS2 is not supported by the 4300 Processors). The 3770 Communication Terminals use 2770 BSC programming support when operating in BSC models. See SRL GA27-3097 for BSC compatibility considerations. The customer may have to modify existing 2770 application programs for operation with non-programmable models of the 3770. The customer will have to modify existing application programs for operation with programmable models of the 3770. BSC attachment can be made via a 3704/3705 Communications Controller or a 2701 Data Adapter Unit attached to a channel of any S/370 or 4300 Processor; or via an Integrated Communications Adapter on S/370 or S/370 Series 115, 125, 135, 135-3, or 138; or via a Communications Adapter feature on the 4331 Processor. BSC attachment can be made via a 3704/3705 attached to a channel of a S/360 30 or 40, 50, 65, 67 (in 65 mode), 75 or 150, or via an Integrated Communications Attachment on S/360 model 25.

Non-programmable Model and Programmable Model with Emulator Specify Feature

Dual 256-Byte Buffers — transfer data between the input and output devices. The buffers alternate in providing input and output service to permit overlapped operation.

Buffer Edit — allows corrections to be made on the contents of a buffer during key entry jobs. A 256-byte diskette record, if the diskette feature is present, can also be retrieved into the buffer using Update Mode and be corrected using buffer edit functions. Corrections can be made by character, by line or by entire buffer (up to 256 bytes).

Extend Buffer — combines the dual 256-byte buffers into a single 512-byte buffer under operator control for keyboard to line or keyboard to diskette jobs. Buffer edit capability applies to the full 512 bytes. Buffer transfers to line or diskette are in 256-byte increments and cannot be overlapped.

Printer Format Controls — facilitate the formatting of printed data. Vertical and horizontal tabbing or underline can be initiated by vertical or horizontal tabbing. Format controls for up to five jobs can be entered from keyboard, or from diskette or card if either one of these devices is attached.

Compression/Expansion — provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from cards. A two byte sequence is substituted for each occurrence of three or more consecutive blank card columns (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 64 consecutive blank columns are read. The terminal monitors received non-transparent data that is destined for the printer or attached card punch and automatically expands this two-byte sequence to the correct number of blanks. A similar capability is provided when using SDLC procedures.

Auto Interrupt — allows the terminal to automatically interrupt an offline job for an online job initiated by the host CPU. The terminal stops the offline job, executes the online job for receiving line data and automatically restarts the offline job without operator intervention. A manual switch on the keyboard enables/disables this mode of operation. See Operating Characteristics — Automatic Interrupt in 3770 System Components Manual, GA27-3097.

Input/Output Job Definitions — can be operator or terminal defined. Up to five operator defined jobs can be read from diskette or card reader to facilitate rapid job set-up when the terminal is equipped with either of the special features, otherwise they can be entered from the keyboard under control of a prompting sequence and executed from temporary storage. Printer format controls can be part of this job definition. An appropriately configured 3775 will permit job designation as follows:

Offline Jobs

Input

Output

Keyboard*  
(1) Diskette
(1) Console Printer, Diskette or Card Punch
(2) Card Reader
(2) Console Printer, Diskette or Card Punch
(2) Keyboard & Diskette
(2) Console Printer & either Diskette or Card Punch
(4) Keyboard & Card Reader
(4) Console Printer & either Diskette or Card Punch

Online Batch Jobs

(1) Diskette or Card Reader  
(1) Line
(1) Console Printer, Diskette or Card Punch

Online Interactive Jobs

Keyboard*  
(1) Line
(1) Console Printer

* One input and one output device per job. Output to console printer is automatic when input is keyboard.

(1) One input device and one output device per job. Monitor print is an additional option when diskette, card punch or line is the output device. (2) Record Format Feature (#6010) is required in addition to I/O devices to allow multiple input and output devices for a job.
377 Communication Terminal
(cont'd)

Limitations: The input/output capabilities outlined under "Highlights" are dependent on appropriate configurations of the termi­nal. Keyboard and console printer are standard. For other configurations refer to "Special features" below.

Programmable Model Without Emulator Specify Feature

Offline Operations -- are controlled by a user written program. The 3775 interprets the user written program after it is loaded to program storage from diskette storage. The 3775 has 6K bytes of program storage as standard. Additional 4K, 8K, 12K or 16K bytes of program storage are available by special feature to a maximum of 16K additional bytes of program.

A program can be selected and invoked by the operator, by a prior program call, or by an auto execute command from the host CPU. Valid data sources for offline operations are the Operator ID Reader, keyboard, diskette storage and card reader. Valid data output devices are the console printer, diskette storage, card punch and display.

3775P system utilities provide additional capabilities for the following operations:

Card reader to console printer, diskette or card punch.
Card print (Read Interpret).
Keyboard to card punch.
Create, copy, list diskette.
Data set support for bypass, create, delete, erase, rename and write protect data set.
Data set update for create, read, write and dump data set.
Copy data set.
Program library support.
Set date.
Set Configuration.

Storage Considerations -- storage is used for executing a 3770 application program that is loaded from diskette, for Communications Mode I/O buffers, and for execution of device-related functions that are specified by the opening statement in the application program. Storage may also be allocated for devices and functions that can operate on time through options available in the Terminal Configuration Utility. The amount of storage required for devices or functions is:

- Supervisor Control Code Resident: 3.0K bytes
- Programmable Communications - BSC: 2.0K bytes
- Programmable Communications - SDLC: 7.0K bytes
- Communications Mode Mainframe: 6.0K bytes
- Additional Storage for Card I/O & 3784 Printer: 4.0K bytes
- Using BSC Communications: 4.0K bytes
- Using SDLC Communications: 5.75K bytes
- Additional Storage Using SDLC: 75K bytes
- Multiple SYS. INT Function: 75K bytes
- Format Image Buffer (Power on Allocation only): 256 bytes
- 3501 Card Reader: 1.75K bytes
- 2502 Card Reader: 2.5K bytes
- Display Feature: 2.0K bytes
- 3521 Card Punch: 3.0K bytes
- Read-Next Buffers: 0.25K bytes
- (optional for diskette operation) for each data set to a max. of 5.

The amount of storage required is also dependent upon the following variables.

Size of 3770 application program: XK bytes
Working storage for tables, storage to storage operations, buffers, etc., including 0.75K bytes for basic three buffers: XK bytes

Online Communications Operation -- terminals equipped with the appropriate I/O and Communications features can operate as follows:

Transmission is controlled by the Communications Mode function or by a user written program using the Programmable Communications function. Communicate Mode provides for selection of diskette data sets, card reader or keyboard (Logon) for input data. Output data can be directed to a diskette dataset, card punch or console printer. Support is provided for printer horizontal and vertical format control. The Programmable Communications capability allows for transmission of data with any I/O device under control of a user written program.

Diskette Storage Device -- with 99,840 bytes of storage is standard on non-removable diskette. Characteristics of the non-removable diskette are: 30 data tracks, 26 sectors per track, and 128 bytes per sector. Up to 390 256-byte records or up to 750 125-byte records can be stored on the non-removable diskette.

Two additional diskette storage devices providing 242,944 bytes of storage each on removable, reusable diskettes are provided by special feature.

The diskettes can be used for storage of application programs and for application data. The maximum number of user written data sets that can reside on the non-removable diskette and on each removable diskette is 18. A maximum of 7 data sets can be opened for any one program. A program library data set can contain a maximum of 99 user written programs. The 3775 interprets the user written program after it is loaded to program storage from diskette storage.

CPU Interrupt -- can automatically occur during offline programs in order to receive an unsolicited CPU message. The message is stored on diskette storage (or, under certain conditions, printed on the console printer) and the offline program is automatically resumed. A manual switch enables/disables this mode of operation.

Address Stop Function -- is provided to facilitate debugging of 3770 application programs at the terminal site. The status of program resources at the stop-address can be outputted to printer or display.

Bibliography: GC20-0001

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. Note: Available at time of manufacture only.
[3] Remote Power Off: #9501 ... specify this feature for capability to power down terminal from the host CPU using a controlled data sequence sent over communication facilities.
[4] Print Belt Character Set: Specify one. Available at time of manufacture only. See Print Belt in M 10000 pages. #9491 for 4 Character Set EBCDIC, #9492 for 44 Character Set EBCDIC, #9494 for 44 Character Set ASCII, or #9495 for 44 Character Set ASCII. #9494 and #9495 require ASCII Feature (#1201).
[6] Emulator: #9141 ... specify this feature to equip the terminal with the non-programmable function in lieu of the standard programmable function. Non-programmable notation on the keyboard and operator panel is supplied by this feature. Field Installation: Not recommended. It can be field removed to change the terminal from non-programmable to programmable function.
[7] Alternate Address: #9011 ... for RECORD PURPOSES only. Order this optional feature to specify that diskettes containing terminal control code engineering changes are to be mailed to an alternate address using a Teleprocessing Control number. The alternate address selected is usually the central site location. Field installable. Limitations: [1] For model P1 only ... [2] Not with Emulator (#9141) ... [3] Each EC control diskette is manufactured for use on the specific machine type/desired shown on the diskette label. EC diskettes for the 3775 model are unconfigured when they are mailed from IBM and have 23 tracks of storage available for user data. After the diskette is configured on the machine type/desired on which it is to be used, the amount of storage for user data is as follows: 30 tracks - configured to use programmable communications SDLC ... 28 tracks - configured to use programmable communications SDLC. For additional information, see "Data Set Support" in the Operator's Guide, GA27-3114.

PRICES: Mn 3775 1+ MAC/ MRC 2 Yr Purchase MMMC

<table>
<thead>
<tr>
<th>Model</th>
<th>HY</th>
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<tr>
<td>P1</td>
<td>470</td>
<td>400</td>
<td>16,000</td>
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</table>

Plan Offering: Plan B
Machine Group: D
Per Call: $16,000
Termination Chg Mths: 5
Termination Chg Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field installable ... for Model 1 on an "As Available" basis. Limitation: Model downgrade from model P1 to model 1 is not permitted.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 1 to Model P1 .......... $4,900

SPECIAL FEATURES
All special features can be field installed, except #1201, #3551 and #4660 for which field installation is not recommended. Special features for 3775 model 1 are on an "As Available" basis for field installation.
For Communication Capability -- select one Communication

† No longer available.

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3775 Communication Terminal (cont'd)

Feature (#1460, 1461 or 1470) ... one Communication Driver (#3701). One Integrated Modem (#3500, 3501, 3502, 5600, 5602 or 5603) and EIA Interface (or 5610). #1462 is required in addition to #1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE ... one can be selected.

SDLC/BSC SWITCH CONTROL (#1460). Provides communica-
tion procedure using SDLC or BSC under operator switch con-
trol. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. One. Limitation: Cannot be installed with #1460 or #1470. See SRL G27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. Maximum: One. Limitation: Cannot be installed with #1460 or #1470. See SRL G27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC procedures. Maximum: One. Limitation: Cannot be installed with #1460 or #1470. For record purposes also identify the primary CPU/Program Environment code. Specify one of the following: #9977 for DOS/VS VTAM, #9988 for OS/VS1 VTAM, #9989 for OS/VS2 VTAM, #9993 for all other combinations of operating systems and access methods.

BSC MULTIPORT (#1462). Required for BSC multipoint operation over non-switched facilities. Maximum: One. Prerequisite: #1460 or #1461. Limitation: See SRL G27-3097 for BSC compatibility considerations.

COMMUNICATION DRIVER ... one can be selected.

WITHOUT BUSINESS MACHINE CLOCKING (#1481). Provides communication driver with 1200 bps self-clocking, with #1460 or #1470. For record purposes also identify the primary CPU/Program Environment code. Specify one of the following: #1481 or #1482. One. Limitation: Communication Feature (#1460, 1461 or 1470). Limitation: Cannot be installed with #1482.

WITH 1200 BPS BUSINESS MACHINE CLOCKING (#1482). Provides communication driver with 1200 bps self-clocking, with #1460 or #1470. For record purposes also identify the primary CPU/Program Environment code. Specify one of the following: #1481 or #1482. One. Limitation: Communication Feature (#1460, 1461 or 1470). Limitation: Cannot be installed with #1482.

EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

EIA INTERFACE (#3701). Provides a cable and interface meet-
ning RS-232C characteristics for attachment of an IBM Modem or non-IBM modem. Speeds up to 4800 bps for switched or non-switched operation are permitted. This feature in combination with #1481 can be used to attach to Modem Fan-out (#3901) on an adjacent terminal, or on an IBM 3837, 3847,3872 or 3874 Modem. This feature in combination with #1482 can be used for direct attachment to a 3704 or 3705 equipped with Local Attach-
ment (#4716) for operation at 1200 bps synchronous. Maximum: One. Prerequisite: Communication Driver (#1481 or 1482). Limitation: Cannot be installed with any Integrated Modem feature.

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#5500). Provides point-to-point or multipoint operation over non-switched communication facilities. Maximum: One. Prerequisite: Communication Driver with Clock (#1482). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5501). Provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. Maximum: One. Prerequisite: Communication Driver (#1482). The user must provide a Data Coupler type CBS or equivalent. Limitation: Cannot be installed with #3701, or with another Integrated Modem.

1200 BPS INTEGRATED MODEM, SWITCHED, MANUAL ANSWER (#5502). Provides for point-to-point operation over switched network facilities using manual originate/ manual answer for establishing connection. Maximum: One. Prerequisite: Communication Driver (#1482). The user must provide a Data Coupler type CBS or equivalent. Limitation: Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, MULTI-
POINT (#5602). This self-clocked modem provides for point-to-
point operation over non-switched communication facilities. Operator control provide for half-speed operation and for adjusting transmit and receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, POINT-TO-
POINT (#5600). This self-clocked modem provides for point-to-
point operation over non-switched communication facilities. Operator control provide for half-speed operation and for adjusting transmit and receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, SWITCHED, AUTO ANSWER (#5610). This self-clocked modem provides for point-to-
point operation over non-switched communication facilities. Operator control provide for half-speed operation and for adjusting transmit and receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

SUBFEATURES FOR 2400 BPS INTEGRATED MODEMS

SWITCHED NETWORK BACK-UP (#7951). Provides the capability of attaching 2400 BPS Integrated Modem (#5500 or 5600) to the switched network facility as a back-up to the primary non-switched facility. Operation over the switched network is in manual originate/ manual answer mode to establish the connec-
tion. It can communicate at 2400/1200 bps with an IBM 3872 Modem equipped for operation over the public switched network (#7941, 7951 or 7952) attached to a 3704, 3705, or ICA of 3115 or 3125. Note: To use this feature operator intervention at the terminal is required. Operator intervention, program modifi-
cation, or both may be required on the using system. This fea-
ture can be used with BTAM programs for DOS/VS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required in existing BTAM programming to fully utilize the capabilities of this feature. Maximum: One. Prerequisite: 2400 BPS Integrated Modem, Non-Switched (#5500 or 5600). The user must provide a Data Coupler type CBS or equivalent. Limitation: Cannot be installed with #3701.

MODEM FAN-OUT (#3901). Equips the 2400 BPS Integrated Modem, Non-Switched (#5500 or 5600) with capabilities to be shared by up to two other terminals in addition to the host. Maximum: One. Prerequisite: #5602. Limitation: This feature can be used with any station in a switched or non-switched network. In this configuration, BSC multipoint programming discipline or SDLC non-switched programming discipline will provide the selection/control of the terminal without any addi-
tional involvement.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keypad. This feature also provides for operation with diskette storage features and with BSC features #1460, 1461 or 1462; or with SDLC features #1460 or #1470. Orders for #1201 must also specify one print belt, #9844 for 64 character ASCII or #9495 for 94 character ASCII ... see "Specification." Maximum: One. Field Installation: Not recommended. Limitation: The GETKB programming statement cannot be used in programs that are to be run on an ASCII machine.

Audible Alarm (#1390). Sounds an alarm to alert the operator of conditions requiring manual intervention. The alarm can be ena-
bled and reset from the keyboard. Maximum: One.

DISPLAY (#3250). Provides a 480 character (12 lines of 40 characters each) information display under control of the 3770 application program. Maximum: One. Prerequisite: Model P1. Limitation: Not available for model 1. This feature cannot be installed with Emulator (#9141).

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. Maximum: One. Limitation: The keys provided with this feature can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. Maximum: One. Prerequisite: Computer Storage, 2nd (#9402). Limitation: The keys provided with this lock can be duplicated by local key makers. Additional or replacement keys are not available from IBM.

DUAL INDEPENDENT FORMS FEED (#3551). [3775 m'dl P1 only] Provides two independently indexed pin feed mechanisms on the console line printer with visibility platen. They operate under control of a 3775 application program. Different sizes of forms can be handled in each paper feed. Refer to GA24-3488 for forms design considerations. Maximum: One. Field Installation: Not recommended. Limitation: This feature cannot be installed with Emulator (#9141).

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control. Each module has its own unique key. Two identical keys are supplied with this feature. Refer to M10000 pages for information on additional or replace-

DISKETTE STORAGE, 1ST (#4901). One device with a customer
removable diskette is placed in the left cabinet. Additional diskettes are available from IBM ... see IOD Sales Manual. Characteristics of the diskette storage device are: one movable read/write head; one read/write surface; 73 data tracks; 26 sectors per track and 256 bytes per sector. Up to 949 256-byte records can be stored on the diskette (one 256-byte data record is reserved for job identification in a 3775 model 1). Each 256-byte record is stored in one movable read/write head in one of the numbered sectors (4901). Up to 256 non-consecutive sectors in 3775 mode. Diskette data is code insensitive in SDLC mode, non-transparent only in BSC mode (3775 model 1). The second diskette model 1 provide the operator with the capability of reading a 256-byte diskette record into the terminal buffer where it can be printed, edited or deleted. Maximum: One.

**DISKETTE STORAGE, 2ND (#4902).** Provides a second diskette storage device with the same characteristics as the first. It is placed in the right desk cabinet which is also supplied by the feature. See specifications for additional details.

Copy — data can be copied from diskette 1 to diskette 2 (single data set or all active data sets.)

Concatenate (pool) — the ability to concatenate on a data set basis.

Continue (3775 mdl 1) — allows a read or write operation to automatically continue on diskette 2 if it has been placed in ready condition. Continue is not allowed while keying data.

Record Update (3775 mdl 1) — allows a record to be read into the terminal buffer from diskette 1, updated from the diskette 2, and written to the other diskette. Record Format Feature (#0601) is a prerequisite for this update capability.

Maximum: One. Prerequisites: Diskette Storage, 1st (#4901). Orders for Field Installation: Must specify color — #9083 for red, #9084 for yellow, or #9085 for gray ... color must be specified for the reader machine.

**OPERATOR ID READER (#5450).** Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits of parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read.

With a BSC non-programmable terminal, a read operation can be initiated during a keyboard to line job output. Data read from the magnetic stripe card cannot be printed. For programmable terminals the Operator ID Reader is controlled by the 3777 application program. Maximum: One. Limitations: (1) The operator must position and slide the card through the reader-slot at a steady rate between 30 and 40 inches per second for read operation; (2) BSC programming for the 2777 does not support this feature.

**RECORD FORMAT FEATURE (#0601).** Provides an offline capability for constructing records using more than one input and output device. Input can be keyboard and either diskette or an attached card punch. A record format specification record stored on a diskette can be defined and changed by the user to permit selection by field for merging or creating, in any sequence within a transaction cycle. It also permits selecting output by field. There may be multiple fields in a transaction and each field may have its own cycle. Provision is also made with this feature for self-checking, decimal insertion, right justify and fill, and numeric checking. A record format specification record stored on diskette is available to the line, keyboard, or card reader. This feature increases the size of "extend buffer" from 512 to 2048 bytes. Maximum: One. Prerequisites: For 3777 model 1 — Diskette Storage 1st model 1, and Emulator (#9141). Limitations: Extended buffer and update operation is not permitted for a record format job. A record format job cannot be interrupted by the CPU automatically; operator intervention is required. This feature is not compatible with terminal programmability and must be removed from a 3775 model P1 whenever Emulator (#9141) is removed.

**STORAGE INCREMENT, 4K (#6800).** Provides an additional 4096 bytes of programmable storage. Maximum: One. Prerequisite: Model 1. Limitations: Not available for model 1, with features #6800, 6801, or 6802. This feature cannot be installed with Emulator (#9141).

**STORAGE INCREMENT, 8K (#6801).** Provides an additional 8192 bytes of programmable storage. Maximum: One. Prerequisite: Model P1. Limitations: Not available for model 1, with features #6800, 6801, or 6802. This feature cannot be installed with Emulator (#9141).

**STORAGE INCREMENT, 12K (#6802).** Provides an additional 12,288 bytes of programmable storage. Maximum: One. Prerequisite: Model P1. Limitations: Not available for model 1, with features #6800, 6801, or 6802. This feature cannot be installed with Emulator (#9141).

**STORAGE INCREMENT, 16K (#6803).** Provides an additional 16,384 bytes of programmable storage. Maximum: One. Prerequisite: Model P1. Limitations: Not available for model 1, or with features #6800, 6801, or 6802. This feature cannot be installed with Emulator (#9141).
Purpose: The 3776 is a medium speed remote job entry terminal and is a member of the 3770 Data Communication System. The 3776mdl 1 and 2 are SNA Single Logical Unit and BSC terminals. A keyboard is used for terminal control and may be used for operator communication with the host CPU. The 3776 is not designed as an interactive terminal. The terminal contains an engraved character font belt (45, 64 or 94 character set) which may be interchanged by the operator. Special features permit one or two diskette storage devices and provide for the attachment of one or two card readers and one card punch. One of three card readers can be selected for operation at speeds of 50, 150 or 300 cards per minute. The card punch operates at 50 cpm. A special feature provides for paper insertion from either the front or rear of the machine.

Communication features allow for operation over switched or non-switched facilities at speeds up to 4800 bps using SDLC or BSC transmission techniques and an appropriate modem.

Model 1 3776

Max Lines Character Per Minute Set

Model 1 3776

Max Lines Character Per Minute Set

Model 2 3776

Max Lines Character Per Minute Set

Highlights:

Keyboard -- EBCDIC arrangement with 44 data keys (produces 98 characters). Underscore/Hyphen, Backspace, Space and other switches, and a 3-position numeric display.

Printer -- line printing is from engraved characters on a revolving belt. Included as standard is one interchangeable print belt (either 45, 64 or 94 character set) ... see "Specify" variable width forms tractor for feeding continuous forms up to 15 inches wide, paper jam detection, and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 8 per inch. Maximum print lines is 127 lines per page. Refer to GA24-3488 for printer designs considerations.

Buffers -- transfer data between the input and output devices and the communication line. The buffers also transfer data between input and output devices during offline operation. The buffers alternate in providing input and output service to permit overlap operation. Dual 256-byte or dual 512-byte buffers are used for BSC or SDLC operation and are under operator control.

Printer Format Controls -- facilitate the formatting of printed data. Vertical and horizontal control characters in data initiate vertical or horizontal tabbing.

Compression/Expansion -- provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from cards and diskette. A two-byte sequence is substituted for each occurrence of three or more consecutive blank bytes (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 63 consecutive blank bytes are read. The terminal monitors received non-transparent data that is destined for the printer or attached card punch and automatically expands this two-byte sequence to the correct number of blanks. SDLC implementation provides a compression option that can be invoked at the terminal for a job that reads data from cards or diskette. An identifying sequence is substituted for each occurrence of two or more consecutive duplicate characters. The terminal automatically expands the compression sequences to the correct number of blanks or duplicate characters for compressed transparent or non-transparent data received.

Transmission Reversal -- permits keyboard initiation of interrupt of host data transmission for terminal data transmission and for resumption of the host transmission upon completion of the terminal transmission. This function is dependent upon associated host programming.

Record Compress -- using two special feature diskette storage devices permits offline compression of Basic Exchange diskette records onto a single diskette for subsequent batch transmission. The compressed records are written on the 3776 diskette in 3776 mode. Record Compress using one diskette storage device permits the compression of Basic Exchange diskette records into blocks of 256 bytes or 512 bytes for transmission.

Dual Data Path -- provides for concurrent operation of a line-to-line printer job and a card reader-to-diskette, or diskette-to-card punch, or diskette-to-card diskette job. The line-to-printer job uses either the dual 512-byte or single 512-byte alternating buffer to accept data from the line and transfer it to the printer. A single 256-byte or single 512-byte buffer is used for data buffering between card I/O and diskette or diskette and diskette. Throughput for both online and offline jobs is degraded when run concurrently using dual data path.

Automatic Card to Line Job -- when an online job is completed and the 3776 goes into Standby Status, a reader-to-line job is automatically started. The Start-Job procedure is not required when the terminal has a 2502 Card Reader and it is in ready status.

Input/Output Form Definitions -- can be operator or terminal defined. Up to five operator defined forms can be read from diskette or card reader to facilitate rapid job set-up when the terminal is equipped with either of the special features, otherwise they can be entered from keyboard. Printer format controls can be a part of the job definition. An appropriately configured 3776 will permit input/output job designation as follows:

**Offline Jobs**

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Diskette</td>
<td>Printer, Diskette or Card Punch</td>
</tr>
<tr>
<td>(1) Card Reader</td>
<td>Printer, Diskette or Card Punch</td>
</tr>
</tbody>
</table>

**Online Batch Jobs**

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Diskette or Card Reader</td>
<td>Line</td>
</tr>
<tr>
<td>(1) Line</td>
<td>Printer, Diskette or Card Punch</td>
</tr>
</tbody>
</table>

**Dual Data Path Jobs**

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) Line</td>
<td>Printer</td>
</tr>
<tr>
<td>(2) Card Reader</td>
<td>Diskette</td>
</tr>
<tr>
<td>(2) Diskette</td>
<td>Card Punch</td>
</tr>
<tr>
<td>(2) Diskette</td>
<td>Diskette</td>
</tr>
</tbody>
</table>

(1) One input device and one output device per job.
(2) Line to printer occurs concurrently with card reader to diskette or diskette to card punch or diskette.

**Performance Considerations** -- actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms stripping, application processing, etc., must all be considered in determining actual throughput. See IBM 3770 Data Communication System, GA27-3097, for additional information.

**Problem Determination Procedures:** Significant function has been designed into this unit to help provide greater availability to the customer. This has been done through the use of problem identification routines and procedures that are easily understood and used by the operator. See IBM 3776 Operating Procedures Guide, GA27-3107.

**Customer Responsibilities:** It will be a customer’s responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

**Communications:** See "Special Features." Transmission speeds up to 4800 bps over switched or non-switched facilities are allowed by selecting the appropriate modem and communication facility. Refer to 3770 Data Communication System in "Systems" for a Communication Configurator. Refer to M 2700 pages for information on customer responsibilities, communication facilities, and other attachment information. Also refer to 3863, 3864, 3872, and 3874 in "Machines." The 2400 BPS Integrated Modem and IBM 3872 Modem when appropriately configured can be intermixed on the same communication facility. The 4800 BPS Integrated Modem and IBM 3874 Modem when appropriately configured can be intermixed on the same communication facility.

**Supplies:** For mdl 1 or 2, a black ribbon, Part No. 113668, or equivalent, is required. Alternate Part No. 1299160, or equivalent, incorporates a twist in the ribbon which may improve ribbon life if the major portion of printing is in the first 60 print positions.

**Limitations:** The input/output capabilities outlined under "Highlights" are dependent on appropriate configurations of the terminal. Keyboard and printer are standard. For other configurations refer to "Special Features" below.

**Prerequisites:**

For SDLC Communications with S/370 or 4300 Processor -- a 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage of the S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or these operating systems running under VM/370 (OS/VS2 not supported by the 4300 Processors).
3776 Communication Terminal - Models 1 and 2 (cont'd)

For BSC Communications with S/360, S/370 or 4300 Processors -- a virtual storage S/370 or 4300 Processor operating under DOS/VS, OS/VS1 or OS/VS2; or under RSCS and VM/370, or any of these operating systems running under VM/370 (OS/VS2 is not supported by the 4300 Processors). The 3776 Communications Terminals use 2770/3780 BSC programming support when operating in BSC mode. Operation with S/360, S/370 or 4300 Processors using 2770/3780 BSC programming is also permitted. See SRL GA27-3097 for BSC compatibility considerations. The customer may have to modify existing 2770/3780 application programs for operation with 3776 BSC attachment can be via a 3704/3705 Communications Controller, or a 2701 Data Adapter Unit attached to a channel of any S/370 or 4300 Processor; or via an Integrated Communications Adapter on S/370 mdl 115, 125, 135, 135-3 or 138; or via a Communications Adapter feature on the 4331 Processor. BSC attachment can be made via a 3704/3705 attached to a channel of a S/360 mdl 30, 40, 50, 65, 67 (in 65 mode), 75 or 195; or via a 2701 attached to a channel of a S/360 mdl 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode), 75 or 195; or via an Integrated Communications Attachment on S/360 mdl 25.

Bibliography: GC20-0001.

Specify: [1] Voltage (115 V AC, 1-phase, 2-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray. Note: Available at time of manufacture only.

[3] Remote Power Off: #9501 ... this specify feature can be used to conserve energy used by the terminal by providing the capability for the host CPU application program to initiate power down at the terminal by sending a controlled data sequence over communication facilities. The terminal must also be equipped with the appropriate communication special features. This capability is in addition to the standard power down switch which can be manually operated.

[4] Print Belt Character Set: Specify one for shipment with the 3776 (available at time of manufacture only). See Print Belts in M 10000 pages for print belts available in addition to belt specified on order entry.

#9489 - 48 Character Set EBCDIC (HN Character Set)**
#9490 - 48 Character Set EBCDIC (Standard Character Set)**
#9491 - 64 Character Set EBCDIC
#9492 - 94 Character Set EBCDIC
#9493 - 48 Character Set ASCII*
#9494 - 64 Character Set ASCII*
#9495 - 94 Character Set ASCII*

** ASCII Feature (#1201) is required.

* These belts are identical except for the following special character differences:
#9499 has ( ) = #9490 has % # @

Print belts are interchangeable by the operator. The internal code structure adapts to the belt installed as follows:

Data Stream Character Printed Character
#9489 (HN Specified)
HN Belt Installed ) ( = ) ( =
HN Belt Installed % # @ ) ( =
Standard Belt Installed ) ( = % # @
Standard Belt Installed % # @ % # @

#9490 (Standard Specified)
Standard Belt Installed % # @ % # @
Standard Belt Installed ) ( =
HN Belt Installed % # @
HN Belt Installed ( =


MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

Model 1 to Model 2 ... $3,000*
Model 1 to Model 3 ... $11,000*
Model 1 to Model 4 ... $14,000*
Model 2 to Model 4 ... $11,000*

* Customer price quotations and customer order acknowledgment letters for purchase must state: "Installation of this model change involves removal of parts which become the property of IBM."

SPECIAL FEATURES

All special features can be field installed, except #1201 for which field installation is not recommended.

For Communication Capability -- select one Communication Feature (#1460, 1461 or 1470); a Communication Driver (#1481); one Integrated Modem (#5600, 5602, 5610, 5700, 5702, 5710) or EIA Interface (#3701). #1482 is required in addition to #1460 or #1461 for multipoint operation using BSC.

COMMUNICATION FEATURE ... one can be selected.

SDL/C/BSC, SWITCH CONTROL (#1460). Provides communication procedure using SDLC or BSC under operator switch control. SDLC allows point-to-point or multipoint operation. BSC operation is point-to-point without #1462, multipoint with #1462. Maximum: One. Limitation: Cannot be installed with #1461 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

BSC, POINT-TO-POINT (#1461). Provides for point-to-point BSC operation over switched or non-switched facilities. Maximum: One. Limitation: Cannot be installed with #1460 or #1470. See SRL GA27-3097 for BSC compatibility considerations.

SDDL (#1470). Provides for switched and non-switched SDLC procedures. For record purposes, also identify the primary CPU/Program Environment code. Specify one of the following: #9577, for DOS/VS VTAM, #9578 for OS/VS VM, #9592 for OS/VS2 VTAM, or #9993 for all other combinations of operating systems and access methods. Maximum: One. Limitation: Cannot be installed with #1460 or #1461.

BSC MULTIPORT (#1462). Required for BSC multipoint operation over non-switched facilities. Maximum: One. Prerequisite: #1460 or #1461. Limitation: See SRL GA27-3097 for BSC compatibility considerations.

COMMUNICATION DRIVER WITHOUT BUSINESS MACHINE CLOCKING (#1481). Provides communication driver without clocking. Maximum: One. Prerequisite: Communication Feature (#1460, 1461 or 1470).

EIA INTERFACE OR INTEGRATED MODEM ... one can be selected.

EIA INTERFACE (#3701). Provides an EIA RS-322C compatible interface and a cable for attachment of an IBM or other modem. Speeds up to 4800 bps for switched or non-switched facilities are permitted. This feature in combination with #1481 can be used to attach to Modem Fan-out (#3901) on an adjacent terminal, or on any of the following: an IBM 3661, 3664, 3672 or 3872 Modem. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with any Integrated Modem feature.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, POINT-TO-POINT (#5600). This self-clocked modem provides for point-to-point operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, NON-SWITCHED, MULTIPOINT (#5602). This self-clocked modem provides for multipoint operation over non-switched communication facilities. Operator controls provide for half-speed operation and for adjusting transmit and receive equalization. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701 or with another Integrated Modem.

2400 BPS INTEGRATED MODEM, SWITCHED WITH AUTO ANSWER (#5610). This self-clocked modem provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. Operator controls provide for half-speed operation. Maximum: One. Prerequisite: Communication Driver (#1481). The user must provide a Data Coupler type CBS or equivalent. Limitation: Cannot be installed with #3701, or with another Integrated Modem.

SUB-FEATURES FOR 2400 BPS INTEGRATED MODEMS

SWITCHED NETWORK BACK-UP (#7951). Provides the capability...
COMMUNICATION TERMINAL - MODELS 1 AND 2 (cont'd)

DP MACHINES

SUB-FEATURES FOR 4800 BPS MODEMS

for 94 character

storage features

Keyboard. This feature also provides for operation with diskette

--

the switched network facility as a back-up to the primary

network.

3115 or 3125. Note: To use this feature, operator intervention

may be required at the using system. This

Prerequisites:

Modem equipped for operation over the public switched network

or 5602). Equips the 2400 BPS Integrated Modem (5600 or 5602)

with the capability to be shared by up to two other terminals in addition to the host.

Maximum: One. Prerequisite: #5602. Limitation: This feature

can be used at a tributary station in a centralized multipoint network.

In this configuration, BSC multipoint programming discipline or SDLC non-switched programming discipline will provide

the selection/control of the terminal without any additional user involvement.

4800 BPS INTEGRATED MODEM, NON-SWITCHED, POINT-TO-POINT (#5700).

This self-clocked modem provides for point-to-point operation over 4-wire non-switched communication facilities. This modem features automatic equalization and manual half-speed select. Maximum: One. Prerequisite: Communicating Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

4800 BPS INTEGRATED MODEM, NON-SWITCHED, MULTI-POINT (#5702). This self-clocked modem provides for multiple point-to-point operation over 4-wire non-switched communication facilities. This modem features automatic equalization and manual half-speed select. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

4800 BPS INTEGRATED MODEM, SWITCHED, WITH AUTO ANSWER (#5710). This self-clocked modem provides for point-to-point operation over switched network facilities using manual originate/auto answer for establishing connection. This modem features automatic equalization and manual half-speed select. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with #3701, or with another Integrated Modem.

MODFAN-OUT (#3901).

Equips the 2400 BPS Integrated Modem. Non-Switched, Multipoint (#5702) with the capability to be shared by up to two other terminals in addition to the host. Maximum: One. Prerequisite: #5602. Limitation: This feature can be used at a tributary station in a centralized multipoint network. In this configuration, BSC multipoint programming discipline or SDLC non-switched communication discipline will provide the selection/control of the terminal without any additional user involvement.

SUB-FEATURES FOR 4800 BPS MODEMS

SWITCHED NETWORK BACK-UP (#7952).

Switches the network back-up facility to the switched network facility as a back-up to the primary non-switched facility. Operation over the switched network is in manual originate/answer mode to establish a transfer operation. It can communicate at 4800/2400 bps with an IBM 3874 modem equipped for operation over the public switched network (#7941, 7951 or 7952) attached to a 3704, 3705 or IC-A of a 3115 or 3125. Note: Use this feature, operator intervention at the terminal is required. Operator intervention, program modification, or both, may be required at the using system. This feature can be used with BTAM programs for DOS/VS, VS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required in existing BTAM programs to fully utilize the capabilities of this feature. Maximum: One. Prerequisites: 2400 BPS Integrated Modem (#5600 or 5602).

This user must provide a Data Coupler type CDT or equivalent. Limitation: Cannot be installed with #3701.

MODFAN-OUT (#3902).

Equips the 4800 BPS Integrated Modem. Non-Switched, Multipoint (#5702) with the capability to be shared by up to two other terminals in addition to the terminal containing the integrated modem. Maximum: One. Prerequisite: #3701. Limitation: This feature can be used at a tributary station in a centralized multipoint network. In this configuration, BSC multipoint programming discipline or SDLC non-switched communication discipline will provide the selection/control of the terminal without any additional user involvement.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with diskette storage features (ASCII is written on the diskette) and with BSC features #1480, 1481 or 1482 or with SDLC features #1460 or #1472. Orders for #1201 must also specify one print belt, one 48 character ASCII, #9494 for 64 character ASCII, or #9495 for 94 character ASCII. Maximum: One. Field Installation: Not recommended.

AUDIBLE ALARM (#1390). Sounds an alarm that alerts the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. Maximum: One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. Maximum: One. Limitation: The keys provided for this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys, for both the front and rear doors of the cabinet. Maximum: One. Prerequisite: Diskette Storage, 2nd (#4902). Limitation: The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

FRONT FEED (#3951). Enables the operator to insert paper forms in the front or rear of the machine. A forms entry chute is provided under the keyboard and front loading. The paper supply is placed on the floor either under the keyboard in the front of the machine for front loading, or underneath the forms enclosure for rear loading.

FORMS STAND Integrated Modem for #3701 and 2.

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. Maximum: One.

DISKETTE STORAGE, 1ST (#4901). One device with a customer removable diskette is placed in the left cabinet. Additional diskettes are available from IBM. The characteristics of the diskette storage device are: one movable read/write head; one read/write surface; 73 data tracks; 26 sectors per track and 258 bytes per sector. In configuration #3901, or #474 512-byte records can be stored on the diskette (one 256-byte data record is reserved for forms control information). Each 256-byte record is stored in two consecutive numbered sectors in interchange mode, or in two non-consecutive sectors in 3770 mode. Each 512-byte record is stored in four consecutive sectors in interchange mode, or four non-consecutive sectors in 3770 mode. Diskette data is code insensitive in SDLC mode, non-transparent only in BSC mode. Maximum: One.

DISKETTE STORAGE, 2ND (#4902). Provides a second diskette storage device with the same characteristics as the 1st. It is placed in the right desk cabinet which is also supplied by this feature. The second diskette allows additional capabilities for:

Copy -- data can be copied from diskette 1 to diskette 2 (single data set or all active data sets -- 3770 mode only).

Concatenate (pool) -- the ability to concatenate on a data set basis.

Continue -- allows a read or write operation to automatically continue to diskette 2, if it has been placed in ready condition.

Maximum: One. Prerequisite: Diskette Storage, 1st (#4901). Orders for Field Installation: Must specify color -- #9081 for red, #9082 for yellow, or #9083 for blue. Color must be the same as that specified for the base machine.

OPERATOR ID FEATURE (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read. With BSC, a read operation can be initiated directly from the terminal. Additional customer program routines will be required in existing programming to fully utilize the capabilities of this feature. Maximum: One. Limitations: [1] The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation ... [2] BSC programming for 2770 and 3760 does not support this feature.

3501 CARD READER ATTACHMENT (#8050). To attach a 3501 Card Reader. Maximum: One. Limitation: Cannot be installed with 3782/2502 Card Reader Attachment (#8149). If a 3521 is also attached (#8150), the Card Read/ Punch Check special feature is limited to the punch checking function only.

3782/2502 CARD READER ATTACHMENT (#8149). To attach a 3782 Card Attachment Unit mdl 2 and a 2502 Card Reader mdl A1 or A2. Maximum: One. Limitation: Cannot be installed with 3501 Card Reader Attachment (#8050). If a 3521 is also attached (#8150), the Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. Maximum: One. Limitation: If a 2502 or 3501 Card Reader is also attached (#8149 or 8050), the Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.

Not to be reproduced without written permission.
### Special Feature Prices:  

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC 2 Yr Purchase</th>
<th>MMMC</th>
</tr>
</thead>
</table>

#### Communication Feature

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC 2 Yr Purchase</th>
<th>ETP/</th>
<th>MAC/</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDLC/BSC, Switch Ctrl</td>
<td>#1460</td>
<td>$25</td>
<td>$21</td>
</tr>
<tr>
<td>BSC, Pt-to-Pt</td>
<td>1461</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>SDLC</td>
<td>1470</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>BSC Multipoint</td>
<td>1462</td>
<td>13</td>
<td>11</td>
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#### Communication Driver

<table>
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</thead>
<tbody>
<tr>
<td>w/o Bus Mch Clocking</td>
<td>1481</td>
<td>13</td>
</tr>
<tr>
<td>EIA interface</td>
<td>3701</td>
<td>13</td>
</tr>
</tbody>
</table>

#### 2400 BPS Integrated Mode

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC 2 Yr Purchase</th>
<th>ETP/</th>
<th>MAC/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Switched, Pt-to-Pt</td>
<td>5600</td>
<td>68</td>
<td>58</td>
</tr>
<tr>
<td>Non-Switched, Multipoint</td>
<td>5602</td>
<td>74</td>
<td>63</td>
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</tbody>
</table>

#### 4800 BPS Integrated Mode

<table>
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<th>Feature</th>
<th>MRC 2 Yr Purchase</th>
<th>ETP/</th>
<th>MAC/</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Switched, Pt-to-Pt</td>
<td>5700</td>
<td>141</td>
<td>120</td>
</tr>
<tr>
<td>Switch Ntwk Backup</td>
<td>7951</td>
<td>11</td>
<td>9</td>
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<tr>
<td>Switch Ntwk Backup</td>
<td>7952</td>
<td>24</td>
<td>20</td>
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</tbody>
</table>

#### ASCII Feature

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC 2 Yr Purchase</th>
<th>ETP/</th>
<th>MAC/</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCII Feature</td>
<td>1201</td>
<td>18</td>
<td>15</td>
</tr>
</tbody>
</table>

#### ACCESSORIES:

The following items are available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 for additional information and field installation.

Print Belt, Add’l (#5811, #5812, #5813, #5820, #5821, #5822, #5823) -- Permits the customer to obtain more than one character set print belt for various applications.

- 48-character ASCII (#5811)*
- 64-character ASCII (#5812)*
- 94-character ASCII (#5813)*
- 48-character EBCDIC (HN Character Set) (#5820)
- 48-character EBCDIC (Standard Character Set) (#5821)
- 64-character EBCDIC (#5822)
- 94-character EBCDIC (#5823)

* ASCII Feature (#1201) is prerequisite.
Purpose: The 3776 is a medium speed remote job entry terminal and is a member of the 3770 Data Communication System. The 3776 model 3 and 4 are SNA Multiple Logical Unit (MLU) terminals. A keyboard and a console display are used for terminal control and for operator communication with the host CPU. Terminal operation is controlled by the storage of operational facilities, terminal setups and local utility programs in terminal storage for use by the terminal operator. The 3776 is not designed as an interactive terminal. Each terminal operator contains an engraved character font belt (48, 64 or 94 character set) which can be interchanged by the operator. A special feature for paper insertion from either the front or rear of the machine. Specialized software permits one or two diskette storage devices, one magnetic tape unit, one card reader and one card punch. One of three card readers can be selected for operation at speeds of 150, 300 or 400 cards per minute. The card punch operates at 50 cpm.

Maximum Lines per Minute Character Set
Model 3 300 48
230 64
160 94

Model 4 400 48
300 64
230 94

Highlights:

Communications — transmission speeds from 2400 bps to 9600 bps and at 19.2K bps are provided using the appropriate mode and communications facilities. Duplex — simultaneous inbound/outbound — data transmission is provided on non-switched full duplex communication facilities only when communicating with an appropriately equipped 3705 Communications Controller with the supporting ACF/NCP/VS level. May also be locally attached in either a duplex or half duplex mode to a 3705 at 14.4K bps.

Keyboard — EBCDIC arrangement with 44 data keys. The keyboard in conjunction with a standard console display, indicator lights, function keys, operating mode switches and a 3-position numeric display provides operator control. Host application commands, System Services Control Point (SSCP) commands and local functions are entered from the keyboard. Data entered on the keyboard is displayed. If a keying error is made, Character Backspace and Character Advance may be used for editing. Character Backspace and Advance are non-destructive. Character Advance is typematic. Reset returns to the position from which the Character Backspace began.

Console Display — contains 16 lines of 64 characters each for a total of 1024 characters. The 3776 mdl 3 and 4 reserve the bottom three lines of the display for operating keying, display of system information and prompting for information required for the execution of functions. The remaining 13 lines of the display are used to display messages between the terminal and the host application or the SSCP and to display information regarding terminal operations such as host input.

Lower case alphabets are converted to upper case before displaying. When the cursor is beneath a character, any new data keystroke will cause the new character to replace the old. Overstrikes are not permitted.

Each message is displayed as it is received except as described below. Each message is also written in terminal storage. At power-on time, the operator is prompted to specify date and time. As messages are received they are time-stamped prior to display and storage. Messages longer than a display line will wrap around to the next line with an indent to aid readability. The display fills from top to bottom. Subsequent new message lines replace the oldest message lines. The most recent message received is identified by the Greater Than sign > in the first position. The following line is blanked to assist the operator with message identification.

Function keys on the keyboard allow the operator to control the display function. The display can be held while incoming messages are sent to terminal storage and not displayed. If messages arrive during the 'hold' state, a message alert light notifies the operator. The operator may subsequently display the desired message group. A terminal utility program is available for listing or copying the message contents of terminal storage for external message retention and reference.

Printer — line printing is from characters engraved on a revolving belt. Included as standard is one interchangeable print belt (either 48, 64 or 94 character set) ... see "Specify." Also standard are a variable width forms tractor for feeding continuous forms up to 15" wide ... paper jam detection ... and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 8 lines per inch. Maximum print lines is 127 lines per page.

Terminal Storage — is standard for message spooling, terminal control, utility programs and user generated procedures.

Diskette Storage — there are two diskette storage devices available as special features. While the devices are physically identical to those on the 3411 mdl 1 and 2, their operational facilities such as data set concatenation enhance the use of the special feature diskette storage devices. Also each special feature diskette storage device may be assigned individually to an independent host SNA session or used locally for input or output. Diskette operation is concurrent with other terminal functions.

Magnetic Tape — may be used as either an input or as an output device. One 3411 Magnetic Tape Unit and Control mdl 1 attachment is available as a special feature. The 3411 mdl 1 provides 9-track tape with recording densities of 1600 bpi Phase Encoded or 800 bpi NRZI. 7-track tape operation is not provided. The 3411 mdl 1 may be assigned to an independent host SNA session or used locally for input and output. Labeled and unlabeled tapes are supported. The correct number of blanks or duplicate characters length and may be unblocked or blocked to a maximum block size of 4000 bytes. Maximum record size is 255 bytes. A block size of up to 2000 bytes automatically provides dual buffering. Magnetic tape operation is concurrent with other terminal functions. Refer to G232-0004 for detailed information on the operation of the 3411 mdl 1.

Buffers — transfer data between the input and output devices and the communication line. SDLC communications uses a customer defined Request/Response Unit (RU) of up to 512 bytes. The actual transmission is dependent on session pacing values, data length, buffer availability and data availability. Buffers also transfer data between input and output devices during local operation.

Printer Format Controls — facilitate the formatting of printed data. Vertical control characters in data initiate vertical tabbing. Carriage control definition provides for specification of a variable number of line numbers per carriage stop with a maximum of 80 lines per carriage stop. Control definitions may be defined at the terminal or may be sent dynamically by the host application. Extended Forms Definition is standard and uses terminal storage.

Compression/Expansion — implementation provides a compression option at the terminal for a job that reads data from cards, magnetic tape, or diskette to the line. An identifying sequence is subtracted for each occurrence of consecutive duplicate characters. Trailing blank truncation is standard. The terminal automatically expands the compression sequence to the correct number of blanks or duplicate characters for compressed transparent or non-transparent data received.

Decompression — provides the decompression function associated with the receipt of a compacted data stream whereby a pair of consecutive alphameric characters is represented by a single transmission byte. Function depends upon transmission by the host of a decompression table corresponding to the compaction table used by host programs in creating the compacted data stream. Decompression occurs for data directed to the printer, card punch, magnetic tape and diskette (except 3770 format). Compaction by the terminal of data inbound to the host is not provided.

Automatic Card Reading — capability is under control of the operator. The "hot reader" function may be enabled/disabled at any appropriate operational level.

Job Control — initiated by the operator, pertains to online jobs with the host and local utility jobs run concurrently with the online jobs. Online job submission may be initiated at any time there is an SNA session available for data transmission. The terminal may have up to six concurrent sessions that are controlled by the operator. Online job input must consist of cards, diskette or magnetic tape data. Data from different devices or data sets may be concatenated into a single input data stream as one job execution. Online job output may consist of printer, card, diskette or magnetic tape data.

Local utility jobs may be defined by the operator and stored in terminal storage to provide the following functions:

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Card</td>
<td>Printer, Magnetic Tape, Diskette, Card Punch</td>
</tr>
<tr>
<td>Magnetic Tape</td>
<td>Printer, Diskette, Card Punch</td>
</tr>
<tr>
<td>Diskette</td>
<td>Printer, Magnetic Tape, Diskette, Card Punch</td>
</tr>
</tbody>
</table>

Record Formats — consist of card image, print image and 3770 format. Card image and print image, in addition to being applicable to card reader, card punch, printer and magnetic tape data sets, are also applicable to diskette as a function of Basic Exchange datasets (128 byte maximum).
Basic Exchange diskettes may be written by the terminal, thereby creating a diskette for further Basic Exchange mode processing.

3770 Format is applicable to diskette data recording which is to be subsequently printed or punched. 3770 format recording results in diskette content that does not contain card or print image. Basic Exchange (card or print image) or 3770 Format is a user specification in job control.

Input record size from both magnetic tape and diskette may be limited to 80 or 128 bytes, because of host programming considerations. In addition, the ability to concatenate multiple data sets, with different record lengths, into a single input job stream requires host programming support of a CDS-FM Header type 1 (Continue Destination Select).

Remote Power Off -- see #9501 under “Specify” below.

Encrypt/Decrypt Feature -- see #3680 under “Special Features.” Available to provide secure data transmission in conjunction with ACF VTAM Encrypt/Decrypt Feature (Program Number 5736-RC2) (Feature Number 6010) and Programmed Graphic Facility Program Product (Program Number 5740-XY5).

Performance Considerations -- the line-to-printer performance of the 3776 mdl 3 is up to 300 lpm with a 48-character set print belt. The line-to-printer performance of the 3776 mdl 4 is up to 400 lpm with a 48-character set print belt.

The 3776 mdl 3 and 4 MLU terminals will operate, however, with concurrent input/output processing in either a half-duplex or duplex communications mode as a function of the base Multiple Logical Unit capability. The card reader, punch, diskette storage devices, magnetic tape unit and display console may have a degraded effect on printer performance during concurrent operations. The degree of degradation which may occur will tend to be greater when half-duplex communications are employed as opposed to duplex communications and system facilities in support of the concurrent inbound-outbound data stream capability of the terminal.

Actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, SNA pacing, cryptographic processing, etc., must all be considered in determining actual throughput.

In general, duplex data communications operation will tend to provide greater terminal throughput under concurrent input/output functions than a half-duplex communications mode.

The 3776 mdl 3 or 4 operating duplex at 19.2K bps on a terrestrial link may, however, present a variance of from greater to degraded overall terminal throughput when compared to comparable operation in a half-duplex mode.

Problem Determination Procedures: Function has been designed into this unit to help provide availability to the customer. See IBM 3776 Multiple Logical Unit Operator’s Guide for 3776-3, 3776-4, 3777-3, GA27-3125.

Customer Responsibilities: It will be a customer’s responsibility to use and follow the Problem Determination Procedures and to fill out the trouble report prior to calling IBM for service. Also refer to the M 2700 pages.

Communications: See “Special Features,” Transmission speeds from 2400 bps to 9600 bps and at 19.2 Kbps. Point-to-point and multipoint transmission capability over switched or non-switched facilities is allowed by selecting the appropriate modem and communication facilities. Speeds above 4800 bps are on non-switched facilities. Direct local attachment to 3705 at 14.4K bps, EBCDIC is the standard transmission code. ASCII is available as a special feature. Refer to M 2700 pages for information on customer responsibilities, communication facilities and other attachment information.

For 19.2 Kbps, the 3776 mdl 3 or 4 may use either the EIA Interface or the High Speed Digital Interface special feature to communicate through an appropriate modem and communication facility with a 3704/3705 Communications Controller equipped with a Line Set Type 1G (#4717) at the central processing unit. This type of communication requires modems which are line compatible (suitable for interconnection) and which provide optional EIA RS232C or High Speed Digital Interface DTE interfaces. Also attaches via the Communications Adapter feature on a 4331 Processor... see 4331 Multiple Logical Unit.

IBM Modems: The following IBM modems can be used: 3863 (2400 bps), 3864 (4800 bps) or 3865 (9600 bps). Note: 4-wire Switched Network Backup is available on the 3865 mdl 1, 3864 mdl 1 or 3865 mdl 1 or 2. For communications capability, product utilization and features, see 3863, 3864, 3865 and M 2700 pages.

Supplies: For a 3776 mdl 3 or 4, a black ribbon, Part No. 1136670, or equivalent, is required. Alternate Part No. 1299160, or equivalent, incorporates a twist in the ribbon which may improve ribbon life if the major portion of printing is in the first 60 print positions.

Limitations: The input/output capabilities outlined under “Highlights” are dependent upon appropriate configurations of the terminal. Keyboard, console display, terminal storage and printer are standard. One communications feature (#3701, 4501, 5650 or 5651) is required. For other configurations, refer to “Special Features” below. The duplex data communications capability of the 3776 mdl 3 or 4 is operational on non-switched full duplex communications facilities only.

Communications Adapter: An integrated communications adapter without business machine clocking is standard... provides SDLC communications over switched or non-switched facilities.

Prerequisites for SDLC Communications with S/370 or 4300 Processors: A 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 or 4300 Processor operating under VS1, MVS or DOS/VS using RES, JES2, JES3, POWER/VS or VTAM. Note: MVS and JES3 are not supported on 4300 Processors.

An appropriately featured 3705 operating under the appropriate level of Network Control Program (ACF/NCP/VS) is required for duplex data stream operation.

Bibliography: GC20-0001

- SPECIFY
- ** Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug. See 3411 mdl 1 for magnetic tape unit voltage requirements.
- Remote Power Off: #9501 ... this specify feature can be used to conserve energy used by the terminal by providing the capability for the host CPU application program to initiate power down at the terminal by sending a controlled data sequence over communication facilities. The terminal must also be equipped with the appropriate communication special features. This capability is in addition to the standard power down switch which can be manually operated.
- Print Belt Character Set: Specify one. Available at time of manufacture only ... specify for print belt to be shipped with machine. See Print Belts in M 10000 pages for print belts available in addition to belt specified on order entry. Print belts are interchangeable by the operator.
- #9894 -- 48 Character Set EBCDIC (HN Character Set) *
- #9490 -- 48 Character Set EBCDIC (Standard Character Set) **
- #9491 -- 64 Character Set EBCDIC #9492 -- 94 Character Set EBCDIC #9483 -- 46 Character Set ASCII **
- #9484 -- 64 Character Set ASCII #9495 -- 94 Character Set ASCII **

* These belts are identical except for the following special character differences:
  #9489 has ! = #9490 has % @ **
  ASCI Feature (#4100) is required.
- Cables ... fixed length cables except for the 3411 Magnetic Tape Unit and Control are provided as standard. See Installation Manual - Physical Planning, GA27-3006. 3411 cables must be ordered separately.
- EIA RS232C 1.92 Kbps Line Speed: #9481 ... provides support of 19.2 Kbps. Used for record purposes.
- Alternate Address: #9011

Order this optional feature to specify that diskettes containing terminal control code updates are to be mailed to an alternate address. Teleprocessing using a Teleprocessing Control Number (TCP). The alternate address selected is usually the central site location.
- Color: Blue is supplied as standard except for field model conversions where installed color groups will be matched (do not specify).

PRICES: Mdl 3 MRC 2 Yr Purchase MMC

| Mdl 3 | $811 | $750 | $30,000 | $265 |
| 4 | 996 | 925 | 33,000 | 281 |

Plan Offering: Plan B Machine Group: 30000 per Call: 1 Warranty: B Purchase Option: 45% Useful Life Category: 2 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

Model Changes: Field installable.

Not to be reproduced without written permission.
MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

- Model 1 to Model 3 ... $ 11,000*
- Model 1 to Model 4 ... $ 14,000*
- Model 2 to Model 4 ... $ 11,000*
- Model 3 to Model 4 ... $ 3,000*

* Customer price quotations and customer order acknowledgment letters for purchase must state:

"Installation of this model change involves removal of parts which become the property of IBM."

SPECIAL FEATURES

All special features can be field installed, except #1201 for which field installation is not recommended.

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphics) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with diskette storage features (ASCII is written on the diskette). Orders for #1201 must also specify one print belt, #5493 for 48 character ASCII, #6494 for 64 character ASCII, or #7495 for 94 character ASCII.


AUDIBLE ALARM (#1390). Sounds an alarm that alerts the operator of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. Maximum: One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. Maximum: One. Limitation: The keys provided for this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. Maximum: One. Prerequisite: Diskette Storage, 1st (#4901). Limitation: The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

ENCRYPT/DECRYPT (#3680). Provides cryptographic data transmission in conjunction with program support in the host. Includes a security keylock. Each machine will have its own unique key. Two identical keys are supplied with the feature. Maximum: One. Note: A mercury battery, IBM Part No. 1743456 or equivalent, is required. A battery is shipped with this feature. See M 10000 pages for additional or replacement batteries. Replacement of the discharged battery is the customer’s responsibility.

EIA INTERFACE (#3701). Provides an EIA RS 232C compatible interface and a cable for attachment to a modem. Maximum: One. Limitation: Cannot be installed with DDS Adapter, Point-to-Point (#5650), DDS Adapter, Multipoint (#5651), High Speed Digital Interface (#4501) or V35 Interface (#4720).

Maximum: One. Limitation: For 19.2 Kbps operation, #9841 is required (ASCII). Maximum: One. Limitation: The host must be connected to a modem which permits point-to-point and multipoint synchronous operation at 19.2 Kbps on a Type 5703 or 6800 wideband channel. Maximum: One. Limitation: Cannot be installed with EIA Interface (#3701), DDS Adapter, Point-to-Point (#5650), DDS Adapter, Multipoint (#5651) or V35 Interface (#4720).

KEYLOCK (#4850). Provides a mechanical keylock to activate controls that disable all operator activity related to keyboard control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. Maximum: One.

V35 INTERFACE (#4720). Required for direct High Speed Local Attachment to a 3705-II at 14.4 Kbps with a maximum cable distance of 170 feet. Limitation: Cannot be installed with #5701, #4501, #5650 or #5651. Field Installation: Yes.

DISKETTE STORAGE, 1ST (#4901). One device with a customer removable diskette is placed in the left cabinet. Additional diskettes are available from IBM. Characteristics of the diskette storage device are: one moveable read/write head, one read/write surface, 73 data tracks, 26 sectors per track and 128 bytes per sector. Up to 1998 128-byte records. Data may be stored in either a Basic Exchange dataset, or in a 3770 format dataset. Diskette capabilities allow for:

- Concatenate (pool) -- the ability to concatenate on a data set basis.
- Multivolume -- allows a read or write operation to automatically continue to diskette 2 if it has been placed in ready condition, or it may continue on the current drive.

Maximum: One.

DISKETTE STORAGE, 2ND (#4907). Provides a second diskette storage device with the same characteristics as the first. It is placed in the right desk cabinet which is also supplied by this feature. The second diskette allows additional capabilities for:

- Copy -- data can be copied from diskette 1 to diskette 2.

Maximum: One. Prerequisite: Diskette Storage, 1st (#4901).

OPERATOR ID FEATURE (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. A 35 character card contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read. Data read from the magnetic stripe punch check see feature or displayed. Maximum: One. Limitations: The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation.

DDS ADAPTER (DDSA) (#5650 – For Point-to-Point Operation ... #5651 – For Multipoint Operation). Provides an adapter for SDLC data transmission at speeds of 2400, 4800 or 9600 bps over the AT&T non-switched Dataphone* Digital Service network. The DDSA interfaces to a DDS channel service unit, the customer site termination of the DDS network. Prerequisite: #5822 for 2400 bps, #5823 for 4800 bps, or #5825 for 9600 bps. Maximum: One, #5650 or #5651. Limitation: Cannot be installed with EIA Interface (#3701), High Speed Digital Interface (#4501) or V35 Interface (#4720).

3411 MAGNETIC TAPE UNIT AND CONTROL MDL 1 ATTACHMENT (#7801). To attach one 3411 Magnetic Tape Unit and Control mdl 1. Maximum: One. Prerequisite: Feature #7003 on the 3411 mdl 1.

3782/2502 CARD READER ATTACHMENT (#8149). To attach a 3782 Card Attachment Unit mdl 2 and a 2502 Card Reader mdl A1, A2 or A3. Maximum: One. Limitation: Optical Mark Read on the 2502 is not supported.

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 2 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. Maximum: One. Limitation: The Card Read/Punch Check feature on the 3521 is limited to the punch checking function only.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC 2 Yr</th>
<th>Purchase MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASCII Feature</td>
<td>$1201</td>
<td>$18 $15 $600</td>
</tr>
<tr>
<td>Audible Alarm</td>
<td>1390</td>
<td>40  .50</td>
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<tr>
<td>Door Keylock</td>
<td>3402</td>
<td>35 SU C - 15</td>
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<tr>
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<td>3402</td>
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<td>Encrypt/Decrypt</td>
<td>3680</td>
<td>47  40 1,600</td>
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<td>4902</td>
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<td>5450</td>
<td>13  11 440</td>
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<td>5550</td>
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<td>8149</td>
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<tr>
<td>3782/3521 Cdt Pch Attach</td>
<td>8150</td>
<td>19  16 640</td>
</tr>
</tbody>
</table>

* Registered Trademark of AT&T.
ACCESSORIES: The following items are available on a purchase only basis. For shipment with machine, order the Feature No. or Part No. indicated below at the price listed in M 10000 pages ... see M 10000 pages for additional information and field installation.

Print Belt, Add'l (#5811, #5812, #5813, #5820, #5821, #5822, #5823) — permits the customer to obtain more than one character set print belt for various applications.

- 48-character ASCII (#5811)**
- 64-character ASCII (#5812)**
- 94-character ASCII (#5813)**
- 48-character EBCDIC [HN Character Set] (#5820)
- 45-character EBCDIC (Standard Character Set) (#5821)
- 64-character EBCDIC (#5822)
- 94-character EBCDIC (#5823)

** ASCII Feature (#1201) is prerequisite.

Mercury Battery (Part No. 1743456). Provides power to sustain the master key of the Encrypt/Decrypt feature (#3680) when normal power is not present. This accessory is a 4 volt non-rechargeable mercury battery. This battery has a shelf life of 1 year under normal conditions, and can be expected to provide 3.5 years of normal operation. Note: Discharged battery should be returned to IBM.
The Purpose: The 3777 mdl 1 is a high speed remote job entry terminal and is a member of the 3770 Data Communication System. A keyboard is used for terminal control and may be used for operator communication with the host CPU. A printer is used for output. The 3777 mdl 1 is not designed as an interactive terminal. The printer is not integrated into the 3777 mdl 1 but is a stand-alone 3203 Printer mdl 3 which is cable attached to the 3777 mdl 1. The 3203 mdl 3 uses the 1416 Interchangeable Train Cartridge which can be interchanged by the operator. Special features permit one or two diskette storage devices and provide for attachment of one card reader. One of three card readers can be selected for operation at 150, 300 or 400 cards per minute. A minimum configuration includes a 3777 Communication Terminal mdl 1 and a 3203 Printer mdl 3.

Communication features permit operation at speeds from 2400 bps to 9600 bps and at 19.2K bps using BSC or SDLT transmission techniques and an appropriate modem. Direct connection for operation at speeds from 1000 LPM speed Enhancement feature-information.

Maximum Lines Per Minute

Std 3203 mdl 3 Featured 3203 mdl 3 Character Set

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>1200</td>
<td>48AN, HN</td>
</tr>
<tr>
<td>870</td>
<td>1020</td>
<td>60 PN</td>
</tr>
</tbody>
</table>

See "Type Catalog" for additional character sets and speeds...

The 3777 mdl 1 allows a variety of character sets and speeds...

See 3203 for 1200 LPM Speed Enhancement feature information.

Highlights:

- Keyboard -- EBCDIC arrangement with 44 data keys (produces 88 characters). Underscore/Hyphen, Backspace, Space and Character Advance keys have typematic action. Associated with the keyboard are indicator lights, function keys, operating mode switches, and a 3-position numeric display.

- Printer -- a stand-alone 3203 Printer mdl 3 cable attached to the 3777. 3203 mdl 3 uses the 1416 Interchangeable Train Cartridge. The 3771 mdl 1 supports fifteen Print Train Arrangements (AN, HN, OAA, ODA, ONA, OAB, GN, PCS-AN, PCS-HN, PN, QNC, GN, RN, SN, TN) as standard. When a substitute character is ordered to displace a character in one of the standard arrangements, the substituted character assumes the card and bit codes of the character it replaces. See "Type Catalog." If the International Print Support specify feature (50351) is installed, the 3777 mdl 1 will support Print Train Arrangements corresponding to the 48, 64 and 94-character EBCDIC sets available for print belts for the 3776 Communication Terminal.

Support is also provided for the GN, HN, AN, PN, RN and PCS-HN arrangements. The 3203 mdl 3 permits feeding continuous forms up to 20 inches wide and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 8 per inch under operator control. Maximum print lines is 127 per page when attached to the 3777 mdl 1. Refer to the M 3203 whitepaper for further description of the 3203 mdl 3. Refer to "Type Catalog" for further description of the 1416 print train arrangements supported and for print speeds. Refer to GA24-3468 for forms design considerations.

- Buffers -- transfer data between the input and output devices and the communication line. The buffers also transfer data between input and output devices during offline operation. The buffers alternate in providing input and output services to permit overlapped operation. Dual 256-byte or dual 512-byte buffers are used for BSC or SDLT operation and are under central control.

- Printer Format Controls -- facilitate the formatting of printed data. Vertical and horizontal control characters in data initiate vertical or horizontal tabbing.

- Compression/Expansion -- provides a means for improving the efficiency of data transmission. For BSC, the compression option can be invoked at the terminal for a job that reads non-transparent data from card and diskette. A two-byte sequence is substituted for each occurrence of three or more consecutive blank bytes (63 consecutive blanks is the upper limit). A second two-byte sequence is appended if more than 63 consecutive blank bytes are read. The terminal monitors received non-transparent data that is destined for the printer and automatically expands the two-byte sequence to set of blanks. SNA/SDLT implementation provides a compression option that can be invoked at the terminal for a job that reads data from card or diskette. An identifying sequence is substituted for each occurrence of two or more consecutive duplicate characters. The terminal automatically expands the compression sequence to set of blanks and blank sequence. Various forms of compressed transparent and non-transparent data received.

Decompaction -- provides the decompaction function associated with the receipt of a compacted data stream whereby a pair of consecutive alphameric characters is represented by a single transmission byte. Function is dependent upon transmission protocol, and subsequent decompaction table corresponding to the compaction table used by host programming in creating the compacted data stream. Decompaction function is available only under SLCU or 3777 protocols. Decompaction occurs only for data directed to the printer. Compaction by the 3777 mdl 1 of data inbound to the host is not provided.

Transmission Reversal -- permits keyboard initiation of interrupt of direct serial transmission for terminal data transmission and for resumption of the host transmission upon completion of the terminal transmission. The function is dependent upon associated host programming.

Record Compress -- using two special feature diskette storage devices permits offline compress of Basic Exchange diskette records onto a single 3777 mdl 1 diskette for subsequent batch transmission. The compressed records are written on the 3777 mdl 1 diskette in 3770 mode. Record Compress using one diskette storage device permits the compression of basic exchange diskette records into blocks of up to 256 bytes or 512 bytes for transmission.

Dual Data Path -- provides for concurrent operation of a line-to-printer primary job and a card reader-to-diskette or diskette-to-diskette secondary job. The line-to-printer job uses either the 256-byte or dual 512-byte alternating buffers to accept data from the line for printing. A single 256-byte or single 512-byte buffer is used for data buffering between card and diskette or diskette and line-to-printer job. The primary line-to-printer job will not normally degrade during dual data path operation. The secondary job will degrade during periods of concurrent operation.

Automatic Card-to-Line Job -- when an online job is completed and the 3777 goes into Standby Status, a reader-to-line job is automatically started. The Start-Job procedure is not required provided the terminal has a 2502 Card Reader and it is in Ready Status.

Remote Power Off -- this feature can be used to conserve energy used by the terminal by providing the capability for the host CPU application program to initiate power down at the terminal by sending a controlled data sequence over communication facilities. The terminal must also be equipped with the appropriate communication special features. This capability is in addition to the standard power down switch which can be manually operated.

Input/Output Form Definitions -- can be operator or terminal defined. Up to five operator defined forms can be read from diskette or card reader to facilitate rapid job set-up when the terminal is equipped with either of the spacial features, otherwise they can be entered from keyboard. Printer format controls can be part of the job definition. An appropriately configured 3777 mdl 1 will permit input/output job designation as follows:

Offline Jobs

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Diskette</td>
<td>Printer or Diskette</td>
</tr>
<tr>
<td>(1) Card Reader</td>
<td>Printer or Diskette</td>
</tr>
</tbody>
</table>

Online Batch Jobs

<table>
<thead>
<tr>
<th>Online Batch Jobs</th>
<th>Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Diskette or Card Reader</td>
<td>Line Printer or Diskette</td>
</tr>
<tr>
<td>(1) Line</td>
<td>Printer or Diskette</td>
</tr>
</tbody>
</table>

Dual Data Path Jobs

<table>
<thead>
<tr>
<th>Dual Data Path Jobs</th>
<th>Line</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) Line</td>
<td>Printer</td>
</tr>
<tr>
<td>(2) Diskette</td>
<td>Diskette</td>
</tr>
<tr>
<td>(2) Diskette</td>
<td>Diskette</td>
</tr>
</tbody>
</table>

(1) One input device and one output device per job.
(2) Line to printer occurs concurrently with card reader to diskette or diskette.

Performance Considerations -- actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, etc., must all be considered in determining actual throughput. See IBM 3770 Data Communication System, GA27-309, for additional information.

Problem Determination Procedures: Significant function has been designed into this unit to help provide greater availability to the customer. This has been done through the use of problem identification routines and procedures that are easily understood and used by the operator. See IBM 3777-1 Operating Procedures Guide, GA27-3124.

Customer Responsibilities: It will be a customer's responsibility to follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Communications: See "Special Features." Transmission speeds not to be reproduced without written permission.
7377 Communication Terminal Model 1 (cont'd)
of up to 9600 bps and at 19.2K bps are allowed by selecting the
appropriate modem and communication facility. Direct local attac-
chment to a 3705-2 at 14.4K bps. Speeds above 4800 bps are on
non-switched facilities. Refer to 3770 Data Communication System
in "Systems" for a Communication Configurator. Refer to M 2700
pages for information on customer responsibilities, communication
facilities, and other attachment information.

For 19.2 Kbps, the 3777 mdl 1 may use either the EIA or the High
Speed Digital Interface to communicate through an appropriate
modem and communication facility with a 3704/3705 Communications
Controller equipped with a Line Set 1G (#4717) at the cen-
tral processing unit which types of communication requirements
which are line compatible (suitable for interconnection) and which
provide optional EIA or RS 232C or High Speed Digital Interface
DTE interfaces. Also attaches via a Communications Adapter
feature on the 4331 Processor ... see M 4331 pages for details.

IBM Modems: The following IBM Modems can be used: 3863 (2400
bps), 3864 (4800 bps) or 3865 (9600 bps). Note: 4-wire Switched
Network Backup is available on the 3863 mdl 1, 3864 mdl 1 and 3865
mdl 1 and 2. For communications capability, product utilization, and features,
see 3853, 3864, 3865 and M 2700 pages.

Supplies: 3203 mdl 3 ribs

Prerequisites:
For SDLC Communications with S/370 or 4300 Processor -- a
3704 or 3705 Communications Controller operating under Net-
work Control Program (NCP/VS) and attached to any virtual
storage S/370 or 4300 Processor outputting under OS/VS1 or OS/VS2;
or these operating systems running under VM/370. Note: OS/VS2 is not supported by the 4300 Pro-
cessors.

For BSC Communications with S/360, S/370 or 4300
Processor -- a virtual storage S/370 or 4300 Processor operating
under DOS/VS, OS/VS1 or OS/VS2; or under RSCS and
VM/370, or any of these operating systems running under
VM/370. Note: OS/VS2 is not supported by the 4300 Pro-
cessors. The 3777 mdl 1 Communication Terminals use
2770/3780 BSC programming support when operating in BSC
mode. Operation with S/360, S/370 or 4300 Processors using
2770/3780 BSC programming is also permitted. See SRL
GA27-3097 for BSC compatibility considerations. The customer
may have to modify existing 2770/3780 application programs for
operation with 3777 mdl 1. BSC attachment can be made via a
3704/3705 Communications Controller, or a 2771 Data Adapter
Unit attached to a channel of any S/370 Processor; or via an
Integrated Communications Adapter on S/370 mdl 115, 125,
125, 135, 135-3 or 135; or via a Communications Adapter feature
on the 4331 Processor. BSC attachment can be made via a
3704/3705 attached to a channel of a S/360 mdl 30, 40, 50,
65, 67 (in 65 mode), 75 or 195; via a 2701 attached to a chan-
nel of a S/360 mdl 22, 25, 30, 40, 44, 50, 65, 67 (in 65 mode),
75 or 195; or via an Integrated Communications Attachment on
S/360 mdl 75.

Bibliography: GC20-0001.
Specify: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz) \#9860
for locking plug, or \#9861 for non-lock plug. See 3203 mdl 3 for
3-phase power requirements


[3] Cabling: Fixed length cables are supplied as standard. Refer
for Installation-- Physical Planning, GA27-3006 and to

[4] International Print Support: \#9351 ... provides support for
modified AN, PN and SN print train arrangements for the 1416
Interchangeable Train Cartridge corresponding to the 48, 64
and 94-character EBCDIC sets available for print belts for the 3776
Communication Terminal. Support is also provided for the QN,
HN, AN, PN, RN and FCS-HN arrangements. See "Type Catalog." Note:
Not recommended for field installation ... replaces the stan-
dard print support.

[5] EIA RS232C 19.2 Kbps Line Speed: \#9481 ... provides sup-
port of 19.2 Kbps. Provides diagnostics and used for record
purposes.

MODEL UPGRADE PURCHASE PRICES (there are no additional
installation charges)

Model 1 to Model 2 ... $4,600*  
Model 1 to Model 3 ... $11,240* 
Model 2 to Model 3 ... $6,440*  

*Customer price quotations and customer order ac-
knowledgement letters for purchase of upgrade must state:
"Installation of this model change involves removal of parts
which become the property of IBM...."

†Model Upgrade Price assumes Special Features
\#1601 and \#1602 are installed on the Model 2. If
they are not, an RPO must be submitted.

SPECIAL FEATURES
[All special features can be field installed, except \#1201 for
which field installation is not recommended.]

For Communication Capability -- select one Communication
Feature (#1460, 1461 or 1470); a Communication Driver
(#1481), and EIA Interface (#3701), or High Speed Digital Inter-
face (#4501). \#1462 is required in addition to \#1460 or \#1461
for multipoint operation using BSC.

COMMUNICATION FEATURE ... select one.

SDLC/BSC, SWITCH CONTROL (#1460). Provides communica-
tion procedure using SDLC or BSC under operator switch con-
trol. SDLC allows point-to-point or multipoint operation. BSC
operation is point-to-point without \#1462, multipoint with
\#1462. Maximum: One. Limitation: Cannot be installed with
\#1461 or \#1470. See SRL GA27-3097 for BSC compatibility
considerations.

BSC.POINT-TO-POINT (#1461). Provides for point-to-point BSC
operation over switched or non-switched facilities. Maximum:
One. Limitation: Cannot be installed with \#1460 or \#1470.
See SRL GA27-3097 for BSC compatibility considerations.

SDLC (#1470). Provides for switched and non-switched SDLC
procedures. For record purposes, also identify the primary
CPU/Program Environment code. Specify one of the following:
\#977 for DOS/VS VTAM, \#9885 for OS/VS1 VTAM, \#9889
for OS/VS2 VTAM, or \#9993 for all other combinations of oper-
ating systems and access methods. Maximum: One. Limitation:
Cannot be installed with \#1460 or \#1461.

BSC MULTIPUNT (#1462). Required for BSC multipoint operation
on non-switched facilities. Maximum: One. Prerequisite:
\#1460 or \#1461. Limitation: See SRL GA27-3097 for BSC
compatibility considerations.

COMMUNICATION DRIVER WITHOUT BUSINESS MACHINE
CLOCKS (#1481). Provides communication driver without clock-
ing. Maximum: One. Prerequisite: Communication Feature
(#1460, 1461 or 1470).

EIA INTERFACE (#3701). Provides an EIA RS-232C compatible
interface and a cable for attachment to a modem. Speeds from
2400 bps to 9600 bps and at 19.2K bps are permitted.
Maximum: One. Prerequisite: Communication Driver (#1481).
For 19.2 Kbps operation, \#9481 is required ... see item \#5 under
"Specify." Limitation: Cannot be installed with High Speed Digital
Interface (#4501) or V35 Interface (#4720).

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94
ASCII graphics) is provided in place of the standard EBCDIC
topical keyboard. This feature also provides for operation with
diskette storage features (ASCII is written on the diskette) and with
BSC features \#1460, 1461 or 1462 or with SDLC features \#1460 or
\#1470. A 1416 Interchangeable Train Cartridge containing an
ASCII GN print train is required for the 3203 Printer mdl 3 if
\#1201 is ordered for the 3777. Maximum: One. Field
Installation: Not recommended.

AUDIBLE ALARM (#1390). Sounds an alarm that alerts the oper-
ator of conditions requiring manual intervention. The alarm can
be enabled and reset from the keyboard. Maximum: One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for
the desk-console cabinet door. Maximum: One. Limitation: The
keys provided for this lock can be duplicated by local keymakers.
Additional or replacement keys are not available from
IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four
identical keys for both desk-console cabinet doors. Maximum:
One. Prerequisite: Diskette Storage, 2nd (\#4902). Limitation:
The keys provided with this lock can be duplicated by local key-
makers. Additional or replacement keys are not available from
IBM.

HIGH SPEED DIGITAL INTERFACE (#4501). Provides an inter-
face and a cable for attachment to a modem which permits point-
to-point synchronous operation at 19.2K bps on a Type 5703 or
8803 wideband channel. Maximum: One. Prerequisite: Commu-
nication Driver (#1481). Limitation: Cannot be installed with EIA

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3777 Communication Terminal Model 1 (cont'd)

Interface (#3701) or V35 Interface (#4720).

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. Maximum: One.

V35 INTERFACE (#4720). Required for direct High Speed Local attachment to a 3705-Il at 14.4K bps with a maximum cable distance of 170 feet. Limitation: Cannot be installed with #3701 or #4501. Field Installation: Yes. Prerequisite: Communication Drk (#1481).

DISKETTE STORAGE, 1ST (#4901). One device with a customer removable diskette is placed in the left cabinet. Additional diskettes are available from IBM. Characteristics of the diskette storage device are: one movable read/write head; one read/write surface; 73 tracks; 26 sectors per track and 128 bytes per sector. Up to 949 256-bytes records, or 474 512-byte records can be stored on the diskette (one 256-byte record is reserved for forms control information). Each 256-byte record is stored in two consecutive numbered sectors in exchange mode, or in two non-consecutive sectors in 3770 mode. Each 512-byte record is stored in four consecutive sectors in exchange mode, or four non-consecutive sectors in 3770 mode. Diskette data is code insensitive in SDLC mode, non-transparent only in BSC mode. Maximum: One.

DISKETTE STORAGE, 2ND (#4902). Provides a second diskette storage device with the same characteristics as the first. It is placed in the right desk cabinet which is also supplied by this feature. The second diskette allows additional capabilities for: Copy -- data can be copied from diskette 1 to diskette 2 (single data set or all active data sets ... 3770 mode only). Concatenate (pool) -- the ability to concatenate on a data set basis. Continue -- allows a read or write program to automatically continue to diskette 2 if it has been placed in ready condition. Maximum: One. Prerequisite: Diskette Storage, 1st (#4901).

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8", ranging from 0.007" to 0.045" thick may be read. With BSC, a read operation can be initiated during a keyboard to line job only. Data read from the magnetic stripe card cannot be printed. Maximum: One. Limitations: [1] The operator must position and slide the card through the reader/spot at a steady rate between 5 and 40 inches per second for a read operation ... [2] BSC programming for 2770 and 3780 does not support this feature.


2502 CARD READER ATTACHMENT (#48002). Provides for attachment of a 2502 Card Reader md1 A1, A2 or A3. Maximum: One

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>ETP/MAC</th>
<th>MLC</th>
<th>MRC 2Y</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDLC/BSC,Switch Ctrl</td>
<td>#1460</td>
<td>$32</td>
<td>$27</td>
<td>$1,080</td>
<td>$6.00</td>
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<tr>
<td>BSC, Pt-to-Pt</td>
<td>1461</td>
<td>19</td>
<td>16</td>
<td>640</td>
<td>3.00</td>
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<tr>
<td>SDLC</td>
<td>1470</td>
<td>16</td>
<td>14</td>
<td>550</td>
<td>3.00</td>
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<tr>
<td>BSC Multipoint</td>
<td>1462</td>
<td>13</td>
<td>11</td>
<td>440</td>
<td>1.00</td>
</tr>
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Communication Driver

<table>
<thead>
<tr>
<th>Card Machine Ctrl</th>
<th>1481</th>
<th>13</th>
<th>11</th>
<th>440</th>
<th>2.00</th>
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<tbody>
<tr>
<td>EIA Interface</td>
<td>3701</td>
<td>13</td>
<td>11</td>
<td>440</td>
<td>1.00</td>
</tr>
<tr>
<td>ASCII Feature</td>
<td>1201</td>
<td>18</td>
<td>15</td>
<td>600</td>
<td>.50</td>
</tr>
<tr>
<td>Audible Alarm</td>
<td>1390</td>
<td>40</td>
<td>40</td>
<td>50</td>
<td>.50</td>
</tr>
<tr>
<td>Door Keylock</td>
<td>3401</td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>.00</td>
</tr>
<tr>
<td>Door Keylock, Dual</td>
<td>3402</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>.00</td>
</tr>
<tr>
<td>High Spd Digital</td>
<td>4501</td>
<td>41</td>
<td>35</td>
<td>1,400</td>
<td>1.00</td>
</tr>
<tr>
<td>Keylock</td>
<td>4650</td>
<td>35</td>
<td>35</td>
<td>15</td>
<td>.00</td>
</tr>
<tr>
<td>V35 Interface</td>
<td>4720</td>
<td>15</td>
<td>15</td>
<td>510</td>
<td>2.00</td>
</tr>
<tr>
<td>Diskette Storage, 1st</td>
<td>4901</td>
<td>69</td>
<td>69</td>
<td>2,360</td>
<td>15.00</td>
</tr>
<tr>
<td>Diskette Storage, 2nd</td>
<td>4902</td>
<td>69</td>
<td>59</td>
<td>2,360</td>
<td>6.50</td>
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<tr>
<td>Operator ID Reader</td>
<td>5450</td>
<td>13</td>
<td>11</td>
<td>440</td>
<td>1.50</td>
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<tr>
<td>Diskette Storage, Enhancement</td>
<td>5595</td>
<td>18</td>
<td>15</td>
<td>600</td>
<td>.00</td>
</tr>
<tr>
<td>2502 Cd Rdr Attachment</td>
<td>8002</td>
<td>29</td>
<td>25</td>
<td>1,000</td>
<td>4.50</td>
</tr>
</tbody>
</table>

Console Display -- contains up to 1,024 characters of information formatted into 16 lines of 64 character positions each. Operator messages are displayed in the top 14 lines of the display. Operator originated keyboard data is displayed in the bottom 2 lines of the display and will be displayed as keyed.

Operator messages larger than 64 characters overflow to subsequent lines. Subsequent lines of the message are indented. The latest message displayed is identified with a special character. If the display becomes full, the oldest message is overlaid, retaining the most recent messages on the display. The operator may defer subsequent messages in order to complete reference to a particular message.

Console Display Spooling -- a diskette storage device may be attached to the 3777 md1 2 by special feature to provide storage for operator console messages. Two options are available to the operator when the diskette becomes full. First, automatic rewrite occurs. New messages are stored, overwriting messages commencing with the initial message written upon the diskette. Second, an end of diskette signal is provided to the operator and messages are suspended pending replacement of the used diskette by a new diskette.

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Model see the 3777 Communication Terminal - ---- ------ displayed for reference.

the printer. may be paged backward a defined number of messages and image Basic Exchange datasets. Basic Exchange datasets may be attached.

datasets may be printed. Initial Program Load of the workstation program may take place from the Diskette Input Device if the Console Spool Device is not present. Diskette IPL must take place from the Console Spool Device if both diskette devices are present. IPL is available from the 2502 Card Reader if that device is attached.

If the 3777 mdl 2 configuration includes both a 2502 Card Reader and the Diskette Input Device, diskette output may be alternated with cards; however both devices will not operate simultaneously. If the 3777 mdl 2 configuration includes a Diskette Input Device instead of a 2502 Card Reader, and IPL is executed from the Diskette Input Device or the Console Spool Device, the IPL diskette containing the workstation program must have been written on a 3777 mdl 2 configuration containing a 2502 Card Reader and a diskette device.

Buffers -- transfer data between the input and output devices and the communication line. The buffers alternate in providing input and output services to permit overlapped operation. Storage is provided in the 3777 mdl 2 configuration for each input and output device attached. The buffer size is variable, depending upon the workstation program. The recommended buffer size is 512 bytes.

Communications Adapter -- integrated to provide BSC point-to-point operation over switched or non-switched facilities.

Printer Format Controls -- facilitate the formatting of printed data. Vertical forms definition provides forms set-up for the printer by means of the keyboard or card reader. The definition may be displayed on the console display, if present, or printed for verification.

Extended forms definition may be used in conjunction with the Diskette Input Device (#3201). Standard forms definition provides for the definition of five printer forms. Extended forms definition provides for greater than five printer forms. The Diskette Input Device (#3201) is a prerequisite to the use of extended forms definition.

Compression/Expansion -- provides a means for improving the efficiency of data transmission. Provides options (of dependent upon the workstation program) traling blank truncation, blank or data compression/expansion.

Performance Considerations -- the line-to-printer performance of the 3777 mdl 2 and attached 3203 Printer mdl 3 is up to 1,000 lpm (up to 1,200 lpm with 3203 mdl 3 Speed Enhancement feature) with 48 character AN or HN set, and up to 870 lpm (up to 1,020 lpm with 3203 mdl 3 Speed Enhancement feature) with a 60 character PN set. The 3777 mdl 2 may operate, however, with concurrent input processing as a function of the MULTI-LEAVING capability. The card reader, punch and display console may have a degrading effect on printer performance while transferring data to and from the 3777 mdl 2 buffers and the host as communications line time is shared by all 3777 mdl 2 I/O units.

Actual terminal device throughput is dependent upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application programs, etc., must all be considered in determining actual throughput. See 2770 Data Communication System, GA27-3097, for additional information.

Problem Determination Procedures -- significant function has been designed into this unit to help provide greater availability to the customer. This has been done through the use of problem identification routines and procedures that are easily understood and used by the operator. See IBM 3777-2 Operating Procedures Guide, GA27-3229.

Customer Responsibilities -- it will be a customer's responsibility to use and follow the Problem Determination Procedures and fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages for information on customer responsibilities, communication facilities, and other attachment information.

For 19.2 Kbps, the 3777 mdl 2 may use either the EIA or the High Speed Digital Interface to communicate through an appropriate modem and communication facility with a 3704/3705 Communications Controller equipped with Line Set Type 1G (#4717) at the central processing unit. This type of communication requires modems which are input- or output-port selectable (suitable for interconnection) and which provide optional EIA RS232C or High Speed Digital Interface DTE interfaces. Also attaches via a Communications Adapter feature on the 4331 Processor ... see M 4331 pages for details.

IBM Modems: The following IBM modems can be used: 3863 (2400 bps), 3864 (4800 bps) or 3865 (9600 bps). Note: 4-wire Switched Network Backup is available on the 3863 mdl 1, 3864 mdl 1 and 3865 mdls 1 or 2. For communications capability, product utilization and features, see 3863, 3864, 3865 and M 2700 pages.

Supplies -- for 3203 Printer mdl 3 ribbons

Limitations -- the input/output capabilities outlined under "Highlights" are dependent on appropriate configurations of the terminal. The keyboard is standard on the 3777 mdl 2, while the 3203 Printer mdl 3 is a stand-alone unit. A minimum configuration includes a 3777 Communication Terminal mdl 2, a 2303 Printer mdl 3 and a 2502 Card Reader or a Diskette Input Device (#3201). If a Diskette Input Device is attached and a 2502 Card Reader is not present, a Console Display (#1601) is required.

Prerequisites: For BSC communications with S/360, S/370 or 4300 Processor -- the 3777 mdl 2 will interface to current host MULTI-LEAVING programming systems as a S/360 mdl 20 - Submodel 5. BSC attachment can be made via a 3704/3705 Communications Controller, a 2701 Data Adapter Unit, or the 3777 Communications Adapter Control attached to a channel of any S/360, S/370 or 4300 Processor supporting BSC MULTI-LEAVING Workstations. Also attaches via a Communications Adapter feature on the 4331 Processor.

Bibliography: GC20-0370 or #9881 for non-lock plug, See 3203 mdl 3 for 3-phase power requirements.


[4] International Print Support: #9351 ... provides support for modified AN, PN and SN Print Train Arrangements for the 1416 Interchangeable Train Cartridge corresponding to the 48, 64 and 94 character EBCDIC sets available for print belts for the 3777 Communication Terminal. Support is also provided for the QN, HN, AN, PN, RN and PCS-HN arrangements. See "Type Catalog," Note: Not recommended for field installation ... replaces the standard print support plan.

[5] EIA RS232C 19.2K BPS Line Speed: #9461 ... provides support of 19.2K bps. Provides diagnostics and is used for record purposes.

PRICES: Mdl MRC 2 Yr Purchase MMMC

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MRC</th>
<th>2 Yr Purchase</th>
<th>MMMC</th>
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<tbody>
<tr>
<td>3777</td>
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<td>$422</td>
<td>$359</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$14,360</td>
<td>$79</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B Machine Group: D Per Call: 1 Purchase Option: 50% Useful Life Category: 2 Warranty: B Termination Chg Mths: 5 Termination Chg Percent: 25% Upper Limit Percent: 0%

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 2 to Model 3 ... $6,440*

* Customer price quotations and customer order acknowledgement letters for purchase must state: Installation of this model change involves removal of parts which become the property of IBM." ... This Model Upgrade Price assumes Special Features #1601 and #1602 are installed on the Model 2. If they are not, an RPQ must be submitted.

SPECIAL FEATURES

[A special features can be field installed.]

AUDIBLE ALARM (#1390). Sounds an alarm that alerts the operator of conditions requiring maintenance intervention. The alarm can be enabled and reset from the keyboard. Maximum: One.
CONSOLE DISPLAY

CONSOLE DISPLAY SPOOLING

CLOCKING


CONSOLE DISPLAY (#1601). Provides a 1024 character (16 lines of 65 characters each) console information display. Maximum: One.

CONSOLE DISPLAY SPOOLING (#1602). Diskette storage device for spooling of console display messages. One device with a customer removable diskette placed in the left cabinet. Additional diskettes are available from IBM Maximum: One. Prerequisite: Console Display (#1601).

DISKETTE INPUT DEVICE (#3201). Diskette storage device for reading of card image Basic Exchange datasets. One device with a customer removable diskette placed in the right cabinet. Additional diskettes are available from IBM Maximum: One.

DOOR KEYLOCK (#3401), Provides one keylock and two keys for the desk console cabinet door. Maximum: One. Limitation: The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. Maximum: One. Prerequisite: Diskette Input Device (#3201). Limitation: The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.


HIGH SPEED DIGITAL INTERFACE (#4501). Provides an interface and a cable for attachment to a modem which permits point-to-point synchronous operation at 19.2 Kbps on a Type 5703 or 8803 wideband channel. Maximum: One. Prerequisite: Communication Driver (#1481). Limitation: Cannot be installed with EIA Interface (#3701) or V35 Interface (#4720).

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to input, output, or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. Maximum: One.

V35 INTERFACE (#4720). Required for direct High Speed Local Attachment to a 3705-II at 14.4K bps with a maximum cable distance of up to 170 feet. Limitation: Cannot be installed with #3701 or #4501. Field Installation: Yes. Prerequisite: Communication Driver (#1481).

OPERATOR ID READER (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read. See IRD Sales Manual for magnetically stripped and encoded identification cards. A read operation can be initiated during an operator inquiry (SYS REQ function). Data read from the magnetic stripe card cannot be printed, displayed or written on the Console Display Spooling diskette. Maximum: One. Prerequisite: Console Display (#1601). Limitations: [1] The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation ... [2] BSC programming does not support this feature.

PRINT SPEED ENHANCEMENT (#5595). Provides support for a 3203 Printer mdl 3 operating with Speed Enhancement (#6360) at 1200 lpm. Maximum: One.


3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3251 can be equipped with special features for Card Read/Punch Check and/or Card Print. Maximum: One. Limitation: The Card Read/Punch Check special feature on the 3521 is limited to the punch checking function only.
Purpose: The 3777 mdl 3 is a high speed remote job entry terminal and is a member of the 3770 Data Communication System. The 3777 model 3 supports SNA Multiple Logical Unit (MLU) terminal controller and a console display are used for terminal control and for operator communication with the host CPU. Terminal operation may be controlled by the storage of operating procedures, terminal setups and local utility programs in terminal storage for use by the terminal operator. The 3777 is not designed as an interactive terminal.

Maximum Lines Per Minute

<table>
<thead>
<tr>
<th>Std 3203 mdl 3</th>
<th>Featured 3203 mdl 3 Character Set</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>1200</td>
</tr>
<tr>
<td>1125</td>
<td>1250</td>
</tr>
<tr>
<td>760</td>
<td>900</td>
</tr>
<tr>
<td>870</td>
<td>1020</td>
</tr>
<tr>
<td>960</td>
<td>1080</td>
</tr>
</tbody>
</table>

Highlights:
- Communications — transmission speeds from 2400 bps to 9600 bps and at 19.2K bps are provided using the appropriate mode to a maximum speed of 300,000 bps. May also be locally attached to either a duplex or half-duplex mode at a 3705 at 14.4K bps.
- Keyboard — EBCDIC arrangement with 44 data keys. The keyboard is fully compatible with a standard console display, indicating lights, function keys, operating mode switches and a 3-position numeric display provides operator control. Host application comes with host control features and seamless integration.
- Console Display — contains 16 lines of 64 characters each for a total of 1024 characters. The 3777 mdl 3 reserves the bottom three lines of the display for operator keying, display of system information and prompting for information required for the execution of functions. The remaining 13 lines of the display are used to display messages between the terminal and the host application.
- Lower case alphabets are converted to upper case before display.
- Each message is displayed as it is received, except as described below.
- Each message is also written in terminal storage. When power on time the operator is prompted to specify date and time.
- Each message is received and displayed prior to the terminal's ability to read data from the host.
- Function keys on the keyboard allow the operator to control the display function. The display can be held while incoming messages are sent to terminal storage and not displayed. If messages arrive during the "hold" state a message light notifies the operator. The operator may subsequently display the desired message group. A terminal utility program is available for listing or copying the message contents of terminal storage for external message retention and reference.
- Printer — a stand alone 3203 Printer mdl 3 cable attached to the 3777 mdl 3. The 3203 mdl 3 uses the 141 Intelligent Train Cartridge. The 3777 mdl 3 supports fifteen Print Train Arrangements (AN, RN, ON, OA, OD, AN, PN, ONC, RN, CN, SN, 9N, 9N, 9P, 9N, 9N, 9N, 9N, 9N) as standard. When a substitute character is ordered to replace a character in one of the standard arrangements, the substitute character assumes the type character and bits and codes of the character it replaces.
3777 Communication Unit Model 3

---

Input
Card
Magnetic Tape
Diskette

Output
Printer, Magnetic Tape, Diskette, Card Punch
Printer, Diskette, Card Punch

---

Record Formats -- consist of card image, print image and 3770 format. Card image and print image, in addition to being applicable to card reader, card punch, printer and magnetic tape data sets, are also applicable to diskette as a function of Basic Exchange datasets (128 byte maximum).

Basic Exchange diskettes may be read by the terminal. Basic Exchange diskettes may also be written by the terminal, thereby creating a diskette for further Basic Exchange mode processing. The 3770 format is applicable to diskette data recording which is to be subsequently printed or punched. 3770 format recording results in more efficient diskette utilization than does card or print image. Basic Exchange (card or print image) or 3770 format is a user specification in job control.

Input record size from both magnetic tape and diskette may be limited to 80 or 128 bytes, because of host programming considerations. A record size that can accommodate multiple data sets, with different record lengths, into a single input job stream requires host programming support of a CDS-FM Header type 1 (Continuous Distance Selection). Remote Power Off -- this feature can be used to conserve energy used by the terminal by providing the capability for the host CPU application program to initiate power down at the terminal by a controlled data stream over communication facilities. The terminal must also be equipped with the appropriate communication special features. This capability is in addition to the standard power down switch which can be manually operated.

Encrypt/Decrypt Feature -- available to provide secure data transmission in conjunction with ACF-VAEN Encrypt/Decrypt Feature (Program Number 5735-RC2) (Feature Number 6010) and Programmed Cryptographic Facility Program Product (Program Number 5740-KY5).

Performance Considerations -- the line-to-line printer performance of the 3777 md3 and attached 3203 md3 is up to 1000 lpm (up to 1200 lpm with Speed Enhancement (#3680) on the 3203 md3 and 3 Print Speed Enhancement (#5595) on the 3777 md3 itself with 46 character AN or HN set, and up to 870 lpm (up to 1080 lpm with #3680 on the 3203 and #5685 on the 3777) with a 60 character PN set. The 3777 md3 MLU terminal will operate, however, with concurrent input-output processing in either a duplex or half-duplex data communications mode as a function of the base Multiple Logical Unit capability. The card reader, punch, diskette storage devices, magnetic tape unit and display console may have a degrading effect on printer performance during concurrent operations.

The degree of degradation which may occur will tend to be greater when half-duplex communications are employed as opposed to duplex communications and system facilities in support of the concurrent inbound-outbound data stream capability of the terminal.

Actual terminal device throughput depends upon operational and systems programming characteristics. Factors such as the communication facilities, transmission block lengths, compression characteristics, characters read/printed, forms skipping, application processing, SNA pacing, cryptographic processing, etc., must all be considered in determining actual throughput.

In general, duplex data communications operation will tend to provide greater terminal throughput under concurrent input/output functions than a half-duplex communications mode. The 3777 md3 operating duplex at 19.2 Kbps on a terrestrial link may, however, present a variance of from greater to degraded overall terminal throughput when compared to comparable operation in a half-duplex mode.

Problem Determination Procedures -- Function has been designed into this unit to help provide availability to the customer. See IBM 3770 Multiple Logic Unit Operator's Guide for 3776-3, 3776-4, 3777-3.

Customer Responsibilities: It will be a customer's responsibility to use the provided Problem Determination Procedures to fill out the trouble report prior to calling IBM for service. Also refer to M 2700 pages.

Communications: See 'Special Features.' Transmission speeds from 4800 to 9600 bps and at 19.2 Kbps, Print-out and multipoint transmission capability over switched or non-switched facilities allowed by selecting the appropriate modem and communication facility. Speeds above 4800 bps are on non-switched facilities. Direct local attachment to a 3705-II at 14.4 Kbps. EBCDIC is the standard transmission code. ASCII is available as a special feature. Refer to M 3705 unit for information on customer responsibilities, communication facilities, and other attachment information.

For 19.2 Kbps, the 3777 md3 may use either the EIA Interface or the High Speed Digital Interface to communicate through an appropriate modem and communication facility with a 3704/3705 Communications Controller equipped with Line Set Type 1G (#7417) at the central processing unit. This type of communication requires modems which are line compatible (suitable for interconnection) and which provide optional EIA RS232C or High Speed Digital Interface DTE/DCE interfaces. Also attaches via a Communications Adapter special feature on a 4331 Processor. The 4331 must be equipped with a Local Attachment Interface (#48001) and its prerequisites... see "Special Features" under 4331.

IBM Modems: The following IBM modems can be used: 3863 (2400 bps), 3864 (4000 bps) and 3865 (9600 bps). Note: 4-wire Switched Network Backup is available on the 3863 md1 1, 3864 md1 or 3865 md1 or 2. For communications capability, product utilization and features, see 3863, 3864, 3865 and M 2700 pages.

Supplies: 3203 md3 ribbons.

Limitations: The input/output capabilities outlined under "Highlights" depend on appropriate configurations of the terminal. Keyboard, console display, and terminal storage are standard. The 3203 Printer md3 3 is a standalone unit. A minimum configuration includes a 3777 md3 3 and a 3203 md3 3. One communications feature (#3701, 4501, 5650 or 5651) is required. For other configurations, refer to "Special Features" below.

The duplex data communications capability of the 3777 md3 is operational on non-switched full duplex communications facilities only.

Communications Adapter: An integrated communications adapter without business machine clocking is standard provides SDLC communications over switched or non-switched facilities.

Prerequisites for SDLC Communications with S/370 or a 4300 Processor: A 3704 or 3705 Communications Controller operating under Network Control Program (NCP/VS) and attached to any virtual storage S/370 Processor or 4300 Processor operating under VS1, MVS or DOS/VS using RES, JES2, JES3, POWER/VS and VTAM. Note: MVS and JES3 are not supported by the 4300 Processors.

An appropriately featured 3705 operating under the appropriate level of Network Control Program (ACF/NCP/VS) is required for duplex data stream operation.

Bibliography: GC20-0001

**SPECIFY**

- **Voltage** (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9981 for non-lock plug. See 3411 md1 1 for magnetic tape unit voltage requirements... see 3203 md3 3 for 3-phase power requirements.
- **Color**: Blue is supplied as standard.
- **Cables**: Fixed length cables are provided as standard, except for the 3411. See Installation Manual - Physical Planning, GA27-3006. 3411 cables must be ordered separately.
- **EIA RS232C 19.2 Kbps Line Speed**: #9481 ... provides support of 19.2 Kbps for use for record purposes.
- **Alternate Address**: #9011 ... for record purposes only. Order this optional feature to specify that diskettes containing terminal code updates are to be mailed to an alternate address specified by a Teleprocessing Control number (TPC). The alternate address selected is usually the central site location.

**PRICES:**

- **Mdl**: 3...
- **MRC**: $611
- **2 Yr**: $520
- **MMNC**: $2,080
- **Purchase**: $163

**Plan Offering**: Plan B
- **Machine Group**: D
- **Per Call**: 1
- **Purchase Option**: 50%
- **Useful Life Category**: Warranty: B
- **Termination Charge Months**: 5
- **Termination Charge Percent**: 25%
- **Upper Limit Percent**: 0%

**MODEL UPGRADE PURCHASE PRICES** (There are no additional installation charges)

- **Model 1 to Model 3**: $11,240
- **Model 2 to Model 3**: $6,440

* Model Upgrade Price assumes Special Features #1601 and #1602 are installed on the Model 2. If they are not, an RPQ must be submitted.
3777 Communication Unit Model 3 (cont'd)

*** SPECIAL FEATURES

[All special features can be field installed, except #1201 for which field installation is not recommended.]

ASCII FEATURE (#1201). A 48 data key keyboard (produces 94 ASCII graphical) is provided in place of the standard EBCDIC keyboard. This feature also provides for operation with diskette storage features (ASCII is written on the diskette). Orders for #1201 must specify one print belt, #9494 for 64 character ASCII, #9494 for 64 character ASCII, or #9495 for 94 character ASCII. Maximum: One. Field Installation: Not recommended.

AUDIBLE ALARM (#1390). Sounds an alarm that alerts the operator or custodian of conditions requiring manual intervention. The alarm can be enabled and reset from the keyboard. Maximum: One.

DOOR KEYLOCK (#3401). Provides one keylock and two keys for the desk-console cabinet door. Maximum: One. Limitation: The keys provided for this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

DOOR KEYLOCK, DUAL (#3402). Provides two keylocks and four identical keys for both desk-console cabinet doors. Maximum: One. Prerequisite: Diskette Storage, 2nd (#4902). Limitation: The keys provided with this lock can be duplicated by local keymakers. Additional or replacement keys are not available from IBM.

ENCRYPT/DECRYPT (#3680). Provides cryptographic data transmission in conjunction with program support in the host. Includes a security keylock. Each machine will have its own unique key. Two identical keys are supplied with the feature. Maximum: One. Note: A part of this feature, IBM Part No. 1743456, or equivalent, is required. A battery is shipped with this feature. See M 10000 pages for additional or replacement batteries. Replacement of the discharged battery is the customer’s responsibility.

EIA INTERFACE (#3701). Provides an EIA RS232C compatible interface and a cable for attachment to a modem. Speeds from 2400 bps to 9600 bps and at 19.2 Kbps are permitted. Maximum: One. Limitation: Cannot be installed with High Speed Digital Interface (#4501), DDS Adapter, Point-to-Point (#5670), DDS Adapter, Multipoint (#5651) or V35 Interface (#4720). Print Speed: 19.2 Kbps operation, #9451 is required. See item 5 under ‘Specify.’

HIGH SPEED DIGITAL INTERFACE (#4501). Provides an interface and a cable for attachment to a modem which permits point-to-point and multipoint synchronous operation at 19.2 Kbps on a Type 5704 channel. Maximum: One. Limitation: Cannot be installed with EIA Interface (#3701), DDS Adapter, Point-to-Point (#5650), DDS Adapter, Multipoint (#5651) or V35 Interface (#4720).

KEYLOCK (#4650). Provides a mechanical keylock to activate controls that disable all operator activity related to keyboard or control of data at the terminal. Each machine will have its own unique key. Two identical keys are supplied with the feature. Refer to M 10000 pages for information on additional or replacement keys. Maximum: One.

V35 INTERFACE (#4720). Required for direct High Speed Local Attachment to a 370/370-II at 14.4 Kbps with a maximum cable distance of 170 feet. Limitation: Cannot be installed with EIA Interface (#3701), High Speed Digital Interface (#4501) or DDS Adapter (#5650 or 5651). Field Installation: Yes.

DISKETTE STORAGE, 1ST (#4901). One device with a customer removable diskette is placed in the left cabinet. Additional diskettes are available from IBM. Characteristics of the diskette storage device are: one movable read/write head; one read/write surface, 73 data tracks; 26 sectors per track and 128 bytes per sector. Up to 1988 128-byte records. Data may be in either a Basic Exchange dataset or in a 3770 format dataset. Diskette capabilities allow for:

- Concatenate (pool) ...
- the ability to concatenate on a dataset basis.
- Volume ...
- allows a read or write operation to automatically continue to diskette 2 if it has been placed in ready condition, or it may continue on the current drive.

Maximum: One.

DISKETTE STORAGE, 2ND (#4902). Provides a second diskette storage device with the same characteristics as the 1st. It is placed in the right desk cabinet which is also supplied by this feature. The second diskette allows additional capabilities for:

- Copy ...
- data can be copied from diskette 1 to diskette 2.

Maximum: One. Prerequisite: Diskette Storage, 1st (#4901).

OPERATOR ID FEATURE (#5450). Provides for reading magnetic stripe cards encoded in the ABA format to permit reading of 40 characters of which 37 are discretionary. Each character contains four bits plus odd parity. Card size 3-3/8" x 2-1/8" ranging from 0.007" to 0.045" thick may be read. Data read from the magnetic stripe card cannot be printed or displayed. Maximum: Limitation: The operator must position and slide the card through the reader-slot at a steady rate between 5 and 40 inches per second for a read operation.


DDS ADAPTER (DDSA) (#5650 - For Point-to-Point Operation ... #5651 - For Multipoint Operation). Provides an adapter for SDLc data transmission at speeds of 2400, 4800 or 9600 bps over the AT&T non-switched Dataphone. Digital Service Network. The DDSA interfaces to a DDS channel service unit, the customer site termination of the DDS network. Specify: #9822 for 2400 bps, #9823 for 4800 bps, or #9825 for 9600 bps. Maximum: One, #5650 or #5651. Limitation: Cannot be installed with EIA Interface (#3701), High Speed Digital Interface (#4501), or V35 Interface (#4720).

3411 MAGNETIC TAPE UNIT AND CONTROL M1 1 ATTACHMENT (#7801). To attach one 3411 Magnetic Tape Unit and Control mdl 1, Maximum: One. Prerequisite: Feature #7003 on the 3411 mdl 1.

2502 CARD READER ATTACHMENT (#8002). Provides for attachment of a 2502 Card Reader mdl A1, A2 or A3. Maximum: One. Limitation: Optical Mark Read on the 2502 is not supported.

3782/3521 CARD PUNCH ATTACHMENT (#8150). To attach a 3782 Card Attachment Unit mdl 1 and a 3521 Card Punch. The 3521 can be equipped with special features for Card Read/Punch Check and/or Card Print. Maximum: One. Limitation: The card read/punch check special feature on the 3521 is limited to the punch checking function only.

ACCESSORIES: The following item is available on a purchase only basis. For shipment with machine, order the part number indicated below at the price listed in the M 10000 pages, see M 10000 for additional information and field installation.

Mercury Battery (Part No. 1743456). Provides power to sustain the master key of the Encrypt/Decrypt feature (#3680) when normal power is not present. This accessory is a 4 volt non-rechargeable mercury battery. This battery has a shelf life of 1 year under normal conditions, and can be expected to provide 3.5 years of normal operation. Note: Discharged battery should be returned to IBM.

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IBM 3780 COMMUNICATIONS TERMINAL

Purpose: A data transmission terminal using the BSC technique. It can communicate over appropriate communications facilities to another 3780, a S/360 mdl 22 - 195, any S/370 or 4300 Processors, a 2701 Communication System, or a 2780 Data Transmission Terminal. May be locally attached to a 3704/3705 Communications Controller. For requirements, see "Prerequisites." NOTE: For possible use with S/360 mdl 20, System/3 and 1131, see GSD Manual.

Highlights: Provides medium speed, batch-oriented, buffered card reading and printing via appropriate communications facilities ... see "Communications Facilities." Punched card output provided via attachment of a 3781 Card Punch ... see 3781.

Card Reader — reads at a rated speed of 600 cards/minute. Provides hoper capacity of 1200 cards and stacker capacity of 1300 cards. Only 80 column cards can be read.

Printing — prints at a rated speed of 350 lines/minute utilizing the basic 52-character set. Interchangeable type bars of 39 and 63 character sets are provided as standard functions of the printer.

- define the end of a record, allowing for complete variable length.

Space Compression/Expansion — operable under switch control, this capability provides for the removal of consecutive spaces in transmitted data and their re-insertion in received data. A two character sequence is substituted for two or six-three consecutive spaces. If more than sixty-three consecutive spaces are to be transmitted, a second two character sequence will be substituted for the number of consecutive spaces greater than sixty-three. If only one space is to be transmitted, it will be transmitted as a normal space. This feature is inoperable when transmitting in transmitting-transmitting or transmitting-receiving mode.

Home Mode — provides card reader to buffer to printer operation in off-line non-communications mode.

Integrated 2400/1200 BPS Modem — provides 2400 bps transmission with half speed backup on leased and switched facilities ... compatible with IBM 3782 Modem.

Audible Alarm — allows a CPU to turn the communications line around after receiving text and return text without additional selection.

Communications Facilities: The 3780 operates in half duplex mode on C4, C5, C6, D3, D4, DS6B, D5, DS6B, DS8, X1M or X2M ... for information concerning these facilities, see M 2700 pages. The alphanumeric facility designations above correspond to those shown on the charts on those pages.

Binary Synchronous Transmission: Allows for transmission rates of 1200, 2400, 4800, 7200/3600 bps ... see ‘Modems’ below and Data Set Attachment under "Specify."' Communications can be with another 3780, 2772, 2775 mdl 1, 2 or 4, or a S/360 mdl 22 thru 195 (except mdl 44 or mdl 67 in TSS mode), or any S/370 or 4300 Processor ... for requirements, see "Prerequisites." In addition, the 3780 may be multi-dropped on the same line facility with other BSC devices (1826, 2715, 2772, 2780, 3271, 3272, 3735) as tributary stations on a multi-point line with a S/360 mdl 22-195 (except mdl 44 or mdl 67 in TSS mode), or any S/370 or 4300 Processor as the control station. In a switched control network, it may use the same termination (phone number) at the computer that is used for the other BSC devices.

Transmission Code: One of two codes can be selected ... see "Specify." For printable graphics, see "Type Catalog." EBCDIC Code — 256 character set which is the basic code of S/360; S/370 and 4300 systems. ASCII Code — Industry standard code with a 128 character set.

Transmission Checking: A redundancy check is performed on all data. EBCDIC uses a 16-bit cyclic check transmitted as two B-bit bytes. ASCII uses an odd parity CRC on each character, including the LRC character and an LRC check transmitted as a single B-bit odd parity byte. Format check plus one even block check is provided on both code sets.

Modems: One Integrated 2400/1200 bps Modem feature, IBM 3563 Modem (2400/1200 bps), IBM 3872 Modem (2400/1200 bps), IBM 3874 Modem (4800/2400 bps) IBM 3875 Modem (2400/1200 bps), IBM 3872 Modem (4800 bps) can be attached to the 3780. For communications capabilities, product utilization, and special features, see 364, 366, 3872, 3874, 3875, M 2700 pages, and Integrated Modem under “Special Features” below. Card Limitations: Generally, scored cards require careful handling and a favorable environment. Use of the following scores has been approved.

Internal Scores (before separation) — M-4, M-5, OM-2, OM-3, S-1 and ID-3 (2" x 3-1/4" or 2-3/16" x 3-3/4" sizes only): NOTE: When using OM-2 or OM-3, reading must be terminated prior to the scored column.

External Scores (after separation) — M-3, M-4, M-5, M-6, M-7, M-11, OM-2, CF-4 and CF-11. OM-3 may be used if the score is on the column 1 end: NOTE: Upper left corner cut required when the M-11 or CF-11 is used on the column 1 end.

All other scores may result in unsatisfactory performance.

Aqua cards and C-4 corner cut cards cannot be used.

Customer Responsibilities: See M 2700 pages. In addition, the customer must be advised that when non-IBM data sets and independently owned communications facilities are used, he is responsible for insuring that signal levels and impedances are compatible with the IBM communications interface. PREREQUISITES:

S/360 mdl 25 communications can be via the Integrated Communications Attachment (#4580) with appropriate binary synchronous features on the 2025, or via a 2701 Data Adapter Unit or 2703 Transmission Control ... see below.

S/360 mdl 22-195 (except mdl 44 or 67 in TSS mode), or any S/370 Processor — communications can be via a 2701 Data Adapter Unit or 2703 Transmission Control equipped with appropriate binary synchronous features ... see 2701, 2703. NOTES: [1] To utilize OLT support, the host processor requires a minimum of 32K bytes of storage ... [2] The 3780 communicates only in EBCDIC or ASCII codes ... [3] Only EBCDIC Transparency (#3601) is available on the 3780. Therefore, a 2701 or 2703 must be configured with 3780 restrictions and limitations for compatibility ... [4] All 3780s on a multi-point line must have the same code, EBCDIC or ASCII.

S/360 (except mdls 22, 25, 44, 67 in TSS mode or 85), or any S/370 Processor — communications can be via a 3704/3705 Communications Controller ... see 3704, 3705. NOTE: See the 3704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments.

S/370 mtl 115, 125, 135, 135-3, 138 — communications can be with the Integrated Communications Add1 (#4400) and appropriate binary synchronous features on the 3115, 3125, 3135, 3135-3, 3138 as well as via a 2701, 2703 or 3704/3705.

4300 Processors — communications via a 2701, 3704 or 3705 to all 4300 Processors, and via the Communications Adapter feature on the 4331. See 3701, 3704/3705, 4331 and 4341 for details and prerequisites.

3704/3705 Medium Speed Local Attachment — attachment without modem at speeds up to 2400 bps via IBM-provided cables. Requires Synchronous Clock ... see "Specify." 2770 Data Communication System — communications require Terminal Use (#9711) and the same Transmission Code (#9761 or #9762) on both units. The 2772 must have Buffer Expansion, Add1 (#1491), or both the 3780 and the 2772 must have EBCDIC Transparency.

Another communications require Terminal Use (#9711) and the same Transmission Code (#9761 or #9762) on both units ... see "Specify." 2780 Data Transmission Terminal (mdls 1, 2, 4 only) — communications require that both terminals have EBCDIC Code (#9761 or #9762 on 3780, #9803 on 2780 and EBCDIC Transparency (#9801, #9802) on 3780, #9803 on 2780). Communications can be in EBCDIC Transparency mode only and the 3780 may not have multiple records in Transparent mode.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.

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SPECIAL FEATURES

Communications Special Features -- use of the following special features depends upon the communications application(s) for which the specific 3780 is to be used.

COMPONENT SELECTION (#1601). Provides the capability of specifying 3780 1/0 device selection. In addition to component selection, it provides priority output selection and multi-point Data Link Control Component Selection capability. It is a prerequisite for attachment of a 3781 Card Punch. Field Installation: Yes.

EBDCIC TRANSPARENCY (#3601). Allows the 3780 to receive and transmit all 256 EBDCIC bit combinations as data. Variable length records cannot be transmitted if card I/O or printers is selected. Either normal or transparent text can be RECEIVED without the "transparency" switch being in the transparent position. The switch must be ON for TRANSMITting in transparency. If a terminal on a multi-point line requires this feature, field installation: Yes. Prerequisite: EBDCIC Transmission Code (#9761).

KEYLOCK (#4650): A key-operated Power-On switch for the 3780. The key must be inserted and turned to the "On" position before the control unit Power-On switch is operative. When the key is turned off, power is removed from the control unit. For additional or replacement keys, see M 10000 pages. Field Installation: Yes.

MULTI-POINT DATA LINK CONTROL (#5010). Allows multiple 3780s to be used on the same communications line with a CPU. Terminal can be polled or selected when operating as a tributary station on a multi-point system. All 3780s installed on the same line facility require this feature and must use the same transmission, speed and data set attachment. Other BSC devices, e.g., 2700, S/360, S/370 or 4300 Processors as tributary stations, can be on a multi-point line with a processor control station.

Limitation: If Terminal Use (#9711) is installed, it must be moved prior to installation of this feature. Field Installation: Yes.

INTEGRATED 2400/1200 BPS Modem (#5600, 5602, 5610). Provides an integrated 2400 bps modem with half speed backward capability. Equivalent to and compatible with similarly featured IBM 1126 Modes. Three versions cover different communications requirements, as described below. Operator controls are integrated with the 3780 operator panel. Built-in diagnostic functions are provided for local and remote testing. See M 3782 pages and "Prerequisites" above for additional information on allowable machine/system combinations and required features.

Maximum: One #5600, or #5610.

Leased Line Point-to-Point Modem (#5600) -- operates over D4 or (with Switched Network Backup, #7951) D4BS facilities with a similarly equipped 3780 or a 2770, 2780, 3780, S/360, S/370 or 4300 Processors equipped with appropriate features and an equivalent featured IBM 3872 Modem. Includes manual equalization control. Field Installation: Yes. Prerequisites: Submit an RPO for operation on a basic 3002 channel. Modem or Data Set Attachment #9121 with Switched Network Backup, #7951, Half Duplex (#9402) Communications Facilities Control. Terminal Use (#9711) may be required, depending upon application.*

Leased Line Multipoint Tributary Modem (#5602) -- operates on a multipoint network with a controlling CPU. Other 3780s on the same line facility must have either this feature or any other feature or any other model with Modem with Multipoint Tributary (#5101 or #5102); other BSC tributary devices on the same line facility must have an IBM 3872 Modem with #5101 or #5102. Utilizes D4 or (with Switched Network Backup, #7951), Half Duplex (#9402) Communications Facilities Control, Multipoint Data Link Control (#5010).*

Switched Network Modem (#5610) -- operates over the Switched Network facility C5 with a similarly equipped 3780 or a 2770, 2780, 3780, S/360, S/370 or 4300 Processors equipped with appropriate features and an equivalent featured IBM 3872 Modem with Switched Network Backup (#7941 or #7942). Provides automatic line equalization. Provides automatic answering/disconnect capability when used in conjunction with Switched Network Control (#7951). Field Installation: Yes. Prerequisites: Half Duplex operation (#9402), Modem Attachment (#9120).*

PRINT POSITIONS, ADDITIONAL (#5701). Provides an additional 24 print positions for the 3780 printer. Field Installation: Yes.

SWITCHED NETWORK CONTROL (#7651). To attach to a switched network, provides automatic answering of incoming calls initiated by another terminal or central computer or an M 2700, M carrier switched (dial-up) facilities. The line must be equipped with
3780 Communications Terminal (cont'd)
an appropriate data set with auto answer capability and the termi-
nal must be in a "ready" status. Provides automatic disconnect
when disconnect sequence is received or when no data is
transmitted/received for 20 seconds. Disconnect causes audible
alarm to sound. Specify: #9850 for use with the IBM 3874 Mod-
em. Field Installation: Yes.

SYNCHRONOUS CLOCK (#7705). A synchronous clock for use
with modems which do not have an internal clock, or for use with
3704/3705 Medium Speed Local Attachment Line Set, Type 1F.
Will operate at 1200 bps or 2400 bps. The device with which the
3780 will communicate must also have an internal clock operating
at the same bps rate. Specify: #9702 for 1200 bps, or #9704
for 2400 bps. Field Installation: Yes.

SWITCHED NETWORK BACKUP (#7951). Provides alternate
operation on facility D4SB for Leased Line Point-to-Point (#5600)
or Multipoint Tributary (#5602) feature. Auto answer is not pro-
vided. Half duplex mode of modem operation is forced when this
feature is selected by the operator panel "Mode" switch; a "Talk/Data"
switch is provided. This feature can be used with OS/DOS BTAM in certain configurations. Additional use program
routines will be required to fully utilize the capabilities of this
feature. For additional information see IBM Modem Marketing
Guide. Note: 4-wire Switched Network Backup is available on the
3863 mdl 1 and 3864 mdl 2. For product utilization and feature, see 3863
or 3864. Field Installation: Yes.

3781 CARD PUNCH

Purpose: Punched card output unit for a 3780 Data Communications
Terminal.

Highlights: Provides 80 column card output at a rated speed of
160 columns per second. Punches serially with actual throughput
dependent upon number of columns punched, communications
facility, and 3780 features employed. Refer to the 3780 Compo-
nent Information manual for throughput calculations.

A free standing unit, cable attached within seventeen feet of the
supporting 3780. It has a 1200-card capacity hopper and a 1300-
card capacity primeacker. Echo pulse check of punched data is
provided by the 3781 in addition to conventional transmission
checking provided by the 3780. Error cards are laced in card
column B2 and stacked in secondary stacker.

The unit may be used in home mode in conjunction with the
3780 card reader to create punched card output media.

Only one 3781 can be attached to a 3780 Data Communications
Terminal.

PREREQUISITES: A 3780 equipped with Component Selection
(#1601) ... see 3780.

Card Limitations: Heavy duty cards, aqua cards, and C-4 corner
cut cards cannot be used. Scored cards require careful handling
and a favorable environment. Recommended use of scored cards
is limited to the following:

Internal Scores (before separation) -- S-1, ID-1, ID-2, and for a
maximum of three passes, M-4 and M-5.

External Scores (after separation) -- M-7, M-11 (with round
corners), CF-11 (with round corners) on either end of the card,
and M-3 on column 80 end only.

Bibliography: See KWIC Index G320-1621 or specific system
bibliography.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug
-- #9884 for 208 V, or #9886 for 230 V. Non-lock plug --
#9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.
Must be consistent with that specified for the 3780.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue,
#9045 for gray, or #9046 for white.

[3] Transmission Code: #9761 for EBCDIC, or #9782 for ASCII.
Specify the same as that for the 3780. Can be field installed.

3781 1 $ 401 $ 341 $ 8,500 $ 69
Plan Offering: Plan B Purchase Option: 50% Machine Group: A
Warranty: B Useful Life Category: 1 Per Call: 2
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%
IBM 3782 CARD ATTACHMENT UNIT

Purpose: Used to attach the 2502 Card Reader mdl A1 or A2 to a 3774, 3775 or 3776 Communication Terminal mdl 1 or 2, or 3289 Printer mdl 3 (2502 mdl A1 only), or to attach a 3521 Card Punch to a 3771, 3774, 3775, 3776 or 3777 Communication Terminal mdl 2 or 3, or 3289 Printer mdl 3. Used to attach the 2502 Card Reader mdl A3 to a 3776 Communication Terminal mdl 3 or 4.

Model 1 Attaches a 3521 Card Punch.

Model 2 Attaches a 2502 Card Reader mdl A1, A2, or A3.

Model Changes: Not recommended for field installation.

Highlights: The unit supplies power and attachment circuits and serves as a stand for mounting the card machine.

PREREQUISITES:
Model 1 — requires 3782/3521 Card Punch Attachment (#8150) on the 3289 mdl 3, 3771, 3774, 3775 or 3776 mdl 1 or 2 and a 3521 Card Punch.

Model 2 — requires 3782/2502 Card Reader Attachment (#8149) on the 3289 mdl 3, 3774, 3775 or 3777 mdl 1 or 2 and a 2502 Card Reader mdl A1 or A2. Requires 3782/2502 Card Reader Attachment (#8149) on the 3776 mdl 3 or 4 and a 2502 Card Reader mdl A1, A2 or A3. The following specify features are required on the 2502: #9901 for 115 V AC, and #9046 for gray. NOTE: Available at time of manufacture only.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9850 for locking plug, or #9851 for non-lock plug.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.

PREREQUISITE:

PLAN OFFERING: Plan B
Special Feature Prices: MRC 2 yr Purchase MMC$ 25 $ 21 $ 840 $1.50

IBM 3784 LINE PRINTER

Purpose: A line printer for attachment to a 3774 Communication Terminal for use as a second printer or attachment to a 3651 Model 50 Retail Store Controller or 3651 Model 75 Programmable Store Controller.

Highlights: Maximum print speed of 155 lpm with 48 character set, 120 lpm with 64 character set, or 80 lpm with 94 character set. Line printing is from characters engraved on a revolving metal print belt.

Included as standard is one interchangeable print belt (48, 64 or 94 character set) ... see "Specify." A variable width forms tractor for feeding continuous forms up to 12" overall width, paper jam detection, compress/expand, printer forms control, dual buffers, and 132 print positions. Character spacing is 10 per inch, line spacing is 6 or 5 per inch.

Limitations: Refer to GA24-3488 for forms design considerations. Printed output is not supported for optical character reading.

PREREQUISITE: 3784 Attachment (#8155) on the 3774 Communication Terminal or 3784 Attachment (#8154) on the 3651 Model 50 Retail Store Controller or 3651 Model 75 Programmable Store Controller.

Supplies: A black ribbon, IBM Part No. 1136634 or equivalent. is required

Bibliography: GC20-0001

SPECIFY: [1] Voltage (115 V AC, 1-phase, 3-wire, 60 Hz): #9880 for locking plug, or #9881 for non-lock plug.
[2] Color: #9044 for red, #9045 for yellow, #9046 for blue, or #9047 for gray.
[3] Remote Power Off: #9501 ... specify this feature for capability to power down the 3774 and 3784 from the host CPU using a controlled data sequence sent over communications facilities. The 3774 must also be equipped with #9501, Not available with 3651 mdl A50, B50, A75 or B75 Attachment (#9716) or the 3651 mdl C75 or D75 Attachment (#9717).
[4] Print Belt Character Set: Specify one. Available at time of manufacture only. See Print Belt in M 10000 pages if more than one print belt is required.

#9490 -- 48 Character Set, EBCDIC
#9491 -- 64 Character Set, EBCDIC
#9492 -- 94 Character Set, EBCDIC
#9493 -- 48 Character Set, ASCII #1201 req'd on 3774
#9494 -- 64 Character Set, ASCII #1201 req'd on 3774
#9495 -- 94 Character Set, ASCII #1201 req'd on 3774


[6] 3651 Retail or Programmable Controller Attachment: Specify #9716 for attachment of a 3784 mdl 1 to a 3651 mdl A50, B50, A75 or B75. Specify #9717 for attachment of a 3784 mdl 1 to a 3651 mdl C75 or D75. Prerequisites: The 3651 mdl 50 or mdl 75 must be equipped with #8154 and have a minimum of 48K of storage. Note: Remote Power Off (#9501) not available with attachment to 3651 mdl 50 or mdl 75.

E TP/ MLC

PRICES: Mdl MRC 2 yr Purchase MMC
3784 1 $358 $305 $12,200 $83.50

Plan Offering: Plan B

Accessories: The following items are available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 pages for additional information and field installation.

FORMS STAND (#4450) -- Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

PRINT BELT, ADDITIONAL (#5811, #5812, #5813, #5821, #5822, #5823) -- Permits the customer to obtain more than one character print belt for various applications.

48-char ASCII (#5811) 64-char ASCII (#5812) 94-char ASCII (#5813)
48-char EBCDIC (#5821) 64-char EBCDIC (#5822) 94-char EBCDIC (#5823)

* ASCII Feature (#1201) on the 3774 is prerequisite.
3791 CONTROLLER Models 1A, 1B, 1C, 2A, 2B

Purpose: The IBM 3791 Controller serves as an intelligent base for clusters of operator stations attached to the 3790 Communication System. The 3791 communicates with the Host System (any virtual storage) via 3780 or 4360 Processor** by local channel attachment to the byte or block multiplexer channel or the 3704/3705 Communications Controller over switched or non-switched lines utilizing Synchronous Data Link Control (SDLIC). Also attaches via a Communications Adapter feature on the 4331 Processor.

Model 1A [No longer available] Provides 5 million bytes* of disk storage.
Model 1B [No longer available] Provides 10 million bytes* of disk storage.
Model 1C Provides 10 million bytes* of disk storage.
Model 2A Provides 20 million bytes* of disk storage.
Model 2B Provides 30 million bytes* of disk storage.

Note: Models 1A and 1B are no longer available.

Maximum: One 3791 per 3790 system.

Highlights:

3790 Communication System #9431, #9165, #9169

When used in the 3790 Communication System, the 3791 is a programmable controller providing users with remote processing capabilities, disk storage data files and control of terminals. Flexibility of the 3791 enables the user to efficiently configure a 3790 System for initial requirements with the ability to change system hardware and functions to meet future needs. This configuration flexibility is attained by the selection of Special Feature and Specify Feature codes.

Configuration Support #9431

When used with Configuration Support #9431, the 3791 provides for attachment of 3277 Display Station models 1 and 2, 3284/3286/3287 Printers and/or models 1 and 2. The 3791 Controller will permit up to a maximum of thirty-one 3277, 3284/3286/3287 and/or 3286 devices to be attached in any combination. In addition, up to a maximum of four 3793 Keyboard-Printers can be attached to the 3791 controller unit providing a maximum possible total of 35 devices attached to the 3791 Controller. Up to three 3792 Auxiliary Control Units may also be attached.

All 3790 programs and compiled can be tested at the host computer prior to use at the remote locations, minimizing program development costs and helping assure uniformity of operation throughout the system. User-oriented application programs allow byte-by-byte and field editing, host file update, file organization option and operator viewing of 3790 programs and data sets.

Reliability, Availability and Serviceability (RAS) capabilities ensure efficient system operation by minimizing the loss of system data.

The 3790 has several features that assist in preventing unauthorized use of the system. Optional security and power-on keylocks prevent units from being made operational unless a key switch is operated. Operator-identification codes and password checking help prevent unauthorized personnel from using the system.

Configuration Support #9165

When used with this Configuration Support, the 3791 supports the functions and terminals offered by Configuration Support #9431 and provides expanded 3790 system capabilities. The additional capabilities of this Configuration Support consist of 3270 compatibility, full screen processing, RJE function, host line link speeds of up to 9600 baud, subject to carrier availability, up to 31 concurrent tasks, including the System printer tasks, ASCII support, and expanded 3790 DB/DC VTAM and TCAM host support.

* Disk storage available for use per program and data storage is configuration dependent. Minimum storage based on a maximum 3791 configuration is 3.9 to 26.5 million bytes for Configuration Support #9431. 3.4 to 25.6 million bytes for Configuration Support #9165, and 3.2 to 25.7 million bytes for Configuration Support #9195.

** See CICS pages in Programming for restrictions.

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For Configuration Support #9155
IBM 3790 Communication System Data Entry Configuration
Introduction, GA33-4550
IBM 3790 Communication System Data Entry Configuration
Guide, GA33-4552

For Configuration Support #9175
IBM 3790 Communication System/Data Entry Configuration
IBM 3760 Key Entry Station
Introduction, GA33-4560
Configuration Guidelines, GA33-4562
Functional Description, GA33-4561
IBM 3790 Communication System
Installation Manual - Physical Planning, GA27-2769
IBM 3790 Communication System/Data Entry Configuration

For Configuration Support #9195
IBM 3790 Communication System/Data Entry Configuration
IBM 3762 Payment Transaction Processor
Introduction, GA33-4570
Configuration Guidelines, GA33-4572
Functional Description, GA33-4571
IBM 3790 Communication System
Installation Manual - Physical Planning, GA27-2769
IBM 3762 Payment Transaction Processor
Paper and Printing Requirements, GA33-4576
Document Gauge, GX33-8505

IBM 3790 Communication System/Data Entry Configuration

Communications Facilities: SDLC using switched point-to-point lines at speeds of up to 4800 bps, or non-switched point-to-point, or non-switched multipoint lines at speeds of up to 9600 bps via the 3704 or 3705. Also attaches via a Communications Adapter feature on the 4331 Processor. See M 2700 pages.

Host/3791 Communications:
Byte and/or Block Multiplexor Channel
1200 BPS Integrated Modem, Non-switched and Switched
IBM 3863 Modem, Non-switched and Switched
IBM 3864 Modem, Non-switched and Switched
IBM 3865 Modem, Non-switched
IBM 3872 Modem, Non-switched and Switched
IBM 3874 Modem, Non-switched and Switched
IBM 3875 Modem, Non-switched

PREREQUISITE: Direct attachment to a 5370 or 4300 Processor byte and/or block multiplexor channel with Local Channel Attachment (#1515) or remote attachment utilizing one SDLC Communications feature (#6301, #6302 or #6303) for Host system communications.

Communications with a 3704, 3705 or Communications Adapter on 4331 Processor is via a 1200 BPS Integrated Modem (#5500, #5501), or an external modem attached via the EIA Interface (#3701) feature. See M 2700 pages.

To operate a Configuration Support System (#9431, #9165 or #9169) at least one 3793 Keyboard-Printer or 3277 Display Station with Keyboard is necessary.

To operate a 3790 Communication System/Data Entry Configuration (#9155 or #9175) at least one 3790 key entry station mod 1 or 3 is necessary. For Configuration Support #9195 at least one 3762 Payment Transaction Processor or 3760 Key Entry Station mod 1 or 3 is necessary.

Bibliography: GC20-0370

SPECIFY: For details pertaining to specify codes, refer to Configuration Support #9431, #9165 or #9169 Configurator, GA27-2768-7, or 3790 Communication System/Data Entry Configuration (9155) Configurator, GA33-4552, (#9175) Configuration Guidelines, GA33-4562, or (#9195) Configuration Guidelines, GA33-4572.

[1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Moisture proof plug –

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3791 Controller Models 1A, 1B, 1C, 2A, 2B (cont’d)

Configuration: For each 3790 System Configuration Support (#9431, #9165, #9169, or #9195) the 3791 must be conditioned to support the function being provided and the terminals attached. Future modifications to a 3790 System must be specified by changes to the configuration features for the 3791.

IBM 3790 Communication System (#9431, #9165 or #9169)
The selection of the following function and attachment specify codes is required to complete the 3791 Configuration order. Field Installation: Yes, Limitation: Not available with Configuration Support #9165, #9175 and #9195. Purchase customers must submit an RPQ for field conversion from #9431 or #9169.

Device/Facility 3791 Controller

3792 Attachment

9110  First 3792
9120  Second 3792
9130  Third 3792

3793 Attachment

9011  Specify total number of 3793s attached by ordering quantity. Maximum: 2 with #9431; 3 with #9165 or #9169. Prerequisite: #9431, #9165 or #9169.

Maximum 4 with #9431; 3 with #9165 or #9169. Prerequisite: #9431, #9165 or #9169.

2727, 3284, 3286, 9200  Specify total number of devices attached by ordering quantity. Maximum: 31. Prerequisite: #9431, #9165 or #9169.

Attachment

9250  Specify for any attached model 2 device. Maximum: 1. Prerequisite: #9431 or #9165.

3792 Auxiliary Control Unit

Prerequisite: #9431, #9165 or #9169.

First 3792

Second 3792

Third 3792

Specify the above codes by ordering quantity. Order once for each unit attached. NOTE: Only one 3792 line printer feature may be attached to a 3790 System. The one printer can be attached to any one of the 3792 Auxiliary Controllers. See “Limitations” in 3792 Machines pages for details.

Support Functions - #9431 and #9165

Configuration Support #9165 provides all the functions of Configuration Support #9431. Some of the functions may not require ordering for Configuration Support #9165. Prerequisites will determine requirements for #9431 or #9165.

Functions  Specify#  Comment

Line Printer 9561  132 print positions. Prerequisite: #9431 or #9165.

9562  96 character print belt. Prerequisite: #9431.

Print Data Set (specify one) 9421  1024 Records
9422  2048 Records
9423  4096 Records
9424  8192 Records

Prerequisite: #9431 or #9165.

Transaction Data Set (specify one) 9771  1024 Records
9772  2048 Records
9773  4096 Records
9774  8192 Records

Prerequisite: #9431 or #9165.

Control Storage Configuration 9531  Control Storage Configuration 1
9532  Control Storage Configuration 2
9533  Control Storage Configuration 3

Prerequisite: #9431.

Additional 3790 Functions 9430  Optional, order only if required. Prerequisite: #9431.

Expanded Program 9142  Optional, order only if required. Prerequisite: #9431 and #9430. See Note 1.

Batch Data Exchange via Diskette/Tape 9037  Optional, order only if required. Prerequisite: One #9431 or #9165 and #6301, #6302, #6303 or #1515.

Configuration Conversion 9350  Optional, order only if required. Prerequisites: #9431 and #9142, #9430, #9174 and #9145.

Note 1: Machines shipped prior to July 1, 1976 and not at Factory EC level 744209 or higher cannot take advantage of the installation assist function of Specialty Feature #9142. Configuration Support #9165 can be field installed on these machines but requires reinstall of the database. See Field Installation of Special Features #3220 and #3221.

Note 2: Machines shipped prior to July 1, 1976 and not at Factory EC level 744565 or higher cannot install Specialty Feature #9350 on Configuration Support #9169. Models 2A and 2B with serial numbers 20113 through 20190, excluding numbers 20165, 20190 and 19745, must have Field EC 746445 installed with Configuration conversion #9350 on second and third position disk storage files to avoid reinstall later for feature #3221 on these files.

User Data Set 9501  For second add’l 16 user Data Sets. Maximum: 1. Prerequisite: #9431 or #9165.

9502  For second add’l 16 user Data Sets. Maximum: 1. Prerequisite: #9431 or #9165.

User Sessions 9344  Optional number of 31 available. When specified, Minimum: 1. Maximum: 16 with #9431... 31 with #9165. Prerequisite: #9431 or #9165.


9150  Specify #9150 once for each device that is operational when host is active. Prerequisite: #9431.

9151  Specify #9151 once for each additional device that is operational when host is inactive. Prerequisite: #9431.

RJE Function 9541  Specify only if required. Prerequisite: #9165.

9542  RJE Console. One required. Prerequisite: #9541.

9543  Specify if RJE Reader is required. Prerequisite: #9541. Maximum: 1.

9544  Specify if RJE Writer is required. Maximum: 1. Prerequisite: #9541.

9545  Line Printer. Maximum: 2. Prerequisite: #9541.

9546  RJE Logical Unit. Minimum: 1. Maximum: 5. Prerequisite: #9541.

Test Site 9595  To designate a 3791 location as a test site for Mandatory Control Code Engineering Changes.

Alternate Mailing Address 9596  To designate that an alternate mailing address is available for control code engineering changes.

Support Functions - #9169

Configuration Support #9169 provides all the functions of Configuration Support #9431 and #9165. Only the following functions require ordering for Configuration Support #9169.

Function  Specify#  Comment

Line Printer 9561  132 print positions. Prerequisite: #9169.


Batch Data Exchange via Diskette 9037  Optional, order only if required. Prerequisite: #9169 and #6301, #6302, #6303 or #1515.

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The selection of the following function and attachment specify #9175, #9195).

PRICES: Mdl 

Prerequisite: #9155, #9175 or #9195. 

MODEL UPGRADE

Function Specify# Comment 
Concurrency 9060 Specify if 1 thru 9. Stations are active during data transmission to or from the host. Concurrency is not supported with 10 to 12 3760s active during data transmission to or from the host. Field Installation: Yes. Prerequisite: #9155. 

1 thru 6 stations 9156 Specify if 6 is maximum number of stations planned for attachment. Field Installation: Yes. Prerequisite: #9155, #9175 or #9195. 

1 thru 9 stations 9157 Specify if 9 is maximum number of stations planned for attachment. Field Installation: Yes. Prerequisite: #9155, #9175 or #9195. 

1 thru 12 stations 9158 Specify if 12 is maximum number of stations planned for attachment. Field Installation: Yes. Prerequisite: #9155, #9175 or #9195. 

User programmable subroutines 9850 Specify only if required. Prerequisite: #9175 or #9195 and #7500. 

Line Printer 9561 132 print positions. Prerequisite: #9175 or #9195. 

Test Site 9595 To designate a 3791 location as a test site for mandatory control code engineering changes. 

Alternate Mailing Address 9596 To designate that an alternate mailing address is available for control code engineering changes. 

Field conversion charge for Model 1A to Model 2A is by RPQ 

Field conversion charge for Model 2A to Model 2B is $6,100. 

Field conversion charge for Model 1C to Model 2A is $6,100 ... from Model 1C to Model 2B is $12,200. 

** Customer price quotations and customer order acknowledgement letters for purchase must state: Installation of the model change involves the removal of parts which become the property of IBM. 

SPECIAL FEATURES 


ADDITIONAL DISK HEADS (#3220, 3221). [#3220 for Mdl 1A ... #3221 for Mdl 1B, 1C, 2A, 2B] Provides additional disk heads necessary for use with Configuration Support #9155, #9165, #9169, #9175 or #9195. Maximum: One for #9155 and #9165 ... three for #9195, #9175 and #9195. Field Installation: Yes. Machines shipped prior to July 1, 1976 and not at EC level 744209 require the removal of disk storage. Mdl(s) 2A and 2B with serial numbers 20113 thru 20196, excluding numbers 20165, 20190 and 20194, at factory EC level 744209 require removal of disk storage in the second and third positions to field install #3221. See chart below to verify replacement requirement of each disk storage (enclosure). 

ADDITIONAL DISK HEADS (#3220, 3221). [#3220 for Mdl 1A ... #3221 for Mdl 1B, 1C, 2A, 2B] Provides additional disk heads necessary for use with Configuration Support #9155, #9165, #9169, #9175 or #9195. Maximum: One for #9155 and #9165 ... three for #9195, #9175 and #9195. Field Installation: Yes. Machines shipped prior to July 1, 1976 and not at EC level 744209 require the removal of disk storage. Mdl(s) 2A and 2B with serial numbers 20113 thru 20196, excluding numbers 20165, 20190 and 20194, at factory EC level 744209 require removal of disk storage in the second and third positions to field install #3221. See chart below to verify replacement requirement of each disk storage (enclosure). 

Adequate provision must be made for retaining data contained on all disk storage in each channel and elimination of user proprietary information. All replaced parts become the property of IBM. 

Limitations: One is required on a mdl 1A, 1B or 1C for Configuration Support #9155. One is required on a mdl 1A, 1B, 1C, 2A or 2B for Configuration Support #9155 or #9195. With Configuration Support #9175 and #9195 one is required on a mdl 1B or 1C, two are required on a mdl 2A, and three are required on a mdl 2B. Not available with #9431. Prerequisite: Configuration Support #9155, #9165, #9169, #9175 or #9195. 

LINE PRINTER - 80 PRINT POSITIONS 155 LPM (#4710). Provides a line printer with maximum speeds of 155 LPM (48 character set, 120 LPM with 64 character set and 80 LPM with 96 character set. Included as standard is one operator interchangeable print belt (48, 64 or 96 character set). ASCII or EBCDIC character set must be specified. Capability to print on continuous fan fold paper up to 80 print positions on an 8-inch (20 cm) print line with line spacing of 6 lines per inch (2.54 cm). Paper up to six parts plus carbon (maximum total thickness is .020 inches or .50 mm) can be accommodated. Maximum paper width is 15" overall. Refer to form design reference guide for printers (GA24-3488) for form design considerations. Card stock is not recommended. A form jam detection capability is provided. Order IBM Part No. 1136634 or equivalent, for replacement ribbons. Maximum: One. Limitations: Line printers on the 3791 and 3792 must have the same number print positions. The 48, 66 and ASCII character sets are not available with Configuration Support #9155. The 96 and ASCII character sets are not available with Configuration Support #9175 or #9195. With Configuration Support #9155 the Line Printer (#4710) can be used during data transmission between the 3791 and the host when the system is configured for concurrency. Field Installation: Yes. Specify: See "Print Belt Character Set" under Option. Specify for ordering 48, 64 or 96 character sets. 

LINE PRINTER - 132 PRINT POSITIONS 155 LPM (#4711). Provides a line printer with maximum speeds of 155 LPM with 48 character set, 120 LPM with 64 character set and 80 LPM with 96 character set. Included as standard is one operator interchangeable print belt (48, 64 or 96 character set). ASCII or EBCDIC character set must be specified. Capability to print on continuous fan fold paper up to 132 print positions on a 13.2-inch (33.5 cm) print line with line spacing of 6 lines per inch (2.54 cm). Paper up to six parts plus carbon (maximum total thickness is .020 inches or .50 mm) can be accommodated. Refer to form design reference guide for printers (GA24-3488) for form design considerations. 

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**3791 Controller Models 1A, 1B, 1C, 2A, 2B** (cont'd)

Card stock is not recommended. A form jam detection capability is provided. Order IBM Part No. 1136654 or equivalent, for replace­ment ribbons. Maximum: One. Field Installation: Yes.

See "Print Belt Character Set" under Specify for ordering 48, 64 or 96 character sets. Limitations: Line printers on the 3791 and 3792 must have the same number print positions. Not available with Configuration Support #9195 or #9169.

**LINE PRINTER - 132 PRINT POSITIONS 410 LPM (#4715).** Provides a higher speed line printer with maximum speeds of 410 LPM with 48 character set, 300 LPM with 64 character set, and 230 LPM with 96 character set. Interchangeable as standard is one Station, or any combination of four with Configuration Support #9115. The 96 and ASCII character sets are not available with Configuration Support #9175 or #9195.

**LINE PRINTER - 132 PRINT POSITIONS 540 LPM (#3211).** Provides a higher speed line printer with maximum speeds of 540 LPM with 48 character set, 300 LPM with 64 character set, and 225 LPM with 96 character set. Interchangeable as standard is one Station or any combination of four with Configuration Support #9115. The 96 and ASCII character sets are not available with Configuration Support #9175 or #9195.

**MAGNETIC TAPE ATTACHMENT (#7840).** Provides for the attachment of the 3411 Magnetic Tape Unit and Control mdl 1. Additional tape capacity is provided by attachment of the 3410 Magnetic Tape Unit mdl 1 via the 3411. The total number of tape units (3411 and 3410) on a 3791 Controller is four. Maximum: One. Field Installation: Yes. Prerequisite: 3790 System Attachment (#7003), Single Density (#3211) or Dual Density (#3221) on the 3411 and 3791 Configuration Support #9169, #9195 or #9431. Restrictions: Not available with Configuration Support #9115, #9165 or #9431. Limitations: Configuration Support #9175 and/or #9195 do not support attachment of the 3411 Single Density (#3211) and Dual Density feature (#3221) are supported by the 3791 Controller.

**DEVICE ATTACHMENT TYPE I (#7900).** Allows attachment of up to three 3792 Auxiliary Control Units or four 3760 Dual Key Entry Station mdl 1s or four 3760 Dual Key Entry Station mdl 3s or four 3762 Payment Transaction Processors or any combination of four of these stations at a distance of 2000 feet. Each 3760 mdl 1 can attach up to two 3760 mdl 2s. Maximum: One. Field Installation: Yes. Limitations: All attached units must be the same type except for #9195 which allows mixing of 3760 and 3762 units. Prerequisite: Configuration Support (#9115, #9195 or #9431) or Configuration Support #9165 for 3760 and 3762 attachment or (#9431, #9165 or #9195) for 3792 attachment.

**DEVICE ATTACHMENT TYPE I, ADDITIONAL (#7922).** Attaches up to four 3760 Dual Key Entry Station mdl 1s or four 3760 Key Entry Station mdl 3s or four 3762 Payment Transaction Processors or any combination of four of these stations at a distance of 2000 feet. Each 3760 mdl 1 can attach up to two 3760 mdl 2s. Maximum: One. Field Installation: Yes. Limitation: A maximum of twenty-four operator positions is supported for attachment to a 3791 Controller. Prerequisite: Configuration Support (#9115, #9165 or #9195) and Device Attachment Type I (#7900). Not available with Configuration Support #9431, #9165 or #9195.

**3793 ATTACHMENT (#7901).** To attach one 3793 Overlay Printer to the 3791 ... see 3793 details. Maximum: Four per 3791 mdls 1C, 2A and 2B ... one per 3791 mdls 1A and 1B. Models 1A and 1B require 3793 Attachment - Second (#7902) for a second 3793 and 3793 Attachment - Fourth (#7904) for a fourth ... maximum of two with Magnetic Tape Attachment (#7840). Field Installation: Yes. Limitations: Cannot be installed with Configuration Support #9195 or #9165. For Configuration Support #9165 the maximum is three. For Configuration Support #9431 the maximum is three when Control Storage Increment Type II (#1612) is installed. For Configuration Support #9195 the maximum is three, however, if Control Storage Increment Type II (#1612) or more than one Type IIA (#1610) is installed the maximum is one.

**3793 ATTACHMENT - SECOND (#7902).** [Mdl 1A or 1B only] To attach a second 3793 to a 3791 mdl 1A or 1B. Maximum: One. Field Installation: Yes. Limitations: Not available with Configuration Support #9431 when Control Storage Increment Type II (#1612) or more than one Control Storage Increment Type IIA (#1613) is installed. Prerequisite: 3793 Attachment (#7901).

**3793 ATTACHMENT, ADD'L (#7903).** [Mdl 1A or 1B only] To attach a third or fourth 3793 to a 3791 mdl 1A or 1B. Maximum: Two. Field Installation: Yes. Prerequisite: 3793 Attachment - Second (#7902). Limitations: If Control Storage Increment Type II (#1612), or Type IIA (#1613) is installed, only three 3793s can be attached with Configuration Support #9165 or #9195, the maximum is three 3793s. Not available with Magnetic Tape Attachment (#7840).

**DEVICE ATTACHMENT TYPE II (#7911).** Allows attachment of up to any combination of four 3727s, 3284s, 3286s, 3287s and/or 3288s to the 3791. Maximum: Seven, but restricted to a maximum of 31 devices. Field Installation: Yes. Limitation: If printer feature #4710, #4711 or #4715 is attached, maximum number of 3277, 3284, 3286, 3287 and/or 3288 devices is restricted to thirty. If a 3792 is attached, maximum six, with a maximum of 28 devices. The attachment of a line printer feature does not reduce the maximum of 28 devices. Prerequisite: Device Attachment Type II (#7911).

**CONTROL STORAGE FEATURES**

The amount of control storage to be ordered for the "3790 Communication System Configuration" (#9155, #9165, #9195 or #9175) is dependent on the quantity and type of attachments in the system configuration. See "3790 Communication System Configurator" GA27-2768-5 for the correct ordering quantities of control storage.

The amount of control storage for the "3790 Communication System/Data Entry Configuration" (#9155) is defined by the prerequisite for Configuration Support #9175 or #9195.

**CONTROL STORAGE EXPANSION (#1590).** Provides capability of expanding control storage. Maximum: One. Field Installation: Yes. Prerequisite: Configuration Support #9431, #9155, #9165, #9195 or #9175. Limitation: #1590 required for Configuration Support #9155, #9165, #9195 or #9175. Not available with #9169.

**CONTROL STORAGE EXPANSION - TYPE I (#1591).** Provides the amount of control storage to be ordered for the "3790 Communication System/Data Entry Configuration" (#9175 or #9195) defined by the prerequisite for Configuration Support #9175 or #9195.

**CONTROL STORAGE INCREMENT - TYPE I (#1602).** Provides 8,192 positions of additional control storage. Maximum: One. Field Installation: Limited to those machines shipped after July 1, 1976 and at Factory EC Level 1744565 or higher. Prerequisite: Configuration Support #9165. Limitations: Cannot be installed with Control Storage Expansion (#1590). Purchase customers must submit an RPQ for a field change from Control Storage Expansion (#1590).

**CONTROL STORAGE INCREMENT - TYPE II (#1603).** Provides 16,384 positions of additional control storage. Maximum: Three for #9431 or #9165; one for #9155, #9175 or #9195, seven for #9169. Field Installation: Yes. Prerequisite: Control Storage...
3791 Controller Models 1A, 1B, 1C, 2A, 2B (cont'd)
Expansion (#1590) for Configuration Support #9431, #9155, #9165. Or Control Storage Expansion Type I (#1591) for Configuration Support #9169. Limitation: Three #1603s are required for Configuration Support #9165, six #1603s or nine for Configuration Support #9169 and one is required for #9175 or #9195.

CONTROL STORAGE INCREMENT - TYPE II (#1612). Provides 6,192 positions of additional control storage. Maximum: One for #9431, #9155 and #9165. Field Installation: Yes. Prerequisite: Control Storage Expansion Type I (#1590) for Configuration Support #9431 or #9155. Control Storage Expansion Type I (#1591) for Configuration Support #9169. Limitation: Not available with Configuration Support #9165, #9175 or #9195. See Note below.

CONTROL STORAGE INCREMENT - TYPE IIA (#1613). Provides 16,384 positions of additional control storage. Maximum: One for #9155, #9165 and #9431, five for #9169, three for #9175 and #9195. Field Installation: Yes. Prerequisite: Control Storage Expansion Type I (#1590) for Configuration Support #9431, #9155, #9165 or #9195. Or Control Storage Expansion Type I (#1591) for Configuration Support #9169. Limitation: One #1613 is required for Configuration Support #9165 and #9169. Three are required for #9175 or #9195. See 3793 Attachment features (#7901, #7902, #7903) for additional restrictions.

NOTE: Customers who elect to purchase Storage Increment Type I or Type II and plan to order additional storage at a later date, should consider purchase of Storage Increment Type IIA or Type IIA initially. The field upgrade of storage may require replacement of initial feature and installation of new feature.

COMMUNICATIONS FEATURES

EIA INTERFACE (#3701). Provides EIA interface for attachment of an IBM or other external modem. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with #5500 or #5501. Prerequisite: SDLC Communications Feature with or without Business Machine Clock (#6301, #6302 or #6303).

1200 BPS INTEGRATED MODEM - NON-SWITCHED (#5500). Provides an integrated modem for communications with the host system over switched lines. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with #6301, #6302 or #6303. Prerequisite: SDLC Communications Feature with Business Machine Clock (#6301).

1200 BPS INTEGRATED MODEM - SWITCHED (#5501). Provides an integrated modem with answering capability for communications from the host system over switched lines via a Telephone Company supplied Data Access Arrangement Type CBS, DAA or FCC, or equivalent. Maximum: One. Field Installation: Yes. Limitation: Cannot be installed with #3701, #5500, #6302 or #6303. Prerequisite: SDLC Communications Feature with Business Machine Clock (#6301).

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6302). Required for attachment to communications lines through the 1200 BPS Integrated Modem (#5500, #5501) or, via an EIA Interface (#3701) at 1200 bps, to any external modem which does not provide its own clocking. Maximum: One. Limitation: Cannot be installed with #1515, #6302 or #6303. Field Installation: Yes.

SDLC COMMUNICATIONS FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6303). Required for attachment to communications lines via an EIA Interface (#3701) and external modem which provides its own clocking up to 2400 bps with #9431 or #9165, and up to 4800 bps with #9155, #9175 or #9195. Maximum: One. Limitation: Cannot be installed with #1515, #5500, #5501, #6301 or #6303. With Configuration Support #9155, #9175 and #9195, up to six stations may be active concurrently with communications between 3791 and the host. Field Installation: Yes.

SDLC COMMUNICATION FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6304). Required for attachment to communications lines via an EIA Interface (#3701) and external modem which provides its own clocking of up to 9600 bps. Maximum: One. Limitation: Cannot be installed with #1515, #5500, #5501, #6301, #6302 or Configuration Support #9431, #9155, #9175 or #9195. Field Installation: Yes.

DATA LINK ADAPTER

The Data Link Adapter provides the capability for the 3791 Controller to attach via non-switched communication lines the 3276 Control Unit Display Station mds 2, 3, 4, 12, 13 and 14, with the appropriate 3272 Display Station mds 2, 3 or 4, 3287 mdl 1 or 2 printers or 3781 line printers. The 3791 Controller supports only SDLC communication and the 1920 character format on the Data Link Adapter. 3276 mdl 2, 3 and 4 attached to a 3791 require the EIA/CCITT Interface (#3703) with the Data Link Adapter (#3210 or #3211) at speeds of up to 9600 bps or the Integrated Modem (#4781) with the Data Link Adapter (#3210) at speeds of 1200 bps. See M 2700 pages for available communications facilities.

The maximum number of Data Link Adapter features (#3210 or #3211) attached to a 3791 Controller is five. The maximum number of 3276 control units that can be attached to each Data Link Adapter is five to a 3791 Controller. The 3790 will allow the attachment of a total of 80 units and devices in any combination on the five Data Link Adapters. See 3270 pages for restrictions.

3791 TERMINAL COMMUNICATIONS

1200 bps Integrated Modem - Non-switched*
IBM 3683 Modem
IBM 3684 Modem
IBM 3685 Modem
IBM 3872 Modem**
IBM 3874 Modem**

* Half speed or 600 bps is not attainable.
** If Switched Network Back-up, switching is done manually.

DATA LINK ADAPTER WITH BUSINESS MACHINE CLOCK (#3210). Required for attachment to data link through the 1200 bps Integrated Modem (#4781) or via an EIA/CCITT Interface (#3703) at 1200 bps, to any external modem which does not provide its own clocking. Maximum: Five. The maximum is reduced by one for each #3211 attached. Field Installation: Yes. Limitation: All 3276s and 3278s must have keyboards. Cannot be installed with Configuration Support #9155, #9165, #9431, #9175 or #9195. Prerequisite: Configuration Support #9169.

DATA LINK ADAPTER WITHOUT BUSINESS MACHINE CLOCK (#3211). Required for attachment to data link via an EIA/CCITT Interface (#3703) and external modem which provides its own clocking of up to 9600 bps. Maximum: Five. The maximum is reduced by one for each #3211 attached. Field Installation: Yes. Limitation: Cannot be installed with Configuration Support #9155, #9165, #9431, #9175 or #9195. Prerequisite: Configuration Support #9169.

DATA LINK ADAPTER WITH BUSINESS MACHINE CLOCK (#3210). Provides EIA/CCITT interface for attachment of an IBM or other external modem. Maximum: Five. Field Installation: Yes. Prerequisite: Data Link Adapter (#3210 or #3211).

1200 BPS INTEGRATED MODEM - NON-SWITCHED (#4781). Provides an integrated modem for communications from the Data Link Adapter over non-switched lines. No external modem is required. Field Installation: Yes. Limitation: Cannot be specified. Unless otherwise specified, 4-wire strapping will be provided. Specify #9654 for 2-wire strapping. Maximum: Five. Field Installation: Yes. Prerequisite: Data Link Adapter (#3210). SECURITY KEYLOCK (#6350). Allows the 3791 to be power-on only with a key. Removing the key does not turn power off. For additional or replacement keys, see M 10000 pages. Maximum: One. Field Installation: Yes.

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3791 Controller Models 1A, 1B, 1C, 2A, 2B (cont’d)

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**Control Storage Increment**

| Type | 1602 | 32 | 27 | 637 | 5.00 |
| Type IA | 1603 | 58 | 49 | 1,170 | 10.00 |
| Type II | 1612 | 32 | 27 | 637 | 5.00 |
| Type IIA | 1613 | 58 | 49 | 1,170 | 10.00 |

**Data Link Adapter**

| w Bus Mach Clock | 3210 | 41 | 35 | 1,400 | 11.00 |
| w/o Bus Mach Clock | 3211 | 35 | 30 | 1,200 | 10.00 |

**Add’l Disk Heads**

| - mdl 1A | 3220† | 32 | 27 | 1,080 | 17.00 |
| - mdls 1B, 1C, 2A, 2B | 3221† | 32 | 27 | 1,080 | 17.00 |

**EIA Interface**

| EIA/CCITT Interface | 3701 | 12 | 10 | 400 | 4.00 |

**Data Link**

| Line Printer 155 LPM | 4710 | 177 | 151 | 6,175† | 56.00 |
| 80 Print Positions | 4711 | 199 | 169 | 6,825† | 59.50 |

**Line Printer 410 LPM**

| 132 Print Positions | 4715 | 351 | 299 | 11,960 | 114.00 |

**1200 bps Integrated Modem -**

| Non-switch (Data Link) | 4781 | 25 | 21 | 840 | 7.00 |
| Non-switched | 5500 | 19 | 16 | 630 | 5.00 |
| Switched | 5501 | 25 | 21 | 860 | 7.00 |

**SDLC Communications Feature**

| w Bus Machines Clock | 6301 | 19 | 16 | 670 | 3.00 |
| w/o Bus Mach Clock | 6302 | 12 | 10 | 450 | 2.50 |

**Security Keylock**

| 6350 | 35 | 30 | 1,200 | 10.50 |

**Magnetic Tape Attach**

| 7900 | 36 | 31 | 1,300 | 4.00 |
| 7901 | 36 | 31 | 1,300 | 3.00 |
| 7902 | 36 | 31 | 1,300 | 3.00 |
| 7903 | 36 | 31 | 1,300 | 3.00 |

**Dev Attach, Add’l Type I**

| 7911 | 32 | 27 | 1,100 | 3.00 |

**Add’l Disk Heads**

| - mdl 1A | 3220† | 32 | 27 | 1,080 | 17.00 |
| - mdls 1B, 1C, 2A, 2B | 3221† | 32 | 27 | 1,080 | 17.00 |

**EIA Interface**

| EIA/CCITT Interface | 3701 | 12 | 10 | 400 | 4.00 |

**Line Printer**

| 155 LPM Max | 48-character EBCDIC/ASCII (#5821) | 64-character EBCDIC (#5822) | 94-character EBCDIC (#5823) | 64-character ASCII (#5812) | 94-character ASCII (#5813) |
| 410 LPM Max | 48-character EBCDIC/ASCII (#5825) | 64-character EBCDIC (#5826) | 94-character EBCDIC (#5827) | 64-character ASCII (#5816) | 94-character ASCII (#5817) |

**ACCESSORIES:** The following items are available on a purchase basis only. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

**FORMS STAND (#4450)**

- [For feature codes #4710 and #4711 only] Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing. The forms stand for feature code #4715 is an integral part of the feature.

**PRINT BELT, ADD’L**

- Permits the customer to obtain more than one character set print belt for various applications.

155 LPM Max

- 48-character EBCDIC/ASCII (#5821)
- 64-character EBCDIC (#5822)
- 94-character EBCDIC (#5823)
- 64-character ASCII (#5812)
- 94-character ASCII (#5813)

410 LPM Max

- 48-character EBCDIC/ASCII (#5825)
- 64-character EBCDIC (#5826)
- 94-character EBCDIC (#5827)
- 64-character ASCII (#5816)
- 94-character ASCII (#5817)

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IBM 3791 CONTROLLER Models 11C, 12A, 12B

Purpose: The 3791 Controller, models 11C, 12A or 12B, serves as an interface base for clusters of operator stations attached to the 3730 Distributed Office Communication System.

Model 11C Provides 10 million bytes* of disk storage
Model 12A Provides 20 million bytes* of disk storage
Model 12B Provides 30 million bytes* of disk storage

* The minimum disk storage available for data storage and user programs (based on a maximum 3791 configuration) is: Model 11C - 5.5 million bytes ... Model 12B - 24.1 million bytes.

Maximum: One 3791 per 3730 system.

Highlights: The 3791 Controller model 11C, 12A or 12B, with Configuration Support #9171 installed, serves as the controller for the 3730 Distributed Office Communication System to support the 3730 functions of document creation, editing, storage, retrieval, formatting, printing, archiving, and (with #9275) automated text.

Additional controller features and facilities include:
- Non-removable disk storage for customer use
- Line printer feature
- Host system attachment (with #9265) through an SDLC communications feature, or through a local channel attachment feature

Communication Facilities: Direct attachment to S/370, 4300, or 3031, 3032, or 3033 processor byte and/or block multiplexer channel using Local Channel Attachment (#1515).

Synchronous Data Link Control (SDLC) using switched point-to-point lines at speeds of up to 2400 bps, or non-switched point-to-point, or non-switched multipoint lines at speeds of up to 9600 bps subject to carrier availability via the 3704 or 3705. See M 2700 pages.

For the 3791-to-3704/3705 SDLC link, IBM offers a 1200 bps integrated modem or an EIA feature for the attachment of external modems.

Note: For communication capabilities and modem attachment data, see 3863, 3864, 3865, 3872, 3874, 3875 and M 2700 pages.

Host/3791 Communication

Byte and/or block multiplexer channel
1200 bps Integrated Modem, Non-switched
1200 bps Integrated Modem, Switched
3863 Modem, Non-switched (2400 bps)
3861 Modem, Switched (2400 bps)
3872 Modem, Non-switched (2400 bps)
3872 Modem, Switched (2400 bps)
3854 Modem, Non-switched (4800 bps)
3854 Modem, Switched (4800 bps)
3874 Modem, Switched (4800 bps)
3875 Modem, Non-switched (7200 bps)
3865 Modem, Non-switched (9600 bps)

PREREQUISITES: Local Channel Attachment feature (#1515), or one SDLC Communication Feature (#6301, 6302 or 6303) is required for CE maintenance purposes.

To operate on 3730 system, at least one 3732 Text Display Station with keyboard, and either a 3736 Printer or a 3791 Line Printer feature is required.

Test Site Designation (#9595) The purpose of #9595 is to provide the 3730 customer with the ability to designate a test site location at which to install a Mandatory Microcode Engineering Change. Receipt of changes at this location will occur before a new production unit can reach the customer network and before the change is distributed to other installed locations requiring the change. This feature should be limited to one per network.

3791 Alternate Mailing Address (#9596) for Microcode Updates #9596 provides the 3730 customer with the option of having Mandatory Microcode updates shipped to a single address, generally a central site, for better network management control. The alternate address is controlled as a Teleprocessing Control Number (TCP#) or Microcode Control Number (MC#). Redistribution of the microcode is the responsibility of the customer.

Publications: Refer to the latest level of IBM System/370 Bibliography of Industry Systems and Application Programs, GC20-0370, for details of 3791 and 3730 system publications.

SPECIFY: For details of specify codes, refer to 3790 Communication System Configurator, GA27-2768.

[1] Voltage (AC, 1-phase, 3-wire, 60Hz): Moisture proof plug -- #9902 for 208 V, or #9904 for 230 V. For Locking plug -- #9904 for 208 V, or #9986 for 230 V.

[2] Color: Available at time of manufacture only. #9041 for Red, #9042 for yellow, #9043 for Blue, or #9045 for gray.

[3] Up-ending Kit: In the event the 3791 must be placed on end to enter installation area, specify #9840.


[5] ASCII Support: Specify #9022. ASCII support is provided for the host link, diskette, 3277, 3278, 3287, 3288, 3732, 3736, and 3791 Line Printer (#4710, 4711 or 4715). Only ASCII support type B is provided for the 3287, 3732 and 3736. Prerequisite: #9171 with #9275.

[6] Print Belt Character Set: Specify for 3791 Line Printer (feature codes #4710, 4711 or 4715) one of the following. These specify codes are available at time of manufacture only. If additional print belts are required, see "Print Belts" in M10000 pages. The 48-character and 128-character print belts can be used for ASCII or EBCDIC.

#9071 48-character set, ASCII
#9074 64-character set, ASCII
#9075 96-character set, ASCII
#9076 128-character set, DP WP EBCDIC - Courier (1)
#9078 96-character set, WP EBCDIC - Artisan (2)

(1) Allows text and data to be printed in 3730-3790 systems without the need to change print belts.

(2) Cannot be installed with Feature Code #4715.

[7] Configuration Support: Specify #9171 for 3730 Distributed Office Communication System, including support for 3732 Text Display Station and 3736 Printer. Prerequisite: None. Field installation: Yes. Limitation: Not available with model 1A, 1B, 1C, 2A or 2B, or with Configuration Support #9431, #9155, #9165, #9169, #9175 or #9195.

[8] Configuration: The following function and attachment specify codes must be selected to support the terminals to be attached to a 3791 model 11C, 12A or 12B.

**Attachment**

Specify      Comment
3793 Attachment      #9011 Specify that a 3793 is to be attached by ordering quantity. Maximum: One. Prerequisite: #9275.
3277, 3284, 3286, 3287, 3288 Attachment      #9200 Specify total number of devices attached by ordering quantity. Maximum: 28. Prerequisite: #9275.
3732, 3736 Attachment      #9016 Specify combined total of 3732s and 3736s by ordering quantity. Maximum: 30 if #9275 is specified ... 16 if #9275 is not specified. Prerequisite: None.

**Support Functions**

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<td>Line Printer</td>
<td>#9561</td>
<td>132 print positions.</td>
</tr>
<tr>
<td>Test Site</td>
<td>#9595</td>
<td>To designate a 3791 location as a test site for Mandatory Control Code Engineering Changes. Prerequisite: #9285. Limitation: One per network.</td>
</tr>
<tr>
<td>Alternate Mailing Address</td>
<td>#9596</td>
<td>To designate that an alternate mailing address is available for microcode updates. Prerequisite: None.</td>
</tr>
<tr>
<td>RJE Function</td>
<td>#9541</td>
<td>Specify only if required. Cannot be installed if Magnetic Tape Attachment (#7840) is installed. Maximum: One. Prerequisite: #9285 with #9011 or #9200.</td>
</tr>
<tr>
<td>Additional User Sessions</td>
<td>#9345</td>
<td>Optional - order only if required. Provides 15 addl user sessions. (Basic system provides 16 user sessions). Maximum: One. Prerequisite: #9275.</td>
</tr>
</tbody>
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MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

FIELD CONVERSION CHARGES

Model 1C to Model 11C ..... **
Model 1C to Model 12A ..... **
Model 1C to Model 12B ..... **
Model 1A to Model 12A ..... **
Model 2A to Model 12B ..... **
Model 2B to Model 12B ..... **
Model 11C to Model 12A ..... $ 6,100
Model 11C to Model 12B ..... $12,200
Model 12A to Model 12B ..... $ 6,100

** For field conversions of purchase 3791 mdls 1C, 2A or 2B to 3791 mdls 11C, 12A or 12B, call the 3790 Marketing Center Manager for assistance in planning the model conversion.

Model upgrade requires replacement of disk storage. Adequate provision must be made for retaining data contained on disk storage unit and elimination of user-proprietary information.

SPECIAL FEATURES

SECRECY KEYLOCK (#6350). Allows the 3791 to be “powered on” only with key. Removing the key does not turn power off. For additional or replacement keys, see M10000 pages. Maximum: One. Field installation: Yes.

DEVICE ATTACHMENT FEATURES

LOCAL CHANNEL ATTACHMENT (#1515). Provides for direct attachment to any S/370 processor*, 4300 processor, or 3031, 3032 or 3033 processor, via an integrated byte and/or block multiplexer channel or via a 2870 byte multiplexer or 2880 block multiplexer channel. Maximum distance from the channel is 200 feet. Limitation: Cannot be installed with SDLC Communication Feature (#6301, 6302 or 6303). Maximum: One. Field installation: Yes.

* This feature attaches to only one channel of a multiprocessing system.

ADDITIONAL DISK HEADS (#3221). Provides additional disk heads to improve performance in certain configurations and for certain applications. Limitation: Cannot be installed on 3791 mdls 11C, 12A or 12B. One additional head on mdls 12A ... two additional heads on mdls 12B. Field Installation: Yes. Prerequisite: #9275, #9285.

MAGNETIC TAPE ATTACHMENT (#7840). Provides for the attachment of the 3411 Magnetic Tape Unit and Control Unit. Additional tape capacity is provided by attachment of the 3411 Magnetic Tape Unit mdl 1 via the 3411. The maximum number of tape units (3410 and 3411) on a 3791 is four. Limitations: Only the 3411 Single Density (#3211) and the Dual Density (#3221) are supported by the 3791. Feature #7840 cannot be installed with the RJE Function (#9541). Maximum: One. Field installation: Yes. Prerequisite: System/3-3790 Communication System Attachment (#7903) on 3411; Single Density (#3211) or Dual Density (#3221) on 3411; and 3791 Configuration Support #9171 with #9275 on 3791.

DEVICETECH ATTACHMENT TYPE II, ADDITIONAL (#7912). Each feature allows attachment of any combination of up to four additional 3277s and/or 3284, 3286, 3287, 3288, 3732, 3736s to be attached to the 3791. The following combination is supported: 3791, one or more of the following models: 3277, 3284, 3286, 3287, 3288.

CONTROL STORAGE FEATURES

The amount of control storage to be ordered for the 3730 Distributed Office Communication System (#9171) depends on both the quantity and type of attachments in the system configuration. See 3790 Communication System Configurator, GA27-2768, to determine the correct quantities of control storage.


COMMUNICATION FEATURES

EIA INTERFACE (#501). Provides EIA interface for the attachment of an IBM or other external modem. Limitation: Cannot be installed with the 1200 bps modems (#5500 or #5501). Maximum: One. Field installation: Yes. Prerequisite: S/370 Communication Feature with or without Business Machine Clock (#6301, 6302, 6303).

MODEM, 1200 BPS INTEGRATED, NON-SWITCHED (#5500). Provides an integrated modem for communication with the host system over non-switched lines. No external modem is required. Limitation: Cannot be installed with communications feature #3701, #5601, #6302 or #6303. Maximum: One. Field installation: Yes. Prerequisite: S/370 Communications Feature with Business Machine Clock (#6301). Specify: #9651 for 4-wire strapping, or #9652 for 2-wire strapping.

MODEM, 1200 BPS INTEGRATED, SWITCHED (#5501). Provides an integrated modem with an answering capability for communication from the host system over switched lines via a telephone company supplied Data Access Arrangement Type CBS, DAA or FCC, or equivalent modem. Limitation: Whether the answering capability is manual or auto. Limitation: Cannot be installed with Communications Features #3701, #5601, #6302 or #6303. Maximum: One. Field installation: Yes. Prerequisite: S/370 Communications Feature with Business Machine Clock (#6301).

SDLC COMMUNICATION FEATURE WITH BUSINESS MACHINE CLOCK (#6301). Requires attachment to communication lines through the 1200 bps Integrated Modem (#5500 or #5501) or, via an EIA Interface (#3701) to any external modem which provides its own clocking up to 2400 bps. Limitation: Cannot be installed with SDLC features #6302 or #6303 or Local Channel Attachment (#1515). Maximum: One. Field installation: Yes.

SDLC COMMUNICATION FEATURE WITHOUT BUSINESS MACHINE CLOCK (#6302). Requires attachment to communication lines via an EIA Interface (#3701) and an external modem which provides its own clocking of up to 9600 bps. Limitation: Cannot be installed with Communication Features #1515, #5500, #5501, #6301 or #6302. Maximum: One. Field installation: Yes.

LINE PRINTERS

LINE PRINTER 80 PRINT POSITIONS (#4710). [155 lpm - 6 lines per inch (2.54 cm)] Provides a line printer with maximum speed of 155 lpm with 48-character set, 120 lpm with 64-character set, 80 lpm with 96-character set, and 40 lpm with...
3791 Controller Models 11C, 12A, 12B (cont'd)

128-character set. Included as standard is one operator-interchangeable print belt (48-, 64-, 96-, or 128-character set). ASCII or EBCDIC must be specified. Capability to print on continuous fan fold paper up to 80 print positions on an 8 inch (20 cm) print line with line spacing of 6 lines per inch (2.5 cm). Paper up to six parts plus carbon (maximum total thickness is 0.50 mm (.020 inches) can be accommodated. Maximum paper width is 15 inches overall. Refer to Form Design Reference Guide for Printers (GA24-3488) for form design considerations. Card stock is not recommended. A form-jam detection capability is provided. Order IBM Part No. 1136634 or equivalent, for replacement ribbons. Maximum: One. Field installation: Yes. Specify: See "Print Belt Character Set" under "Specify" for ordering 48-, 64-, 96- or 128-character sets.

LINE PRINTER, 132 PRINT POSITIONS (#4711). [155 Ipm - 6 lines per inch (2.54 cm)] Provides a line printer with maximum speeds of 155 Ipm with 48-character set, 120 Ipm with 64-character set, 80 Ipm with 96-character set, and 40 Ipm with 128-character set. Included as standard is one operator interchangeable print belt (48-, 64-, 96- or 128-character set). Capability to print on continuous fan fold paper up to 132 print positions. ASCII or EBCDIC character set must be specified on a 33.5 cm (13.2 inch) print line with line spacing of 6 lines per inch (2.5 cm). Paper of up to six plus carbons (maximum total thickness is .020 inches or 0.50 mm) can be accommodated. Refer to Form Design Reference Guide for Printers (GA24-3488) for form design considerations. Card stock is not recommended. A form-jam detection capability is provided. Order IBM Part No. 1136634 or equivalent for replacement ribbons. Maximum: One. Field installation: Yes. Specify: See "Print Belt Character Set" under "Specify" for ordering 48-, 64-, 96- or 128-character sets.

LINE PRINTER - 132 PRINT POSITIONS (#4715). [410 Ipm] Provides a higher speed line printer with maximum speeds of 410 Ipm with 48-character set, 300 Ipm with 64-character set, 230 Ipm with 96-character set, and 160 Ipm with 128-character set. Included as standard is one operator-interchangeable print belt (48-, 64-, 96- or 128-character set) and a forms stand which is an integral part of this feature. ASCII or EBCDIC character set must be specified. Capability to print on continuous fan fold paper up to 132 print positions on a 13.2 inch (33.5 cm) print line with line spacing of 6 lines per inch (2.5 cm). Paper of up to six plus carbons (maximum total thickness is .020 inches or 0.50 mm) can be accommodated. Refer to Forms Design Reference Guide for Printers (GA24-3488) for form design considerations. Card stock is not recommended. A form-jam detection capability is provided. Order IBM Part No. 1136670 or equivalent for replacement ribbons. Maximum: One. Field installation: Yes. Specify: See "Print Belt Character Set" under "Specify" for ordering 48-, 64-, 96- or 128-character sets.

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3792 AUXILIARY CONTROL UNIT

Purpose: Provides for the attachment of up to four 3793 Keyboard-Printers, up to two communications lines for 2741 Communication Terminals, and as a feature, a line printer ... See "Special Features." The 3792 can be attached to the 3791 at a distance up to 2,000 feet.

Maximum: Three per 3791 Controller.

Highlights: Up to four 3793 Keyboard-Printers and up to two communications lines can be attached to the 3792 as a subcluster to the 3791. The 3792 attaches to the 3791 via Device Attachment Type I (#7900) on the 3791 at a distance up to 2,000 feet. Buffering, controlling, and checking of input and output data are provided.

Limitations: Only one 3792 Line Printer feature (#4712 or #4713) can be attached to a 3790 system. The one printer feature may be on any one of the three 3792 control units attachable to the 3791 controller. If Line Printer (#4712 or #4713) is installed, then the combined total of 2741 lines and 3793s cannot exceed four.

PREREQUISITE: A 3791 Controller equipped with Device Attachment Type I (#7900).

Communications Facilities: See M 2700 pages.

Modem: (3792/2741 Communications) IBM Leased Line Adapter (#5400) on the 3792.

Bibliography: CC20-0370

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Available at time of manufacture only. Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Color: Available at time of manufacture only. Specify #9041 for red, #9042 for yellow, or #9045 for gray.

[3] Print Belt Character Set: Specify for 3792 Line Printer (#4712 or #4713). These specific codes are available at time of manufacture only. See "Print Belt" in M 10000 pages if more than one print belt is required.

- #9071 -- 48 Character Belt Set, EBCDIC
- #9072 -- 64 Character Set, EBCDIC
- #9073 -- 96 Character Set, EBCDIC

Attachment position on the 3791: Specify #9100 for first 3792, #9120 for second 3792, and #9130 for third 3792.

<table>
<thead>
<tr>
<th>PRICES: Mdl</th>
<th>MAC/ MLC</th>
<th>Price</th>
<th>Purchase</th>
<th>MMC</th>
<th>MAC/ MLC</th>
<th>Price</th>
<th>Purchase</th>
<th>MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3792 1</td>
<td>$200</td>
<td>$170</td>
<td>$6,900</td>
<td>$34.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Plan Offering: Plan B Warranty: B Maintenance: D

Purchase Option: 55% Useful Life Category: 2 Per Call: 1 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

SPECIAL FEATURES

DEVICE ATTACHMENT FEATURES

LINE PRINTER - 80 PRINT POSITIONS 155 LPM MAX (#4712). Provides a line printer with maximum speeds of 155 LPM with 48 character set, 120 LPM with 64 character set, and 80 LPM with 96 character set included as standard is one operator inter-changeable print belt (48, 64, or 96 character set). Capability to print on continuous fan fold paper up to 80 print positions on an 8-inch (20 cm) print line. 6 lines per inch (2.54 cm). Paper up to six parts plus carbon (maximum total thickness is .020 inches or .50 mm) can be accommodated. Maximum paper width is 15" overall. Card stock is not recommended. A form jam detection capability is provided. Order IBM Part No. 1136634 or equivalent, for replacement ribbons. Maximum: One. Limitations: Line printers on the 3791 and 3792 must have the same number print positions. Field Installation: Yes. Specify: See "Print Belt Character Set" under Specify for ordering 48, 64 or 96 character sets.

LINE PRINTER - 132 PRINT POSITIONS 155 LPM MAX (#4713). Provides a line printer with maximum speeds of 155 LPM with 48 character set, 120 LPM with 64 character set, and 80 LPM with 96 character set. Included as standard is one operator inter-changeable print belt (48, 64 or 96 character set). Capability to print on continuous fan fold paper up to 132 print positions on a 15-inch (38.1 cm) print line. 6 lines per inch (2.54 cm). Paper up to six parts plus carbon (maximum total thickness is .020 inches or .50 mm) can be accommodated. Card stock is not recommended. A form jam detection capability is provided. Order IBM Part No. 1136634 or equivalent, for replacement ribbons. Maximum: One. Limitations: Line printers on the 3791 and 3792 must have the same number print positions. Field Installation: Yes. Specify: See "Print Belt Character Set" under Specify for ordering 48, 64 or 96 character sets.

PRINT BELT CHARACTER SET under Specify for ordering 48, 64 or 96 character sets.

3793 Attachment (#7901). To attach one 3793 Keyboard-Printer to the 3792 .. see 3793 for details. Maximum: Four.

Limitation: If a Line Printer (#4712, #4713 on the 3792) is installed, then the combined total of 2741s and 3793s cannot exceed four. Field Installation: Yes.

Control Storage Features: Whether additional control storage is to be ordered is dependent on both the quantities and types of attachments in the 3790 system configuration. See "IBM 3790 Communication System Configuration." G527-2768-6, for details.


COMMUNICATIONS FEATURES:

ADAPTER BASE (#1021). Provides for the installation of up to two Asynchronous Communications Controls (#1081). Maximum: One. Field Installation: Yes.

ASYNCHRONOUS COMMUNICATIONS CONTROL (#1081). Provides for the installation of an EIA Interface (#3701) for external modems, or an IBM Leased Line Adapter (#5400) for communications with a 2741. Maximum: Two. Field Installation: Yes. Prerequisite: Adapter Base (#1021).

EIA INTERFACE (#3701). Provides an EIA interface for the attachment of an IBM or other external modem. Maximum: Two.

Specify: #9003 for first #3701 feature; #9004 for second feature.* Field Installation: Yes. Prerequisites: Asynchronous Communications Control (#1081). The 3792 Communications Support required on the 3791 should specify whether External Modem attached to the 3792 will or will not have auto-answer. See "3792 Communications Support" under "Specify" on 3791 page.

IBM LEASED LINE ADAPTER (#5400). Provides a modem for communications with 2741 terminals via point-to-point non-switched communications lines. Specify: #9551 for 4-wire strapping (if receive interrupt feature is used by the 2741, 4-wire strapping is required); or #9662 for 2-wire strapping ... #9001 for first #5400 feature, #9002 for second #5400 feature.* Field Installation: Yes. Maximum: Two. Prerequisite: Asynchronous Communications Control (#1081).

* NOTE: Specify codes #9001 (1st #5400) and #9004 (2nd #3701) are mutually exclusive. Specify codes #9002 (2nd #5400) and #9003 (1st #3701) are mutually exclusive.

SECURITY KEYLOCK (#6350). Allows the 3792 to operate only when the key is in place ... removing the key causes operation to stop. For additional or replacement keys, see M 10000 pages. Maximum: One. Field Installation: Yes.

PLAN OFFERING: Plan A offering is available at the following prices:

<table>
<thead>
<tr>
<th>MAC/ MLC</th>
<th>Price</th>
<th>Purchase</th>
<th>MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1021</td>
<td>$49</td>
<td>$42</td>
<td>$1,700</td>
</tr>
<tr>
<td>1081</td>
<td>19</td>
<td>16</td>
<td>650</td>
</tr>
<tr>
<td>1622</td>
<td>32</td>
<td>27</td>
<td>637</td>
</tr>
<tr>
<td>1623</td>
<td>32</td>
<td>27</td>
<td>637</td>
</tr>
<tr>
<td>2701</td>
<td>12</td>
<td>10</td>
<td>400</td>
</tr>
<tr>
<td>5400</td>
<td>19</td>
<td>16</td>
<td>650</td>
</tr>
<tr>
<td>6350</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
</tbody>
</table>

FORMS STAND (#4450) -- Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing.

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3793 KEYBOARD-PRINTER

Purpose: Printed hard-copy and key data-entry facilities for attachment to a 3791 Controller or a 3792 Auxiliary Control Unit.

Highlights: A modified Selectric II typewriter terminal oriented to the functions of the 3790 system.

- Keyboard: Includes an EBCDIC keyboard with operator guidance lights and switches.
- Printer: A 15.5 cps printer (6 lines/inch) with friction-feed platen or, optionally, pin-feed platen. A Courier 72 print element (Part No. 1167043) is supplied. 3790 programs can provide vertical forms movement and automatic print element positioning.

The 3793 can be located up to 48 feet from the 3791 or 3792, with the customer responsible for the connecting cable. See the installation planning manual for details.

PREREQUISITE: One 3793 Attachment (#7901, 7902 or 7903) on a 3791 or 3792 per 3793.

Bibliography: GC20-0370

SPECIFY: Voltage (115 VAC, 1-phase, 60 Hz): #9881 for non-lock plug.

PRICES: Mdl MRC 2 yr Purchase MMMC

| 3793 | 1 | $119 | $101 | $3,450 | $28 |

Plan Offering: Plan B Warranty: B Maintenance: D Purchase Option: 55% Useful Life Category: 2 Per Call: 1 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

SPECIAL FEATURES

POWER LINE KEYLOCK (#5560). A key-operated switch in the power cord. When switch is in the off position, no action is possible at the 3793. Two keys are supplied with the feature. See M 10000 pages for additional or replacement keys. Maximum: One. Field Installation: Yes.

SPECIAL FEATURE PRICES:

| 5560 | $75 $5 SUC | $75 NC |

Accessories: The following item is available on a purchase only basis. For shipment with machine, order the feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

PIN FEED PLATEN (#9509) -- in lieu of standard friction feed platen. Maximum: One. See M 10000 pages for available options and additional #s to be specified.
IBM 3800 PRINTING SUBSYSTEM

Purpose: Printer output unit for 5/370 models 145, 145-3, 148, 155 II, 158, 165 II, 168 and a 3031, 3032, 3033, 4331 or 4341 Processor. A special feature allows data input from magnetic tape without printer output unit attachment to a system.

Highlights: Prints on single part continuous forms providing 50 discrete paper sizes... printing is repeated for multiple copies... every copy is “original” quality.

Print Speed Range:

<table>
<thead>
<tr>
<th>Forms</th>
<th>Forms in Lines Per Minute*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>Per Min</td>
</tr>
<tr>
<td>Up To</td>
<td>Up To</td>
</tr>
<tr>
<td>3-1/2</td>
<td>526</td>
</tr>
<tr>
<td>5-1/2</td>
<td>334</td>
</tr>
<tr>
<td>8-1/2</td>
<td>215</td>
</tr>
<tr>
<td>11</td>
<td>167</td>
</tr>
</tbody>
</table>

*Single copy copy speeds.

Printer job throughput can vary depending on form length, number of copies needed, and functions exercised.

52K byte storage standard for page buffering and control of printer operations... 42K when operated without system attachment.

Pitches – 10, 12 and 15 character per inch (CPI) standard... Print line maximum of 136 positions at 10 CPI, 163 positions at 12 CPI, and 204 positions at 15 CPI... 10, 12 and 15 CPI can be intermixed within page or line... vertical line spacing of 6, 8 and 12 line inches... intermixed line spacing within page.

Character Sets Standard

<table>
<thead>
<tr>
<th>Character</th>
<th>Pitch (CPI)</th>
<th>Style</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gothic 10</td>
<td>12 15</td>
<td>Undercaried</td>
<td></td>
</tr>
<tr>
<td>Gothic 15</td>
<td>Condensed</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Text 1 (Upper Case)</td>
<td>X</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Text 2 (Lower Case)</td>
<td>X</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>OCR A</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OCR B</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Katakana</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Includes World Trade National Use Graphics.

Character sets are organized in blocks of up to 64 characters and are held in subsystem read only storage.

Electronic character generation using Writable Character Generation Storage – 128 Writable Character Generation Storage positions are standard and organized in two 64 character Writable Character Generation Storage Modules (WCGM)... character sets are processed... loaded into WCGMs... when operating offline under control of Tape-to-Printing Subsystem (#7810), character sets are loaded into WCGMs by the operator through the operator panel, or by the 3800 control file tape which is an output of the Utility Program Product, 5748 UT2. Customer-designed characters require use of the Utility Program... an additional increment of 127 Writable Character Generation Storage Positions is optional, providing dynamic storage for printing 4 character styles and/or pitches within one data set... this represents up to 255 graphics online with no throughput loss... dynamic storage allows character substitution under program control... a customer may design his own characters. When operating under control of Feature #7810, customer-designed characters require use of Utility Program Product 5748 UT2.

Gothic 15 (15 characters/inch at 8 lines/inch) – 11" x 14-7/8" reports can be reduced to 8-1/2" x 11"... convenient size...

Optical Character Recognition (OCR) Printing – alphanumeric OCR A and the less styled OCR B fonts can be intermixed with non-OCR fonts with no reduction in printing throughput... documents may be processed by the 1287, 1288, 3762 and 3886 Optical Character Readers. Refer to the appropriate sales manual pages for specific capabilities.

Note: The OCR characters are designed to be representative of (but not always identical to) the mean character (shape) center line described in the “United States of America Standard Character Set for Optical Character Recognition, Size A, USAS X3.17-1966” for OCR-A font (also referred to as ANSI SC-LH) and the “European Computer Manufacturers Association’s Standard ECMA-11 for Alphanumeric Character Set OCR-B for Optical Recognition 2nd Edition, November 1971” for OCR-B.

Text Character Set – upper and lower case characters, seriffed design... special graphics... no reduction in throughput.

Format 10, 12 and 15 Pitch – merge format and data... program controlled for online operation, for offline operation with Feature (#7810) format character sets require Utility Program Product, 5748 UT2.

Copy Modification Function – identify copies with legends, phrases, or names (e.g., Customer Copy, For Accounting Purposes Only, etc.)... address each report copy to speed distribution... data format and program controlled. When operating under control of Feature (#7810), overlay is invoked from the operators panel or by the Utility Program Product, 5748 UT2.

Single Part Continuous Form Output – including custom printed forms... no deleting... no carbon disposal... faster turnaround... program control of copy quality... up to 255 copies... job separation marking use Mark Form function.

Optional Burst-Trimmer-Stacker Output – eliminates burst/deleaver bottleneck... offset separation between data set copies – remove output while printing... first-in, first-out job sequence... trimmed edges.

Optional Channel Switching – manual switches provide system configuration flexibility through the use of the 2914 Manual Switch, Model 1 (RPQ), or the Two Channel Switch (#8171) for two processors in a tightly coupled multiprocesing configuration... and two channels on a single CPU providing alternate path capability.

Laser Safety – the 3800 contains a laser assembly. The 3800, including the laser assembly, is designed to comply with the safety standards proposed by the United States Department of Health, Education and Welfare (Proposed Performance Standard for Laser Products, September 4, 1974 - Class I, 21 CFR 1040).

Limitations: Prints on discrete form sizes. Utilizes five form depths: 3-1/2", 5-1/2", 7", 8-1/2" and 11"... ten forms widths measured edge to edge: 6-1/2", 8-1/2", 9-1/2", 9-7/8", 10-5/8", 11", 12", 13-5/8", 14.3", 14-7/8" which permutes to 50 discrete sizes. Forms are refolded in 7" (2 x 3-1/2), 8-1/2" and 11" (2 x 5-1/2) in lengths.

Character and forms overlay printing restricted from first and last 1/2" of forms length. A printed line can begin a minimum of 0.5 inch from the left paper edge and cannot exceed a length to position a character nearer than 0.5 inches from the right paper edge for all widths except 14-7/8" where the stated dimension is 0.75 inches from the right edge. Paper must be from 15 lb to 24 lb basis weight. See GA26-1833 for details of weight and other forms considerations. Left-hand side of form is a fixed location in the machine, print line adjustment by electronics is not available on the line. First print position can move to the right 5.7 inches but will cause an equivalent number of positions at the right end to be moved beyond the above defined print line boundaries.

It is recommended that printing not occur within 0.100 inches of any binder holes or corner cuts within the form.

PREREQUISITE: A control unit position on a system channel and/or Tape-to-Printing Subsystem Feature (#7810).

S/370 mdi 145 (excluding 3145-3) – byte multiplexer channel (standard), Selector Channels (first one is standard), Block Multiplexer Channels (special features)... see 3145. Attachment to the byte multiplexer channel is not recommended. Selector channel attachment is not recommended unless dedicated.

S/370 mdi 145-3, 148 – byte multiplexer channel (standard), block multiplexer channel attachment... see 3145-3, 3148. Attachment to the byte multiplexer channel is not recommended.

S/370 mdi 155 II, 158 – byte multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature), Block Multiplexer Channels (first two are standard) ... see 3155, 3156, 3156-3.

S/370 mdi 165 II, 168 – selector channel of 2860, basic multiplexer channel of 2870, Selector Subchannel (special feature) of 2870, shared or non-shared subchannel of 2880 ... see 2860, 2870, 2880. Selector channel attachment is not recommended unless dedicated.

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3800 Printing Subsystem (cont’d)

3031 or 3032 Processor -- byte multiplexer channel (one is standard), block multiplexer channels (five are standard) ... see 3031 or 3032.

3033 Processor -- byte multiplexer channels (two are standard), block multiplexer channels (ten are standard) ... see 3033. See 4331 Processor -- byte multiplexer channel (special feature), block multiplexer channel (special feature) ... see 4331. Note: Attachment to the byte multiplexer channel is not recommended.

4331 Processor -- byte multiplexer channel (special feature), block multiplexer channel (special feature) ... see 4331. Note: Attachment to the byte multiplexer channel is not recommended.

Tape-to-Printing Subsystem (#7810) -- in lieu of or in addition to system channel attachments above ... see “Special Features.”

Bibliography: GC20-0001, GA26-1653, GA26-1654

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: Machine color is white, specify and cover color -- #9041 for red, #9042 for yellow, #9043 for blue, or #9045 for gray.


For rental customer -- specify #9220 for the first 3800 ordered for a customer. If required for a multiple machine installation, because of physical machine locations, an additional tool kit(s) is available.

For purchase customer -- specify #9330 on each 3800 machine ordered. When installed 3800s are purchased, a tool kit is to be ordered on a no-charge for each machine. Note: A Tool Kit (#9220) is required with Burster-Trimmer-Stacker (#1490) ... see #1490 below.

PRICES: 3800 Printing Plan

Basic Monthly BETP/ Charge/ MLC Use Charge
Rental Mdl MRC 2 Yr Rate
1 $7,708 $5,560 2.5 mills/foot

Purchase Price

Basic Monthly Maintenance Charge Rate
$325,500 $ 489

Plan Offering: Plan C (Monthly Use Plan) Warranty: B

Purchase Option: 50% (not applicable to Monthly Use Charges)

Maintenance: Available 24 hours per day, 7 days a week.

Per Cat: 3 Useful Life Category: 2 Upper Limit Percent: 0 Termination Charge: 5 Termination Percent: 25%

Educational Allowance: 10% (Does not apply to Monthly Use Charge Rate)

SPECIAL FEATURES

BURSTER-TRIMMER-STACKER (#1490). Provides an additional output stacking mode. Bursts the five forms lengths to individual sheets and stacks sheets sequentially. Also trims left and right 0.5 inches carrier strip from output sheet. Maximum: One. Field Selection: Yes. Prerequisite: One tool kit #9220 is required for CE maintenance. Contact the account Field Manager for requirements.

For rental customer -- specify #9220 for first Burster-Trimmer-Stacker feature ordered for a customer. If required for a multiple machine installation because of physical machine locations, an additional tool kit(s) is available on a no-charge MES. For purchase customer -- specify #9220 on each Burster-Trimmer-Stacker feature ordered. When installed Burster-Trimmer-Stackers are purchased, a tool kit is to be ordered on a no-charge for each feature.


REMOTE SWITCH ATTACHMENT (#5418). To attach the Two Channel Switch (#370) to a configuration control panel. Maximum: One. Field Installation: Yes. Prerequisite: Two Channel Switch (#8170).

TAPE-TO-PRINTING SUBSYSTEM FEATURE (#7810). Allows the 3800 to be operated from magnetic tape data. Either 3411/3412 or 3803/3420 tape systems can be used. May be operated either offline under operator control or online. Up to eight tape control units may be attached provided that power sequencing and control connection for all other than one are provided by a system; and provided that all 3803 control units have at least one path, which may be switchable, to a S/380, S/370, or 4300 Processor. This feature will accept the non-IBM system print tape formats described below.

Burroughs: B7000/B6000 Series System Software Operational Guide, Volume 1 (Form #5001583), Section 1 (Backup).

Tape Files must be 7 or 9 track, EBCDIC coding, and ANSI (USASI) standard tape labels and data formats. For further details refer the customer to B7000/B6000 series I/O System Reference Manual (Form #5001779).

For definition of the line printer control words, refer the customer to Burroughs B6700 Handbook (Form #5000276).

Honeywell: Series 60 (level 66/6000) Bulk Media Conversion program formats and Standard System formats that have the following characteristics:

- Variable length records
- Binary or BCD mode
- 7 or 9 track
- Standard labeled or non-labeled
- Low or high density
- Standard printer commands with or without edit characters

For further details refer the customer to the following Honeywell publications:

DD11 Bulk Media Conversion
DD07 File and Record Control

Symbiont printer tape. For further details refer the customer to:

Symbiont Univel 110 Series Executive System Volume 2 EXEC (Form #4144.2). Limitations: Selection of the non-IBM system tape format to be used must be made by the operator before printing.

Where more than one print character is represented by one 8-bit byte (data packing) on the non-IBM system print tape, applications using character densities above 8160 characters per 11 inch page may impact 3800 overall throughput and must be evaluated.

When using non-IBM system print tape formats, control tapes produced by IBM 3800 Tape-to-Printing Subsystem Feature Utility (Program Product 5745-UT2) are supported only with an IBM record format of VBM (variable length block machine language) with standard IBM labels or no labels.

Maximum: One. Field Installation: Yes.

TWO CHANNEL SWITCH (#8170). To attach the 3800 to two S/370 or 4300 Processor channels which may be on the same CPU or on two different CPUs. Both interfaces must have the same device address. The two channel switch will allow operation on only one channel at a time. Selection of the channel which is to be operable is by means of manual switches on the control panel. Maximum: One. Field Installation: Yes.

DYNAMIC TWO CHANNEL SWITCH (#8171). Provides the additional capability of an automatic two channel switch. The switch is designed to furnish symmetric two processor support for tightly coupled multiprocessor systems and to attach to two channels from a single CPU to provide alternate path capability. For either tightly coupled multiprocessors or single CPU attachments, data transfer occurs only one channel at a time. Maximum: One. Field Installation: Yes. Prerequisite: Two Channel Switch (#8170).

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IBM 3803 TAPE CONTROL - MODEL 1

Purpose: Control unit for 3420 Magnetic Tape Units mdls 3, 5 and 7.

Highlights: Single channel control for up to eight 3420 tape units. Through special switching features, up to sixteen tape drives can be addressed through any of four 3803 control units. Features are offered to provide performance at 556 and 800 bpi in the seven track NRZI format or at 800 bpi in the nine track NRZI format or at 1600 bpi phase encoded.

The following table indicates feature numbers for corresponding functions:

<table>
<thead>
<tr>
<th>Subsystem Function</th>
<th>Feature Name</th>
<th>3420 Tape Unit</th>
<th>3803 Control Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1600 bpi PE 9-track only</td>
<td>Single Density</td>
<td>#6631</td>
<td>#9570</td>
</tr>
<tr>
<td>1600 bpi PE/800 bpi NRZI 9-track</td>
<td>Dual Density</td>
<td>#3550</td>
<td>#3551</td>
</tr>
<tr>
<td>1600 bpi PE/556-800 bpi NRZI 7-track</td>
<td>Seven Track</td>
<td>#6407*</td>
<td>#6408</td>
</tr>
</tbody>
</table>

* Tape unit will only read or write 7-track tape.

PREREQUISITES: A control unit position on a S/360, S/370 or 4300 Processor system channel or Tape-to-Taping Subsystem Function (7810) on a 3803 Processor Subsystem. When not used with a 3800 with feature #7810, at least one path, which may be switchable, must be provided to a S/360, S/370 or 4300 Processor. When multiple control units (up to 8 are allowable) are connected to a 3800, all other than one must have power sequencing and control connection provided by a system.

For S/360 mdk 30 -- if the 3803 is attached to the 2030 selector channel via an 1400 Magnetic Tape Compatibility Feature (4468), then 3420/1400 Compatibility (#9750) is required on the 2030 ... see "Specify" under 2030.


135: NoT supported on byte multiplexer channel for concurrent operation with Integrated File Adapter, Integrated Communications Adapter, or Selector Channel. Atachable to 4331, and 4341 Processor. For considerations see 4331 Channel Characteristics, GA33-1527. Note: A 3803 cannot be attached to the byte multiplexer channel on a 4341 Processor.

3420 mdls 4, 6 or 8 cannot be addressed through a 3803 md1. 1.

Bibliography: S-360 -- GC20-0006, S-370 -- GC20-0001

Specify: [1] Either Dual Density (#3551) or Seven Track (#6408) must be ordered unless Single Density (#9570) is specified. Only one of the three features can be installed.

1. Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 206 V, or 
   #9005 for 230 V ... must be consistent with system voltage.

2. Color: #9041 for red, #9042 for yellow, #9043 for blue, or 
   #9045 for gray, or #9046 for white.

4. If a tape switching configuration is being ordered, the 3803 must be equipped with a Communicator (#9071 or #9073) ... see table under "Tape Switching" below. If a Communicator feature is ordered for a 3803 without a switching feature, no tape units can be attached to that control unit.

FTP / ETP / MAC / MLC MLC MLC MLC PRICES Mdl MRC 1 yr*2 yr 2 yr Purchase MMMC 3803 1 $757 $696 $636 $536 $23,670 $109

Plan Offering: Plan A, Additional Use Charge Rate: 10% Metering: Assignable Unit Warranty: B Maintenance: A Purchase Option: 55% Useful Life Category: 2 Per Call: 3 Model/Feature Additional Charge in lieu of AU Charge: 10% Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0% * FTP is 12-23 months.

FTP / ETP / MLC ... all models of the 3803 may be under ETP/MPLC or ETP/MLC.

Model Changes: A 3803 md1 1 may be converted to a 3803 md1 2 in the field ... for Model Upgrade Price, see 3803 Tape Control md1 2.

SPECIAL FEATURES

Note: All special features for the 3803 are field installable.

DUAL DENSITY (#3551). Provides for the attachment of tape units equipped with Dual Density (#3550) to read and write tapes at either 1600 bpi PE or 800 bpi NRZI nine track. Tape units equipped with Single Density (#6631) can also be attached. Limitation: Dual Density (#3551) cannot be installed in the same control unit with either Single Density (#9570) or Seven Track (#6408).

REMOTE SWITCH ATTACHMENT (#6148). Provides for remote operation of the Two Channel Switch (#8100) on the 3803 md1 from a remote console such as the configuration control panel (3058 or 3068) for a S/370 md1 158 MP or 168 MP. Operation of the switch on the remote console will result in the operation of the 3803 switch. The 3803 switches will be functionally inoperative when this feature is installed. The cable to the remote console is not provided by this feature. The cable used must contain three wires for each Enable/Disable switch to be installed. Each line must have a total loop resistance of less than 75 ohms when the remote switch completes the path. For operation with the 2925 md1 10, 3058 or 3068, Table 153117 is required and should be ordered separate.

SEVEN TRACK (#6408). Provides for the attachment of tape units equipped with Seven Track (#6407) to read and write tapes at either 556 or 800 bpi in the 7-track format compatible with tapes written by 729, 7330, 7335 and 2400 series tape units equipped with 7-track read/write heads. Includes the translator function, which, when used, converts 8-bit bytes from the 1/0 inter face to be written on tape as 6-bit BCD characters and 6-bit BCD characters read from tape to be translated into their EBCDIC equivalents. The Data Conversion Function, also included, allows reading and writing of 8-bit bytes on 7-track tape by converting four tape characters into three storage bytes and vice versa. Tape units equipped with Single Density (#6631) can also be attached.

Limitation: Cannot be installed in the same control unit with either Single Density (#9570) or Dual Density (#3551).

TWO CHANNEL SWITCH (#8100). Permits connection of the 3803 Tape Control to a second channel. Alternate path switching between two channels on the same system is under program control. Partitioning of attached tape units between channels on two different systems can be done using current procedures for logical device partitioning. These procedures involve the proper use of the operator commands VARY ON/VARY OFF (OS) or DVCN/DVCP (DS). Note: When installed on the S/360 md1 30, the 3803 with #8100 is not supported under 1400 Magnetic Tape Compatibility (#4468), but is supported with the Programmed Mode Switch (#5656) when the tapes are operated in 360 mode under CS1400 program support.

TAPE SWITCHING: Switching configurations, via two, three or four control units, are available to provide access to:

(a) Up to eight tape units attached to a single control unit.
(b) Up to sixteen tape units, with eight attached to each of two control units.

All switchable tape units must be attached to the control units equipped with the switching features (2-Control Switch, 3-Control Switch or 4-Control Switch). Each control unit must be equipped with the appropriate Single Density, Dual Density or Seven Track feature for any drive in the pool to which it has access.

The table below indicates features required for the available switching options.

<table>
<thead>
<tr>
<th>Switching Options</th>
<th>Features Required</th>
<th>Feature Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On 1st 1803</td>
<td>On 2nd 1803</td>
</tr>
<tr>
<td>2 x 8</td>
<td>Communicator 1-2</td>
<td>9071</td>
</tr>
<tr>
<td></td>
<td>2-Control Switch</td>
<td>1792</td>
</tr>
<tr>
<td>3 x 8</td>
<td>Communicator 1-2</td>
<td>9071</td>
</tr>
<tr>
<td></td>
<td>3-Control Switch</td>
<td>1793</td>
</tr>
<tr>
<td>4 x 8</td>
<td>Communicator 1-2</td>
<td>9071</td>
</tr>
<tr>
<td></td>
<td>4-Control Switch</td>
<td>1794</td>
</tr>
<tr>
<td>2 x 16</td>
<td>Communicator 1-2</td>
<td>9071</td>
</tr>
<tr>
<td></td>
<td>2-Control Switch</td>
<td>1792</td>
</tr>
<tr>
<td>3 x 16</td>
<td>Communicator 3-4</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>3-Control Switch</td>
<td>1793</td>
</tr>
<tr>
<td>4 x 16</td>
<td>Communicator 3-4</td>
<td>--</td>
</tr>
<tr>
<td></td>
<td>4-Control Switch</td>
<td>1794</td>
</tr>
</tbody>
</table>

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### IBM 3803 TAPE CONTROL - MODEL 2

**Purpose:** Control unit for 3420 Magnetic Tape Units mlds 3 through 8.

#### Highlights:
- Standard control unit provides 6250 and 1600 bpi densities.
- 6250 Encoding/Checking Logic allows error correction on the fly for any single track or combinations of two tracks simultaneously.
- Errors may be corrected in all nine tracks of a single data block providing they occur in combinations of no more than two tracks at a time. Long tape blocks are subdivided by resync bursts which are inserted within the block to allow error tracks to return to full operation when reading forward, thereby restoring maximum error correction capability.
- Optional features provide 9-track (800 bpi) NRZI, or 9-track (800 bpi) NRZI with 7-track (800, 556, 200 bpi) NRZI formats.
- 9-track NRZI with 7-track NRZI features permit mixing 9 and 7-track tape units on the same 3803 mld 2.

The following table indicates features for corresponding functions:

<table>
<thead>
<tr>
<th>Tape Control</th>
<th>3420 Tape Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mdl-3,5,7 Mdl-4,6,8</td>
<td></td>
</tr>
</tbody>
</table>

**Tape Switching**
- 2-Cntrl Switch #1792 $223 $205 $187 $187 $7,020 $11.00
- 3-Cntrl Switch 1793 286 283 240 240 8,955 17.50
- 4-Cntrl Switch 1794 335 301 281 281 10,530 17.50
- Dual Data Swtch 3551 63 76 70 70 2,630 3.00
- Remote Sw Attac 6148 33 30 28 28 1,045 NC
- Seven Track 6406 63 76 70 70 2,630 3.00
- Two Channel Sw 8100 166 153 139 139 5,265 5.50

**Tape Switch Characteristics:**
- FTP is 12-23 months.

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Plan Offering: Plan A, Additional Use Charge Rate: 10% 
Metring: Assignable Unit Warranty: B 
Purchase Option: 55% Useful Life Category: 2 
Per Call: 3 
Model/Feature Additional Charge in lieu of AU Charge: 10% 
Termination Charge Months: 5 Termination Charge Percent: 25% 
Upper Limit Percent: 0%

* FTP is 12-23 months.

** Price quotations and customer order acknowledge­ment letters for Purchase must state: "Installation of this model change involves the removal of parts which become the property of IBM."

** Special Features

9 TRACK NRZI (#5310). Required for attachment of 3420 mdls 3, 5 or 7 equipped with Dual Density (#3550). Allows attached tape units to read and write data in 9-track - 800 bpi format as well as 1600 bpi (Phase Encoded) format. Installation: Yes.

REMOTE SWITCH ATTACHMENT (#6148). Provides for remote operation of the Two Channel Switch (#8100) on the 3803 mdl 2, from a remote console such as the configuration control panel (3068 or 306E) for a S/370 mld 158 MP or 168 MP. Operation of the switch on the remote console will result in the same function as operation of the 3803 switch. The 3803 switches will be functionally inoperative when this feature is installed. The cable to the remote console is not provided by this feature. The cable used must contain three wires for each Enable/Disable switch to be installed. Each line must have a total loop resistance of less than 75 ohms when the remote switch completes the path. For operation with the 2925 mld 10, 3058 or 3068, cable P/N 5351178 is required and should be ordered - separate Field Installation: Yes.

7 TRACK NRZI (#6320). Required for attachment of 3420 mdls 3, 5 or 7 equipped with Seven Track (#6407). Allows attached tape units to read and write data in 7-track/200, 556 or 800 bpi format. Installation: Yes. Prerequisite: 9 Track NRZI (#5310).

TWO CHANNEL SWITCH (#6100). Permits connection of the 3803 to a second channel. Alternate path switching between two channels on the same system is under program control. Partitioning of attached tape units between channels on two different systems can be done using current procedures for local device partitioning. The procedures involve the proper use of the operator commands VARY ONLINE/VARY OFFLINE (OS) or DVCDDN/DVCUP (DOS).

TAPE SWITCHING (#1792 - 1794). Switching configurations, via two, three or four control units, are available to provide access to:

(a) Up to eight tape units attached to a single control unit.
(b) Up to sixteen tape units, with eight attached to each of two control units.

All switchable tape units must be signal attached to the control units equipped with the switching features (2-Control Switch, 3-Control Switch, or 4-Control Switch). Each control unit must be equipped with appropriate density feature for any drive in the pool to which it has access. Field Installation: Yes.

* The table below indicates features required for the available switching options.

<table>
<thead>
<tr>
<th>Switching Options</th>
<th>Features Required</th>
<th>Feature Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>On 1st 3803</td>
<td>On 2nd 3803</td>
<td>On 3rd 3803</td>
</tr>
<tr>
<td>Communicator 1-2</td>
<td>9071</td>
<td>9071</td>
</tr>
<tr>
<td>2-Control Switch</td>
<td>1792</td>
<td>--</td>
</tr>
<tr>
<td>Communicator 1-2</td>
<td>9071</td>
<td>9071</td>
</tr>
<tr>
<td>3-Control Switch</td>
<td>1793</td>
<td>--</td>
</tr>
<tr>
<td>Communicator 1-2</td>
<td>9071</td>
<td>9071</td>
</tr>
<tr>
<td>4-Control Switch</td>
<td>1794</td>
<td>--</td>
</tr>
<tr>
<td>Communicator 1-2</td>
<td>9071</td>
<td>9071</td>
</tr>
<tr>
<td>2 x 8</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>3 x 8</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>4 x 8</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>2 x 16</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>3 x 16</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>4 x 16</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Communicator 3-4</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>4-Control Switch</td>
<td>1794</td>
<td>1794</td>
</tr>
</tbody>
</table>

* FTP is 12-23 months.

** PREREQUISITES: The Magnetic Tape Adapter feature (#4675) and Specify feature (#9807) on S/370 mld 115 or 125.

LIMITATIONS: Attachable to S/370 mld 115 and 125, 3420 mdls 4, 6, 7 or 8 cannot be addressed through a 3803 mld 3.

** Bibliography: GC20-0001.

** SPECIFY: [1] Either Dual Density (3551) or Seven Track (#6408) must be ordered unless Single Density (#9570) is specified. Only one of the three features can be installed.

** Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V must be consistent with system voltage.

** Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

** FT/FTP/ETP/MLC: ETP, FTP and MLC are optionally available. Customers can transfer to ETP/MLC when the two year ETP/MLC commitment period begins at the date of installation charges.

FTP/ETP/FTP or MAC/MLC/MLC FTP/ETP/MLC/MLC

FP/P/FTP: Tape Switching

Plan Offering: Plan A, Additional Use Charge Rate: 10%

** Metering: Assignable Unit Warranty: B 

Purchase Option: 55% Useful Life Category: 2 Per Call: 3 

Model/Feature Additional Charge in lieu of AU Charge: 10% 

Termination Charge Months: 5 Termination Charge Percent: 25% 

Upper Limit Percent: 0%

* FTP is 12-23 months.

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3803 Tape Control Model 3 (cont'd)

**DUAL DENSITY (#3551).** Provides for the attachment of tape units equipped with Dual Density (#3550) to read and write tapes at either 1560 bpi PE or 800 bpi NR2/4 track. Tape units equipped with Single Density (#6631) can also be attached. **Limitation:** Dual Density (#3551) cannot be installed in the same control unit with either Single Density (#9570) or Seven Track (#6408). Field Installation: Yes.

**SEVEN TRACK (#6408).** Provides for the attachment of tape units equipped with Seven Track (#6407) to read and write tapes at either 558- or 800-bpi in the 7-track format compatible with tapes written by 729, 7330, 7335 and 2400 series tape units equipped with 7-track read/write heads. Includes the translator function, which, when used, causes 8-bit bytes from the I/O interface to be written on tape as 6-bit BCD characters and 6-bit BCD characters read from tape to be translated into their EBCDIC equivalents. The Data Conversion function, also included, allows reading and writing of 8-bit bytes on 7-track tape by converting four tape characters into three storage bytes and vice versa. Tape units equipped with Single Density (#9631) can also be attached. **Limitation:** Cannot be installed in the same control unit with either Single Density (#9570) or Dual Density (#3551). Field Installation: Yes.

**IB M 3811 PRINTER CONTROL UNIT**

**Purpose:** Control unit for the 3211 Printer in a S/360 mdl 22, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195 or any S/370 Processor (except 3150 or 3250) and any 3600 Processor.

**Highlights:** The 3811 provides the necessary controls for attaching the 3211 Printer to the I/O channels provided by the processing system. It contains all the necessary electronic controls and buffering to adapt the mechanical printer to the channel. The control unit (3811) and the mechanical printer (3211) are physically attached to each other.

The logic, buffers and controls of the Universal Character Set and Forms Control Buffer are located in the 3811.

**PREREQUISITES:** The 3811 requires a control unit position on a system channel.

S/360 mdl 22, 30, 40, 50, 65, 67 (multiple selector channel) ... also models of the 3803 may be under ETP/MLC or FTP/MLC.

Model Changes: A 3803 mdl 3 may be converted to a 3803 mdl 3 in the field. Field conversion of a 3803 mdl 2 to a 3803 mdl 3 or a 3803 mdl 3 to a 3803 mdl 2 is not available. On field converting a purchased 3803 mdl 3, a 3803 model 3, features #9071, #9072, #1787, #1793, #1794, #6148 and #8100 if installed on the 3803 mdl 1 must be removed at customer's expense.

**MODEL UPGRADE PURCHASE PRICE** (there are no additional installation charges).

Model 1 to Model 3 ...... $8,900

**DUAL DENSITY (#3551).** Provides for the attachment of tape units equipped with Dual Density (#3550) to read and write tapes at either 1560 bpi PE or 800 bpi NR2/4 track. Tape units equipped with Single Density (#6631) can also be attached. **Limitation:** Dual Density (#3551) cannot be installed in the same control unit with either Single Density (#9570) or Seven Track (#6408). Field Installation: Yes.

**SEVEN TRACK (#6408).** Provides for the attachment of tape units equipped with Seven Track (#6407) to read and write tapes at either 558- or 800-bpi in the 7-track format compatible with tapes written by 729, 7330, 7335 and 2400 series tape units equipped with 7-track read/write heads. Includes the translator function, which, when used, causes 8-bit bytes from the I/O interface to be written on tape as 6-bit BCD characters and 6-bit BCD characters read from tape to be translated into their EBCDIC equivalents. The Data Conversion function, also included, allows reading and writing of 8-bit bytes on 7-track tape by converting four tape characters into three storage bytes and vice versa. Tape units equipped with Single Density (#9631) can also be attached. **Limitation:** Cannot be installed in the same control unit with either Single Density (#9570) or Dual Density (#3551). Field Installation: Yes.

**FTP / ETP / MAC / MLC**

**Special Feature Prices:** MRC 1 yr* 2 yr Purchase MMMC

Dual Density #3551 83 $ 76 $ 70 $ 70 $ 2,630 $3.00

Seven Track 6408 83 76 70 70 2,630 3.00

* FTP is 12-23 months.

**IBM 3811 PRINTER CONTROL UNIT**

**Purpose:** Control unit for the 3211 Printer in a S/360 mdl 22, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195 or any S/370 Processor (except 3150 or 3250) and any 3600 Processor.

**Highlights:** The 3811 provides the necessary controls for attaching the 3211 Printer to the I/O channels provided by the processing system. It contains all the necessary electronic controls and buffering to adapt the mechanical printer to the channel. The control unit (3811) and the mechanical printer (3211) are physically attached to each other.

The logic, buffers and controls of the Universal Character Set and Forms Control Buffer are located in the 3811.

**PREREQUISITES:** The 3811 requires a control unit position on a system channel.

S/360 mdl 22, 30, 40, 50, 65, 67 (multiple selector channel) ... also models of the 3803 may be under ETP/MLC or FTP/MLC.

Model Changes: A 3803 mdl 1 may be converted to a 3803 mdl 3 in the field. Field conversion of a 3803 mdl 2 to a 3803 mdl 3 or a 3803 mdl 3 to a 3803 mdl 2 is not available. On field converting a purchased 3803 mdl 3, a 3803 model 3, features #9071, #9072, #1787, #1793, #1794, #6148 and #8100 if installed on the 3803 mdl 1 must be removed at customer's expense.

**MODEL UPGRADE PURCHASE PRICE** (there are no additional installation charges).

Model 1 to Model 3 ...... $8,900

**DUAL DENSITY (#3551).** Provides for the attachment of tape units equipped with Dual Density (#3550) to read and write tapes at either 1560 bpi PE or 800 bpi NR2/4 track. Tape units equipped with Single Density (#6631) can also be attached. **Limitation:** Dual Density (#3551) cannot be installed in the same control unit with either Single Density (#9570) or Seven Track (#6408). Field Installation: Yes.

**SEVEN TRACK (#6408).** Provides for the attachment of tape units equipped with Seven Track (#6407) to read and write tapes at either 558- or 800-bpi in the 7-track format compatible with tapes written by 729, 7330, 7335 and 2400 series tape units equipped with 7-track read/write heads. Includes the translator function, which, when used, causes 8-bit bytes from the I/O interface to be written on tape as 6-bit BCD characters and 6-bit BCD characters read from tape to be translated into their EBCDIC equivalents. The Data Conversion function, also included, allows reading and writing of 8-bit bytes on 7-track tape by converting four tape characters into three storage bytes and vice versa. Tape units equipped with Single Density (#9631) can also be attached. **Limitation:** Cannot be installed in the same control unit with either Single Density (#9570) or Dual Density (#3551). Field Installation: Yes.

**FTP / ETP / MAC / MLC**

**Special Feature Prices:** MRC 1 yr* 2 yr Purchase MMMC

Dual Density #3551 $ 83 $ 76 $ 70 $ 70 $ 2,630 $3.00

Seven Track 6408 83 76 70 70 2,630 3.00

* FTP is 12-23 months.

**IB M 3811 PRINTER CONTROL UNIT**

**Purpose:** Control unit for the 3211 Printer in a S/360 mdl 22, 30, 40, 50, 65, 67 (in 65 mode), 75, 85, 195 or any S/370 Processor (except 3150 or 3250) and any 3600 Processor.

**Highlights:** The 3811 provides the necessary controls for attaching the 3211 Printer to the I/O channels provided by the processing system. It contains all the necessary electronic controls and buffering to adapt the mechanical printer to the channel. The control unit (3811) and the mechanical printer (3211) are physically attached to each other.

The logic, buffers and controls of the Universal Character Set and Forms Control Buffer are located in the 3811.

**PREREQUISITES:** The 3811 requires a control unit position on a system channel.

S/360 mdl 22, 30, 40, 50, 65, 67 (multiple selector channel) ... also models of the 3803 may be under ETP/MLC or FTP/MLC.

Model Changes: A 3803 mdl 1 may be converted to a 3803 mdl 3 in the field. Field conversion of a 3803 mdl 2 to a 3803 mdl 3 or a 3803 mdl 3 to a 3803 mdl 2 is not available. On field converting a purchased 3803 mdl 3, a 3803 model 3, features #9071, #9072, #1787, #1793, #1794, #6148 and #8100 if installed on the 3803 mdl 1 must be removed at customer's expense.
IBM 3830 STORAGE CONTROL

Purpose: Control unit for 3330, 3333, 3340, 3344 or 3350 disk storage.

Model 1: Provides for attachment of up to four 3330 modules in any combination of modules 1 and/or 2. Attaches to S/370 model 195 or S/370 model 165, 168 or 195 via a 2860 Block Multiplexer Channel. Attachment to the S/370 model 135 or 145 is made via the system block multiplexer channel or selector channel and to the 135-3, 138, 145-3 and 148 via the block multiplexer channel. Attachment to S/370 model 155 or 158 is made via the system's block multiplexer channel. Attachment to a 3031, 3032, 3033 or 4341 Processor is made via a block multiplexer channel.

Model 2: Provides for the attachment of 3333a (mdls 1 and/or 2) and/or 3340 mdls A2 and/or 3350 mdls A2s/A2Fs ... see DASD Configuration under "Specify." Additional storage is provided by attaching 3340 mdls B5 and/or 3344s to the 3340 mdl A2 or by attaching 3350 mdls B5 and/or a C5 to the 3350 mdls C5. DASD Configuration under "Specify" and 3330, 3333, 3340, 3344, 3350 "Machines" pages.

Attaches to S/360 model 195 or S/370 model 165, 168 or 195 via a 2860 Block Multiplexer Channel. Attachment to S/370 model 135 (see "Limitations") or 145 is made via the system's block multiplexer channel or selector channel and to the 135-3, 138, 145-3 and 148 via the block multiplexer channel. Attachment to S/370 model 155 or 158 is made via the system's block multiplexer channel. Attachment to a 3031, 3032, 3033 or 4341 Processor is made via a block multiplexer channel.

Highlights: File organization and format are under program control. Command chaining permits flexible and efficient processing of either randomly or sequentially organized files. Data integrity is provided through extensive error detection and correction capabilities.

Standard Features: Include the following:

Command Chaining – allows sequential records within a cylinder to be read/written by a sequence of channel commands without rotational delays between records.

Record Overflow – storage efficiency is obtained by allowing records to span track boundaries within a cylinder.

PREREQUISITES: [1] The 3830 mdl 1 is designed for interconnected operation with 3330 Disk Storage. Customers who wish to order a 3830 mdl 1 for stand-alone or individual use should submit an RPO to provide the necessary safety elements (covers, cable connectors, etc.) to complete the unit for a non-standard (i.e., not interconnected as part of a 3330 facility) environment. In lieu of the RPO, the customer may provide safety elements equivalent to the standard 3330-1/3330 configuration or that provided by the RPO. If not provided, the unit will be offered on a purchase only basis. See Item [5] under "Specify." Agreement for IBM to install and maintain the 3830 mdl 1 in any non-standard environment must be reviewed.

[2] An available control unit position on a channel. One unshared subchannel for each drive attached on a system block multiplexer channel or a 2860 Block Multiplexer Channel. For S/370 models 135 and 145, a system block multiplexer channel is required for support of block multiplexing and rotational position sensing ... see 3333, 3330, 3340, 3344, 3350. If this support is not required, attachment to a system selector channel is permitted.

Limitations: [1] See 3333, 3330, 3340, 3344 and 3350 for system support limitations ... [2] In S/370 model 135, 135-3, 138, when a 3830 mdl 2 is attached to a block multiplexer channel, 8 logical devices will operate in this mode even if more than 16 logical devices are attached.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with 3300, 3330 or 3340 voltage.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
[3] Non-standard Environment: #9485 ... must be specified if the 3830 mdl 1 is not to be installed as part of a 3330 facility. Also see "Prerequisites" above.

Notes:

1. ISD diskette-only specify feature. See note when ordered at time of manufacture or with chargeable feature that supplies diskette. $290 on purchased machines to include any number of diskette-only changes ordered on the same diskette.
2. Any change to an installed DASD Configuration requires a MES ONLY if the new configuration indicates that a different Specify and/or Special Feature(s) is required. The MES must include addition of any new Specify and/or Special Features not previously installed AND removal of any not listed as required for the new configuration.
3. Control Store Extension (#2150) is prerequisite. With #3151, the 3380 mdl 2 requires 32 contiguous device addresses regardless of the number of devices attached.
4. Control Store Extension (#2150) and Register Extension (#6111) are prerequisites. For configurations in this group the 3380-2 uses 64 contiguous device addresses irrespective of the number of drives attached. The 340 mdl A2s on the first and third strings may attach up to three 3340 mdl B1, B2, and/or 3344s in any combination. The 3340 mdl A2 on the second string may attach up to three 3340 mdl B1/B2. The 3340 mdl A2 on the fourth string may attach one 3340 mdl B1 or B2.
5. Expanded Control Store (#2151). Control Store Expansion (#2150) and Register Extension (#6111) are prerequisites. For configurations in this group the 3380-2 uses 8 or 16 or 32 or 64 device addresses depending upon the DASD configuration installed and whether any 3350 drive is in 3350-1 compatibility mode.

M 3830.1 May 79
### 3830 Storage Control (cont'd)

**3830 MODEL 2 WITH TWO CHANNEL SWITCH, ADD'L (#8171) AND ITS PREREQUISITE TWO CHANNEL SWITCH (#8170)**

<table>
<thead>
<tr>
<th>DASD Configuration</th>
<th>Required DASD Specify Features *</th>
</tr>
</thead>
<tbody>
<tr>
<td>One or two 333a with 333b, 333c</td>
<td>x x</td>
</tr>
<tr>
<td>One or two 3340 mdl A2 with associated 3340/3344</td>
<td>x x x</td>
</tr>
<tr>
<td>String Switch (#8150) on any channel</td>
<td>x</td>
</tr>
<tr>
<td>One or two 3340 mdl A2 with associated 3340/3344</td>
<td>x x</td>
</tr>
<tr>
<td>Up to four 3340 mdl A2/2 with associated 3340/3344</td>
<td>x x</td>
</tr>
<tr>
<td>String Switch (#8150) on any 3340 mdl A2</td>
<td>x</td>
</tr>
<tr>
<td>Up to four 3340 mdl A2 and 3340/3344</td>
<td>x x</td>
</tr>
</tbody>
</table>

**NOTE:** For explanation of *, ++, and **, see Table 3330 Model 2 with or Without Two Channel Switch (#8170)**

**3830 Storage Control**

<table>
<thead>
<tr>
<th>PLAN</th>
<th>Mdl</th>
<th>MAC/MLC</th>
<th>2 yr</th>
<th>CHG</th>
<th>PER CHG</th>
</tr>
</thead>
<tbody>
<tr>
<td>3830</td>
<td>1</td>
<td>2,055</td>
<td>N/A</td>
<td>56</td>
<td>270</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1,740</td>
<td>4,622</td>
<td>24</td>
<td>126</td>
</tr>
</tbody>
</table>

Plan Offering: Plan A, Additional Use Charge Rate: 10%

**Prices:** Mdl MAC/MLC 2 yr CHG Purchase MMMC

**REMOTE SWITCH ATTACHMENT, ADD'L (#6149).**

**Model 2 only** To attach the Two Channel Switch, Add'l (#8171) to a configuration control panel. Field Installation: Yes.

**TWO CHANNEL SWITCH (#8170).** To attach the 3830 to a second channel ... the two channels may be on the same Processor or different Processors. An available control unit position is required on each channel ... see item [2] under “Prerequisites.” Switching is under program control. The 3830 can be dedicated to a single channel by means of an Enable/Disable switch. Field Installation: Yes. Maximum: One.

**TWO CHANNEL SWITCH, ADD'L (#8171).** Adds switching for two additional channels to a 3830 with Two Channel Switch (#8170), providing four channel switch capability. Limitation: Only two channels of the four available can be attached to the same Processor. Cannot be installed if Fixed Head Feature (4310/4302) is installed on any 3340. Field Installation: Yes. Maximum: One. Prerequisites: Two Channel Switch (#8170), Expanded Control Store (#2151) and/or Control Store Extension (#2150) are also required in certain 3830 mdl 2 configurations ... see DASD Configuration under “Specify.”

---

*See supplier's price quotations and customer order acknowledgment letter for purchase.*

**IBM 3830 STORAGE CONTROL - Model 3**

**Purpose:** Provides for the attachment of 3333/3330/3350 DASD in a 3850 Mass Storage System.

**Highlights:**

- Virtual Disk Storage: provides up to 64 unique addresses for each channel interface.
- Channel Interfaces: up to three Processor channel interfaces are available, providing up to 192 unique addresses on each 3830 mdl 3.
- Drives: up to 32 DASD spindles of 3333/3330 Models 1, 2 and 11 and 3350 mdls A2/A2F, B2/B2F and C2/C2F can be attached. A 3830 mdl 3 with feature #9320 can operate any combination of up to four 3330 mdls 1 and 11 with associated 3330 mdls 1 and 2 and native 3350 mdls A2/A2F with associated native 3350 mdls B2/B2F and C2/C2F. A 3830 mdl 3 with feature #6250 can operate up to four 3350 mdls A2/A2F with associated 3350 mdls B2/B2F and C2/C2F in either native or 3350-11 mode. See 3333, 3330 and 3350 for additional information.
- Staging Drives: up to sixteen 3333 mdl 1/3330 mdl 1 or 2 storage devices can be designated as staging drives. 3333/3330 mdl 11 or 3350 in mdl 11 mode may also be used for staging drives, however each 3333/3330 mdl 11 or 3350 in mdl 11 mode drive designated as a staging drive is equivalent to two mdl 1 or mdl 2 drives. These staging drives will be used by the 3850 Mass Storage System to provide virtual storage. See note

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3830 Storage Control (cont’d)

on M3333 pages for feature changes required when 3333’s are retained for use with a 3851.

Staging Paths — the 3830 mdl 3 contains control storage for data staging and microcode. This accomplishes data staging without utilizing S/370 or 4341 Processor channels or memory.

Real Drives — up to a maximum of 32 attached drives may be designated as real. Each real drive uses one of the 192 unique 3830 addresses. All 3350 drives attached to a 3830 Mdl 3 with feature #8250 must be designated as real in 3330 native mode only. 3350 drives attached to a 3830 mdl 3 with feature #6250 may be designated as real in 3350 native or 3330 mdl 11 mode.

Virtual Storage — all data stored in the 3850 Mass Storage System appears to the system as residing on a 3333/3330 storage device with all the data handling capabilities of the 3330 available.

PREREQUISITES: The 3830 mdl 3 must have the Two Channel Switch (#8170) and Control Store Extension (#2150). One channel interface attaches to the 3851 MSF and one channel interface attaches to the host Processor.

Limitations:

1. A maximum of four 3830 mdl 3s may be attached to a S/370 or 4341 block multiplexer channel. If 3830mdl 1s or 2a and/or Integrated Storage Controls (#4650) are attached to the same block multiplexer channel, the maximum number of 3830 mdl 3s will be reduced. Consult IBM 3850 Mass Storage (MSS) Installation Planning and Table Create, GC35-0028 for total system limitations.

2. String Switch (#5810) may be installed on the 3333/3350 in a 3850 MSS for additional availability. Installation is not recommended in a mixed MSS/Non-MSS environment. See 3333/3350 for additional limitations.

3. 3340 DASD cannot be installed on the 3830 Model 3.

Bibliography: GC20-0001

SPECIFY: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, or #9905 for 230 V ... must be consistent with 3333/3330 voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] DASD Designation: #3138 for 3333/3330 DASD, or #3320 for 3333/3330/3350 DASD. 

PRICES: Mdl MRC 2 yr Purchase MMMC

| 3830 3 | $3,370f|$2,831f | $92,180 $235 |

Plan Offering: Plan A, Additional Use Charge Rate: 10% Metering: Assignable Unit Warranty: B Machine Group: A Purchase Option: 60% Useful Life Category: 1 Per Cell: 3 Mode/Feature Additional Charge in lieu of AU Charge: 10% Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

(a) FTP/MLC also available — 12-23 months = $3,100f ...

(b) FTP/MLC also available if 3830 on FTP/MLC $2,050 — 12-23 months = $338f, $2,150 — 12-23 months = $327f, $2,250 — 12-23 months = $317f ...

Model Changes: 3830 mdl 2 can be field changed to a mdl 3. MES order for model change must include correct serial number and all installed and on order features and RPQs on the 3830 mdl 2 to be changed. It must also include removal of any of the following which are installed: #9190, #9314, #9315, #9317, #9318, #9841. Prior to ordering the model change, installed and on-order RPQs should be resubmitted.

Control Store Extension (#2150) and Two Channel Switch (#8170) must be previously installed or installed concurrently with the model upgrade. For customers who wish to have an installed 3830 mdl 1 converted directly to a 3830 mdl 3, submit an RPQ.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 2 to Model 3 ........ $44,380.

"Customer price quotations and customer order acknowledgement letters for purchase. The model upgrade involves the removal of parts which become the property of IBM."

SPECIAL FEATURES

CONTROL STORE EXTENSION (#2150). [Req’d on mdl 3] Provides additional control store for microprogram use. Field Installation: Yes.


CONTROL STORE ADDITIONAL (#2152) Provides additional control store for microprogram use. Required if 3350 DASD is attached. Maximum: One. Field Installation: Yes. Prerequisite: Control Store Extension (#2150), Register Expansion (#6111), and Expanded Control Store (#2151).

REGISTER EXPANSION (#6111) Provides additional registers for microprogram use. Required if 3350 DASD is attached. Field Installation: Yes. Maximum: One.

REMOTE SWITCH ATTACHMENT (#6148). To attach the Two Channel Switch (#8170) to a configuration panel. Maximum: One. Field Installation: Yes.


3350 STAGING (#6250). Provides for staging to 3350 drives in 3330 mdl 11 mode and access to Real 3350 in either native or 3330 mdl 11 mode. Limitation: Attachment of 3333 mdls 1/11, 3330 mdls 1, 2 or 11 is mutually exclusive with this feature. Maximum: One. Field Installation: Yes Prerequisites: Control Store Additional (#2152) and Register Expansion (#6111).

TWO CHANNEL SWITCH (#8170). [req’d on mdl 3]. Provides system channel attachment capability for the 3380 mdl 3. One channel interface attaches to the 3851 MSF and one channel interface attaches to the host Processor. An available control unit position is required. See "Prerequisites" and "Limitations." Field Installation: Yes.

TWO CHANNEL SWITCH, ADD’L (#8171). Provides attachment for two additional channels to the 3830 mdl 3, providing three Processor channel switch capability. Limitation: Only two of the three channel interfaces available can be attached to channels on the same Processor. Maximum: One, see "Prerequisites" and "Limitations." Field Installation: Yes. Prerequisite: Two Channel Switch (#8170).

ETP/ MRC/MAC/MLC/

Special Features Price: MRC 2 yr (b) Purchase MMMC

Control Store Extension #2150 f#402 $338 $11,000 $10.50

Expanded Control Store 2151 247 207 6,730 $10.50

Control Store Additional 2152 247 207 6,730 $10.50

Register Expansion 6111 24 20 64 4.00

Remote Switch Attach #6148 NC NC NC NC

Remote Sw Attach, Add’l #6149 NC NC NC NC

3350 Staging #6250 NC NC NC NC

Two Channel Switch #8170 171 144 4,890 $10.50

Two Channel Sw, Add’l #8171 171 144 4,890 $10.50

(b) FTP/MLC also available if 3830 on FTP/MLC $2,075 — 12-23 months = $338f, $2,150 — 12-23 months = $327f, $2,250 — 12-23 months = $317f ...

* Feature supplies ISC diskette.

$ MAC/MRC, ETP, MLC, and FTP/MLC prices effective 6/1/79.
Purpose: An auxiliary processing unit for 3/370 mdls 145, 148, 151, 168 and 3032, 3033 or 3031, 3032, 3033 or 3031, 3032, 3033 attaches on a block multiplexer channel. Processes single precision floating point vector operations found in seismic trace processing and other applications.

Model 1 Contains 256K bytes of bulk storage.
Model 2 Contains 512K bytes of bulk storage.
Model 3 Contains 1,024K bytes of bulk storage.

Highlights: Permits systems with a high content of vector processing operations to execute the vector work in parallel with CPU host processing thereby releasing the CPU for other multiprogrammed system tasks. User programmable by coding available instructions to define complete processing sequences. Contains five functional components each capable of overlapped or concurrent operation to sustain processing performance.

Channel Interface -- allows data and control information to transfer in block multiplexer mode at data rates up to 1.5 MB, or when attached to a 3/370 mdl 168 or a 3032 or 3033 Processor, at data rates up to 3.0 MB with the two-byte interface feature in conjunction with the 2880 equipped with a similar feature (#7850 or #7851) or on the 3032 or 3033, when the channel to which it is attached is equipped with a similar feature (#7850).

Bulk Storage -- provides independent data storage for up to seven concurrent 3838 users; seven is the upper limit on 3838 user partitions but is not restrictive of the number of host regions executing 3838 destined jobs. The user partitions may be shared or exclusive ... receives input data from the host and buffers for processing ... during processing of algorithm sequences, provides initial, intermediary, and final result data storage. Final results are subsequently transmitted to the host under control of a pending CCW on the block multiplexer channel.

Data Transfer Controller -- provides multiplexing of the internal data bus for concurrent transfers of data between the functional elements.

Arithmetic Processor -- controls algorithm execution for processing vectors through the 100ns/stage pipelined arithmetic unit ... algorithmic and be utilized in the application program of individual users to provide comprehensive processing techniques unique to each user. Algorithm control store may be expanded from the basic 16,384 bytes for all models with the control store additional feature (#1551) which provides an additional 16,384 bytes of control storage.

Control Processor -- manages the total 3838 subsystem functional operation, synchronizing all data transfers and arithmetic operations, performing logical decisions in algorithm chains, and sequencing multiple users problems through the array processor.

The Instruction Set includes the following vector processing algorithm and logic operations:

Algorithm/Mnemonic

<table>
<thead>
<tr>
<th>Arithmetic Instructions (standard)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vector Move (VMV)</td>
<td>Vector Move Convert (VMC)</td>
<td>Scalar Move (SMV)</td>
</tr>
<tr>
<td>Zero Move (ZM)</td>
<td>Vector Floating Point to Fixed Point Conversion (VFX)</td>
<td>Convolving Multiply (CVM)</td>
</tr>
<tr>
<td>Quadratic Interpolation (INT)</td>
<td>Vector Element-by-Element Sum (VES)</td>
<td>Scalar Element-by-Element Sum (SSEUM)</td>
</tr>
<tr>
<td>Vector Element-by-Element Multiply (VEM)</td>
<td>Scalar Multiply (SMY)</td>
<td>Sum of Squares (SSQ)</td>
</tr>
<tr>
<td>Fast Fourier Transform (Forward Real) (FTFR)</td>
<td>Fast Fourier Transform (Forward Complex) (FTFC)</td>
<td>Fast Fourier Transform (Inverse Real) (IFTR)</td>
</tr>
<tr>
<td>Fast Fourier Transform (Inverse Complex) (IFTC)</td>
<td>Complex Multiply (CEM)</td>
<td>Complex Multiply (Complex Conjugate) (CMCC)</td>
</tr>
<tr>
<td>Complex Multiply (Conjugate Output) (CMCO)</td>
<td>Scalar Complex Multiply (Conjugate Output) (SCMO)</td>
<td>Signed Square Array (SSA)</td>
</tr>
<tr>
<td>Sum of Vector Elements (VEV)</td>
<td>Array Scan for Maximum (MAX)</td>
<td>Vector Inner Product (VIP)</td>
</tr>
<tr>
<td>Vector Element Limit (LIM)</td>
<td>Divide (DIV)</td>
<td>Scalar Divide (SDIV)</td>
</tr>
<tr>
<td>Square Root (SORT)</td>
<td>Wiener-Levinson (WLEV)</td>
<td>Not to be reproduced without written permission.</td>
</tr>
</tbody>
</table>
3838 Array Processor (cont’d)

Nth Zero Crossing (NZCP/NZCN) The NZCP/NZCN operation scans an input vector X and returns in the Y vector (1) the count of elements in the segment that represent the Nth time the data contain zero crossings. The scan may be in order of increasing index (NZCP) or decreasing index (NZCN).

Quadratic Interpolation (INT) The INT operation performs a table lookup and interpolation function on a table of given data, and a set of indicators into this table. The interpolation calculation is along a parabola drawn two points to the left and one point to the right of the chosen location, except where the chosen location is within the first input interval in which case the interpolation is based on one point to the left and two points to the right of the chosen point.

Complex Multiply (CEM) The CEM operation provides a resultant vector Y with complex elements from input vectors X and U each of which have complex elements. The operation may be specified to perform Complex Multiply (CEM), Scalar Complex Multiply (SCM), Complex Multiply (Complex Conjugate) (CMCC), Complex Multiply (Conjugate Output) (CMCO) or Scalar Complex Multiply (Conjugate Output) (SCMC).

Square Root (SQRT) The SQRT operation takes the square root of the magnitude of an input vector or scalar X and places the result in output vector or scalar Y.

Wiener-Levinson Filter (WLEV) The WLEV operation accepts as its input a characterization of a signal and the type of noise encountered when reading that signal, and produces as an output the coefficients for a digital filter to remove the noise. The coefficients are chosen to minimize the RMS error in the output of a filter when the input consists of the expected signal, plus noise of the expected type.

Fast Fourier Transform (FFT) The FFT operation performs the forward or inverse Fast Fourier Transform in either of two modes: one where the time domain data is known to be complex (FFTC and IFFT) and one where it is real data (FFTFR and IFFTR).

Polynomial Expansion (POLY) (#9301) The POLY operation applies up to a 24th order polynomial expansion to the input vector X using coefficients provided in the U vector.

Logarithm (LOG) (#9302) The LOG operation determines the logarithm to the base e of an input vector X. PREREQUISITES: POLY (#9301) and Arithmetic Element Storage Additional (#1551) is required.

Exponential (EXP) (#9303) The EXP operation provides the antilog to the base e of an input vector X. PREREQUISITES: POLY (#9301) and Arithmetic Element Control Storage Additional (#1551) is required.

Tangent (TAN) (#9304) The TAN operation provides the tangent of an input vector X. PREREQUISITES: POLY (#9301) and Arithmetic Element Control Storage Additional (#1551) is required.

Arctangent (atan) (ATAN) (#9305) The ATAN operation provides the arctangent Y of an input vector X. The range of Y is -π/2 to +π/2 radians. The alternate version of Arctan is ARCTAN with the control processor and vector operations which are executed by the arithmetic processor. The arithmetic processor contains a 16,384 byte reloadable control store which contains the algorithms necessary to perform the vector operations. These are loaded when the 3838 is IPL/IMPILED from the host system. Selected arithmetic algorithms from the optional arithmetic instructions may be added to the standard arithmetic instructions or, additional algorithms may be added to the product via the Algorithm Design and Development Service capability. When the capacity of the 16,384 bytes of control store is exceeded it is necessary to add feature #1551 (Control Storage Additional) ... see Special Features.

Algorithm Prerequisites: Prerequisite machine or specify features for optional algorithms are as follows. The 3838 is supported on S/370 mld 145, 148, 158, 168 and a 4341 Processor with OS/VS1 and mlds 158 and 168 with OS/VS2 MVS, Multiple 3838 Arithmetic Processors attached to a single S/370 or 4341 host, should each have identical algorithm sets because VPS allocates ports based only on bulk store partition size and shared versus exclusive usage.

Minimum System Requirements:
1. S/370 mld 145, 148, 158, 168 or 3031, 3032, 3033, or 4341 Processor with block multiplexer channel.
2. Nine track, 1600 BPI P.E. magnetic tape (factory order note specifying type and density, if other).
3. OS/VS2 (MVS) Release 3.7 and Selectable Units for Scheduler (SU4), Supervisor 1 (SU5), Supervisor 2 (SU7), Scheduler/IOS Support (SU16), EREP (SU27), 3838 Vector Processing Subsystem Support (SU29) plus Vector Processing Subsystem (VPS) Independent Release (IR) and Job Entry Subsystem 2 (SU3) or Job Entry Subsystem 3 (SU12) and Job Entry Subsystem 3 M SS Support (SU18) or OS/VS Release 6 with Selectable Unit for Subsystem Attachment Support (SU6), and EREP (SU1). FE maintenance and service capability is affected if any of the above are NOT part of the system configuration.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): 9003 for 208 V, or #9005 for 230 V - must be consistent with system specification. FIELD INSTALLATION: Yes.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white. FIELD INSTALLATION: Yes.

[3] Cabling: #9080 for below floor, or #9081 for on the floor. FIELD INSTALLATION: Yes.


[5] Specify: #9301 for Polynomial Expansion #9302 for Logarithm #9303 for Exponential #9304 for Tangent #9305 for Arctangent, Arctangent 2 #9307 for Recursive Filter #9308 for Vector Reverse TLP

PRICES: Mdl MRC 4 yr Purchase MMNC

<table>
<thead>
<tr>
<th>Mdl</th>
<th>$17,875</th>
<th>$16,250</th>
<th>$780,000</th>
<th>$1,725</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>$21,750</td>
<td>$19,750</td>
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</tr>
<tr>
<td>3</td>
<td>$29,425</td>
<td>$26,750</td>
<td>1,032,000</td>
<td>2,790</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B Warranty: A Maintenance: D Purchase Option: 60% * Useful Life Category: 2 Per Call: 3 Termination Charge Months: 6 Termination Charge Percent: 28% Upper Limit Percent: 5%
MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

<table>
<thead>
<tr>
<th>From to</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1</td>
<td>$84,000</td>
<td>$252,000</td>
</tr>
<tr>
<td>Model 2</td>
<td>168,000</td>
<td></td>
</tr>
</tbody>
</table>

SPECIAL FEATURES


TWO BYTE INTERFACE (#7850). Provides two byte parallel transfer on the 2880 block multiplexer channel to achieve data transfer rates up to 3.0 MB. Maximum: One. Field Installation: Yes. Prerequisite: Requires Two Byte Interface (#7850 or #7851) on the 2880, 3032 or 3033.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Arithmetic Element Control</th>
<th>MAC/M</th>
<th>MRC</th>
<th>4 yr Purchase MMC</th>
<th>TLP/MMMC</th>
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</thead>
<tbody>
<tr>
<td>Storage Add'l #1551</td>
<td>$2,420</td>
<td>$2,200</td>
<td>$105,600</td>
<td>$86</td>
</tr>
<tr>
<td>Two Byte Interface 7850</td>
<td>220</td>
<td>200</td>
<td>9,600</td>
<td>8</td>
</tr>
</tbody>
</table>

* Purchase option is 50% under Term Lease Plan (TLP).
Purpose: Used to provide terminal loop capability at locations connected via telephone to a 3631 or 3632 Plant Communication Controller, or an 8100 System via the data link.

The 3842 controls the operation of a single lobe loop and provides an interface to a common carrier provided voice grade private line (non-switched) channel that is terminated at a 3631, 3632 or 8100 System via an IBM 3872 Modem. Loop and common carrier channel data speed is 2400 bps. The 3842 attaches a loop to a standard loop connector cable furnished with the unit. This cable plugs into a wrap type Loop Station Connector not provided with the 3842.

Highlights:

A 3842 Loop may be up to 3.2 cable kilometers (2 cable miles) in length.

All terminals that can attach to a 3631 or 3632 Controller Attached Loop or 8100 System Direct Attached Loop may also attach to a 3842 Data Link Attached Loop.

Controls polling and, with one poll command addressed to it, can provide responses from all loop attached terminals.

Can operate in point-to-point or multipoint mode. Operates in a controlled carrier mode on half duplex or duplex point-to-point, or on 4-wire multipoint facilities.

Switched Network Backup - Manual Answer is offered as an optional feature ... see “Special Features.”

Data Rates: 2400 bps with back-up half speed of 1200 bps on both the loop and communication facility.

Problem Determination Aids:

Can execute “On Line” diagnostic commands to perform self tests and to assist in locating loop wiring, terminal, or communication line failures at the remote site.

Can be “Line Tested” with the 3872 Modem at the controller/processor and telecommunication channel independently of the controller/processor.

A Speed Select switch is provided as standard equipment. This allows the 3842 to operate the loop and communications line at half speed.

Offline tests are provided to perform self tests of the 3842 with or without involving loop wiring and/or loop terminals.

Physical Environments: The 3842 Loop Control Unit has been designed for operation in physical environments characteristic of office area. See IBM 3630 Plant Communication System Description Manual, GA24-3652, or Introduction to the 8100 System Manual.

Communication Facilities:

Nonswitched Lines: Communication common carrier provided voice band Private line (non-switched) channel, Type 3002 (or equivalent) as described in the Bell System Technical Reference PUB 41004, dated October, 1973. Duplex (4-wire) required for multi-point and also recommended for point-to-point.

Privately Owned Telecommunication Facilities: Equivalent to the above.

Public Switched Telecommunication Networks: ... see “Special Features.” The customer must be advised that satisfactory data transmission depends upon the characteristics of the particular switched network connection being used. See M 2700 pages for further details.

International Facilities: Transmission of data between the United States and Canada on non-switched facilities is supported ... for non-switched operation, the channel in Canada must be a Schedule 4, Type 4.

Attachment to Facilities: Attachment to a private line (non-switched) channel is by a cable, supplied with the 3842 which is terminated with a four prong plug (WE 3858, or equivalent). The plug mates with a receptacle (WE 4048 or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communication equipment and is, upon customer request ordingly furnished by the telecommunication service supplier). Note: A pigtail cable (Part No. 1855134) will be provided with each 3842 to a allow a 3842 to be connected when a WE 4048 or 549A receptacle is not available from the local telecommunication service supplier.

If the 3842 is equipped with Switched Network Backup (4) #7951, another cable is supplied with the feature. This cable is terminated with a four prong plug and requires the aforementioned type of receptacle which is connected to the communication controller, or an 8100 System via the data link.

Data Access Arrangement CDT (WE 1000A) or FCC certified equivalent.

Related Equipment: The 3842 communicates with an appropriately configured 3872 Modem attached to a 3631 or 3632 with EIA/CCITT Interface Data Link (370100), see the IBM System 3630 Plant Communication System Loop Installation-Physical Planning, GA24-3675, and Communications System Loop Installation-Physical Planning Manual, or the 8100 System Installation Manual - Physical Planning Manual. The customer is responsible for:

1. Private Line (non-switched) Channel -- arranging for the telecommunication service supplier to provide a Type 3002 voicegrade data channel (or equivalent) as described under “Communications Channel Specification” in the IBM 3630 Plant Communication System Description and the 2700 pages.

2. Switched Telecommunication Network -- arranging for the telecommunication service supplier to install the appropriate communication service equipped with the required data access arrangement as described in Attachment to Facilities.

3. Using the problem determination procedures and filling out the trouble report prior to calling for service.

4. Providing voice communications between the 3842 and the processor/controller location to coordinate tests or re-equalization. The voice facility must be located such that an operator can use it while operating the controls on the front of the 3842 Alternate Voice Feature. See “Special Features.”

5. Purchase, installation, testing, and maintenance of the loop Cabling Systems, Purchase Loop Continuity and Relay Tester, or equivalent, to test the loop wiring.

6. When installed on a 3630 Plant Communication System, the 3842 must be installed near a 3643. When installed on an 8100 System, the 3842 must be installed near a 3276 Control Unit Display Station, a 3278 Display Station, or an 8775 Display Terminal. These devices are required for remote loop installation, problem recovery procedures, and maintenance.

Prerequisites: An appropriately configured 3872 Modem installed at the controller/processor end of the telecommunication service. Note: Because the 3842 operates on a basic 3002 channel, the 3872 may require an RPO. See “Communication Facilities” section of 3872 writeup in “Machines” for further information.

One of the following special features must be installed on the 3842: Multipoint Tributary (#5101), or Point-to-Point (#6101) ... see “Special Features.”

A wrap type Loop Station Connector for connecting the 3842 to the Loop.

SPECIFY: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz); Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V. Note: 115 V is usable on 120V systems. Field Installation: Not recommended.

[2] Loop Station Connector Cable: A 2.1 meter (7 foot) cable will be furnished as standard. If a 4.2 meter (14 foot) cable is desired, specify #9410.

[3] Telecommunication Cable (modem to telecommunication facility): Specify one of the following for each telecommunication channel or network connection -- #9750 ... to connect a 3872 equipped with Multipoint Tributary (#5101, or Point-to-Point (#6101) feature. to private line (non-switched) channel ... #9754 to connect a 3872 equipped with Switched Network Backup (#7951) to a switched telecommunication network.

A 3.0 meter (10 foot) cable will be supplied. If a longer cable is required, indicate 4.5, 6.0 or 7.5 meters (15, 20 or 25 feet) as the quantity of the cable specified (#9750, 9754). Note: MES orders to add the Switched Network Backup Feature (#7951) must include the telecommunication cord specify the data rate and Branch Office as applicable. The IBM 3630 Plant Communication System Loop Installation-Physical Planning, GA24-3675, also specify the telecommunication cable (#9750, 9754) for the Switched Network Backup feature.

[4] 3630 Test Loop: Specify #9445 on the first 3842 to be used with a 3631 or 3632 and located in a different servicing branch office from the 3631 or 3632.

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### 3842 Loop Control Unit (cont'd)

#### PRICES:

<table>
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<th>5 Yr</th>
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Purchase Option: 55%
Per Call: 1
Maintenance: D
Warranty: B
Useful Life Category: 2
Termination Charge Months: 6
Termination Charge Percent: 20%
Upper Limit Percent: 5%

### SPECIAL FEATURES

#### ALTERNATE VOICE (#1051). Provides signalling capability and a socket on the operator panel into which a customer provided handset may be plugged permitting voice communication with the distant 3872 Modem. Data cannot be simultaneously transmitted with voice. A handset is not provided. **Maximum:** One. **Limitation:** Cannot be used when the 3842 or the 3872 Modem at the controller/processor end is in switched back-up operation. **Field Installation:** Yes.

#### MULTIPOINT TRIBUTARY (#5101). Used on each 3842 attached as a tributary station in a centralized multipoint network. **Note:** The 3872 Modem at the controller/processor end and must always serve as the control station. This feature provides an operator adjustment on the front panel of the 3842 to compensate for line distortion. **Maximum:** One. **Limitation:** Cannot be installed with Point-to-Point (#6101). See "Prerequisites" above. **Field Installation:** Yes.

#### POINT-TO-POINT (#6101). Used on the 3842 and on a 3872 Modem at the controller/processor end of a point-to-point private line (non-switched) channel. This feature provides an operator adjustment on the 3842 front panel to compensate for line distortion. **Maximum:** One. **Limitation:** Cannot be installed with Multi-point Tributary (#5101). See "Prerequisites" above. **Field Installation:** Yes.

#### SWITCHED NETWORK BACK-UP MANUAL ANSWER (#7951). Provides the capability of attaching the 3842 to the public switched network as back-up to the private line (non-switched) channel. In back-up mode it can communicate point-to-point with a 3872 Modem at the controller/processor that is equipped with Switched Network Back-up (#7951). A fixed compromise equalizer is provided for the back-up operation. A front panel switch permits operator selection of either the prime or the back-up facility. Both facilities cannot be used simultaneously.

Attachment to the switched network is made via the common carrier Data Access Arrangement Type CDT (or FCC certified equivalent). Calls must be established and answered manually. **Note:** To use this feature, operator intervention at the 3872 Modem is required. Loop attached terminals will not be required to make any modification. Conditioning of the telecommunication service local loop for transmission of data greater than 300 bps is required. **Maximum:** One. **Limitations:** Customer must be cautioned not to use this feature as a prime mode of operation but in back-up mode only. **Specify:** Telecommunication Cord -- #9754. **Field Installation:** Yes.

### MLC Special Feature Prices:

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*Pilot Test Plan applies.*

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### 3845 DATA ENCRYPTION DEVICE

**Purpose:** A table top or shelf mounted encryption/decryption device for data transmitted over a communication line. The 3845 is positioned between a data terminal equipment (DTE) and the data communications equipment (DCE), one at each end of a half duplex or duplex communication line. The 3845 will operate with Start-Stop, Biphasic, or A synchronous Data Link Control (SDLC) protocol at speeds ranging from 110 bps to 19,200 bps. See "Limitations" under "Communications."

#### Attached Devices: The 3845 is transparent to the DCE and the DTE. Control signals used by the 3845 are re-driven in compliance with the EIA-CCITT specifications. All other signals are cabled through the 3845. The 3845 will attach wherever EIA-232C/CCITT-V.24 interface requirements are met.

#### Models 1-3 -- for use with Start-Stop or SDLC line protocol (5/5 or SDLC).

- **Model 1** A single half duplex unit operating on a 2 or 4 wire half duplex communication line.
- **Model 2** A dual half duplex unit, with each half duplex device completely independent of the other, operating over two wire duplex communication lines.
- **Model 3** A full duplex unit operating over full duplex communication line.

#### Models 11-13 -- for use with Bisynchronous, Synchronous, or Asynchronous Data Link Control (SDLC).

- **Model 11** A single half duplex unit, operating on a 2 or 4 wire half duplex communication line in BSC/SDLC or BSC with BMC/SDLC... see Specify Features.
- **Model 12** A full duplex unit, with each half duplex device completely independent of the other, operating over 2 or 4 wire half duplex lines in BSC/SDLC or BSC with BMC/SDLC... see Specify Features. Limitation: A model 12 must have both outputs either BSC/SDLC or BSC with BMC/SDLC.
- **Model 13** A full duplex unit operating over full duplex communication line in BSC/SDLC or BSC with BMC/SDLC... see Specify Features.

#### Highlights:
A communication security device that provides encryption/decryption of digital data over a communication line. The 3845 implement the Data Encryption Standard (DES) conforms to the National Bureau of Standards DES algorithm published as FIPS #46, January 15, 1977.

Two or more data encryption devices (3845 or 3846) are needed, one at each termination of a communication line (point-to-point or multi-point). Limitation: A 3845 or 3846 is required at each node in order to have message header information in the clear through that node.

The 3845 is cabled to the DTE via the cable that is provided by the DTE manufacturer for attachment to the DCE. Attachment from the 3845 to the DCE is by a cable provided with the 3845. One cable is provided per line function. The cable used with the 3845 is 1.5 metres long (5 ft.). This adds load capacitance to the DTE/DCE. See the General Information Manual, GA27-2988, for specific information on the additional transmission distance.

An accessory, the Personalization/Key Entry Unit (P/KEU), must be available at each site location having a 3845. This accessory is used to enter the key variable, the seed, and to personalize the 3845 to the customer’s communication line. The key variable is a 56 bit plus parity code, entered by the customer at a frequency consistent with his security requirements. The customer defines his own keys, selects them in a random manner, and enters them manually. The seed is 1 to 16 hexadecimal random characters used to initiate the synchronization message. The personalization consists of 4 hexadecimal characters of information that personalizes the 3845 to the communication facilities, such as line discipline, line speed, method of clocking, and synchronization message length.

The 3845 has a by-pass switch that allows messages to be sent in the clear and is also used by the customer in fault isolation. A battery is provided that maintains power to the storage registers containing the key variable, seed, and personalization data when the 3845 AC power is removed.

Security is provided by use of interlecks that remove power, including battery power, from the storage registers whenever the service cover is removed. The seed, key variable and personalization must be re-entered when all (battery and AC) power is removed.

#### Communications:
A 3845 models 1, 2 and 3 encrypt/decrypt data if (a) the DTE/DCE conforms to interface EIA-RS-232C or CCITT-V.24, (b) uses BSC or SDLC protocol, (c) operates on a half duplex or duplex facility, (d) is within the speed of 110-9600 bps for asynchronous operation or the speed of up to 19,200 bps for synchronous operation, and (e) uses a 7 or 8 bit code (exclusive of the required start and stop bits) for asynchronous operation or uses an 8 bit SDLC flag for SDLC operation.

The 3845 models 11, 12 and 13 encrypt/decrypt data if (a) the DTE/DCE conforms to interface EIA-232C/CCITT-V.24, (b) uses the BSC or SDLC protocol, (c) operates on a half duplex or duplex facility, (d) is within the speed of up to 19,200 bps, and (e) uses an EBCDIC or ASCII code for BSC or uses an 8 bit SDLC flag for SDLC operation.

#### Limitations:
(1) SDLC will not operate with Non-Return to Zero Inverted (NRZI) transmission mode. NRZI describes the way information bits are presented at the E.I.A. interface. NRZI is required in some SDLC networks when using IBM 3872 modems to ensure modem synchronization. (2) Operation at 19,200 bps may require the user to optimize cable length and quality. For additional information, refer to the General Information Manual, GA27-2988.

#### Data Communications Equipment: Data Communications Equipment operating in non-NRZI is needed with the 3845 when operating in SDLC protocol. IBM external modems may be attached to the 3845, i.e.:

- **Modem Speed (bps)**
  - 3872 1200/2400 (BSC only)
  - 3874 4800
  - 3875 7200

#### Problem Determination Procedures:
A by-pass switch is provided that allows transmission in the clear to permit determining whether a problem exists in the 3845 itself or in other equipment. See "Customer Responsibility" below. Problem determination is a customer responsibility that does not involve the customer engineer.

#### Customer Responsibility:
- Provide an adequate site and other preparation.
- Receipt at the customer’s receiving dock, unpacking and set up of the 3845.
- Connect cables to the DTE and DCE.
- Personalize to the communication facilities.
- Enter the seed.
- Enter the key variable.
- Use and follow the problem determination procedures and the following instructions for service of the 3845.

#### Note: Appropriate procedures are provided by IBM for personalization and entering the seed and key variable.

#### Maintenance:
Spare: The customer may wish to replace a failing 3845 with a spare and must be purchased separately. The number of spare devices recommended is dependent upon the number of devices the customer has installed, his application requirements, physical locations, and layouts.

#### IBM Repair Center Service: Maintenance of the 3845 will normally be at a designated IBM Repair Center. All maintenance, parts replacement, adjustments, and repair shall normally be performed at the designated IBM Repair Center. It shall be the customer’s responsibility to determine the failing device, pack the device in the designated shipping container and ship it prepaid to the designated IBM Repair Center.

IBM will prepay the transportation charges for return of the repaired device. There is no regularly scheduled preventive maintenance recommended by IBM on these devices.

The repair service is available under an IBM Repair Center Maintenance Supply agreement or under the IBM Maintenance Agreement for on a Time and Material basis.

Customers with machines not under an IBM Maintenance Agreement have the option to ship the machines to the designated IBM Repair Center for repair under the IBM Repair Center Machine Repair Authorization Form GX27-2981, in which case repair will be made (if the machine is repairable). Alternately, upon request, the IBM Repair Center will provide, for a minimum charge, an estimate of repair charges. This charge covers handling, inspection, adjustments, testing, return shipping charges and estimating of repair charges.

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3845 Data Encryption Device  (cont'd)
The 3845 is eligible for maintenance agreement service immediately following expiration of the service and parts warranty at the monthly charge shown under MMMC in "PRICES" below.

If maintenance agreement service is not contracted for immediately following expiration of the service and parts warranty and the customer wants agreement service, the customer may ship the machine(s) to the designated IBM Repair Center for an inspection. It, on the basis of an inspection, the repair center concludes that a machine is not repairable, no further work will be performed and the machine will be returned to the customer with a minimum charge to cover handling, inspection, testing, and a return shipping charge.

In all other cases, the IBM Repair Center will charge a minimum fee per machine to cover handling, inspection, adjustments, testing, and return shipping. In addition all parts needed will be billed at IBM's prevailing parts prices and the additional time required for repairs will be billed at IBM's applicable service rates, if so authorized by the customer. The machine will then be eligible for maintenance agreement service.

PREREQUISITES:  (1) A S/S, BSC or SDLC communication line ... (2) Compliance with EIA-RS-232C or CCITT-V.24 ... (3) External modems, IBM or non-IBM ... (4) Personalization/Key Entry Unit (Accessory) available at site location. See M10000 pages.


Specify:  [1] Line Voltage Plug (115/120 V Power and Line Cord, 1-phase, 60 Hz) ... #9890 for locking plug ... #9891 for non-lock plug.

[2] Line Cord Length:  If the standard 2.8 m (9 ft.) power cable is not desired, specify: #9511 for 1.8 m (6 ft.) line cord, #9512 for 3.7 m (12 ft.) line cord, #9513 for 4.5 m (15 ft.) line cord.

[3] For 3845 models 11, 12 and 13: Specify one ... installation available at time of manufacture only.

#9110 -- BSC/SDLC, or
#9115 -- BSC with BMC/SDLIC

PRICES:  Mdl Purchase MMMC

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<tr>
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Warranty: B Useful Life: 2

Model Changes: At time of manufacture only.

ACCESSORIES: The following items are available on a purchase only basis. Order the Part No. indicated below at the price listed in the M10000 pages. See M10000 pages for additional information.

Personalization/Key Entry Unit (Part No. 4407908) to enter key variable, seed, and personalization data. One must be available at each site.

A Battery (Part No. 1743456), is needed to replace the installed battery. The replacement schedule is defined in the Principles of Operation manual. Discharged batteries should be returned to IBM.

3846 DATA ENCRYPTION DEVICE

Purpose: A rack mounted encryption/decryption device for data transmitted over a communication line. The 3846 is positioned between a data communications equipment (DCE) and a data terminal equipment (DTE), one at each end of a half duplex or duplex communication line. The 3846 will operate with a Start/Stop, Bisynchronous, or Synchronous Data Link Control (SDLC) protocol at speeds from 110, bps to 19,200 bps. See Limitations under 'Communications'.

Attachable Devices: The 3846 is transparent to the DCE and DTE. Control signals used by the 3846 are redriven in compliance with the EIA-RS-232C or CCITT-V.24 specification. All other signals are cable fed through the 3846. The 3846 will attach wherever EIA-RS-232C/CCITT-V.24 interface requirements are met.

Model 1  A power unit capable of providing power to 1 to 4 line function units.

Models 2 and 3 for use with Start/Stop or Synchronous Data Link Control (SDLC) line protocol meeting EIA-RS-232C or CCITT-V.24 interface. Requires a 3846 mdl 1 for power.

Model 2  A dual half duplex line function unit, with each half duplex device completely independent of the other, operating over 2 or 4 wire half duplex communication lines.

Model 3  A full duplex line function unit operating over a full duplex communication line.

Models 12 and 13 for use with Bisynchronous, Bisynchronous with Business Machine Clocking (BSC, BSC with BMC), or SDLC with EIA-RS-232C or CCITT-V.24. Requires a 3846 mdl 1 for power.

Model 12  A dual half duplex line function unit with each half duplex device completely independent of the other, operating over 2 or 4 wire half duplex communication lines in BSC, BMC, SDLC line protocol ... see Specify Features. Limitation: A model 12 must have both outputs either BSC/SDLIC or both BSC with BMC/SDLIC.

Model 13  A full duplex line function unit operating over a full duplex facility in BSC, BMC, SDLC line protocol ... see Specify Features.

Highlights: A communication security device that provides encryption/decryption of digital data, transmitted over a communication line. The 3846 implementation of Data Encryption Standard (DES) conforms to the National Bureau of Standards DES algorithm published as FIPS 46, January 15, 1977.

Two or more data encryption devices (3845 or 3846) are needed, one at each termination of a communication line (point-to-point or multipoint). Limitation: A 3845 or 3846 is required at each node in order to have message header information in the clear through that node.

The 3846 is cabled to the DTE via the cable that is provided by the DTE manufacturer for attachment to the DCE. Attachment from the 3846 to the DCE is by a cable provided with the 3846. One cable is provided per line function. Limitation: The cable provided with the 3846 is 1.5 metres (5 ft.) long. This adds load capacitance to the communication line. The 3846 implementation of Data Encryption Standard (DES) conforms to the National Bureau of Standards DES algorithm published as FIPS 46, January 15, 1977.

Security is provided by the use of interlecks that remove power, including battery power, from the storage registers containing the key variable, seed, and personalization data when the 3846 AC power is turned off.

Communications: The 3846 models 2 and 3 encrypt/decrypt data...
3846 Data Encryption Device (cont'd)

if (a) the DTE/DCE conforms to interface EIA-232C or CCITT-V.24, (b) uses a S/S or SDLC protocol ... (c) operates on a half duplex or duplex facility, (d) is within the speed of 110-19,200 bps, and (e) uses 7 or 8 bit transmission code exclusive of the required start and stop bits for asynchronous operation or uses an 8 bit SDLC flag for SDLC operation.

The 3846 models 12 and 13 encrypt/decrypt data if (a) the DTE/DCE conforms to interface EIA-232C or CCITT-V.24, (b) uses a BSC or SDLC protocol, (c) operates on a half duplex or duplex facility, (d) is within the speed of up to 19,200 bps, and (e) uses an EBCDIC or ASCII code for BSC or an 8 bit SDLC flag for SDLC operation.

Limitations: (1) SDLC will not operate with Non-Return to Zero Inverted (NRZI) transmission mode. NRZI describes the way information bits are presented at the EIA, interface. NRZI is required in some SDLC networks when using IBM 3782 modems to ensure modem synchronization. (2) Operation at 19,200 bps may require the user to optimize cable length and quality. For additional information, refer to the General Information Manual GA27-2865.

Data Communications Equipment: Data Communications Equipment operating in non-NRZI is needed with the 3846 when operating in SDLC protocol. IBM external modems may be attached to the 3846.

Modem Speed (bps)
3872 1200/2400 (BSC only)
3874 4800
3875 7200

Problem Determination Procedures: A customer installed switch panel must be used to permit determining whether a problem exists in the 3846 or in the other equipment. See "Customer Responsibility" below.

Problem determination is a customer responsibility that does not involve the customer engineer.

Customer Set-Up (CSU): The 3846 is designated as a customer set-up device, thereby offering the customer relocation flexibility. CSU is a customer responsibility that does not involve the customer engineer.

Customer Responsibility: The customer is responsible to:
- Provide an adequate site and other preparation.
- Receipt at the customer's receiving dock, unpacking and set up of the 3846.
- Make the interconnection between the 3846 and the 3846 line function devices.
- Personalize to the communication facility.
- Enter the seed.
- Enter the key variable.
- Use and follow the problem determination procedures and to follow instructions for service of the 3846.

Note: Appropriate procedures are provided by IBM for personalization and entering the seed and key variable.

Maintenance:
Spare: The customer may wish to replace a failing 3846 with a spare and must be advised to purchase sufficient spare devices for such use. The number of spare devices required is dependent upon the number of devices the customer has installed, his application requirements, physical locations, and layouts.

IBM Repair Center Service: Maintenance of the 3846 will normally be at a designated IBM Repair Center. All maintenance, parts replacement, adjustments, and repair shall normally be performed at the designated IBM Repair Center. It shall be the customer's responsibility to set up the equipment and to determine when remedial maintenance is required. When remedial maintenance is required, it shall be the customer's responsibility to determine the failing device, pack the device in the designated shipping container and ship it prepaid to the designated IBM Repair Center. IBM will pre-pay the transportation charges for return of the repaired device. There is no regularly scheduled preventative maintenance recommended by IBM for these units.

The repair service is available under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement on a Time and Material basis.

Customers with machines not under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement have the option to ship the machines to the designated IBM Repair Center for repair under the IBM Repair Authorization Form GX27-2981, in which case repair will be made (if the machine is repairable). Alternatively, upon request, the IBM Repair Center will provide, for a minimum charge, an estimate of repair charges.

Data Communications Equipment: Data Communications Equipment operating in non-NRZI is needed with the 3846 when operating in SDLC protocol. IBM external modems may be attached to the 3846.

Modem Speed (bps)
3872 1200/2400 (BSC only)
3874 4800
3875 7200

Problem Determination Procedures: A customer installed switch panel must be used to permit determining whether a problem exists in the 3846 or in the other equipment. See "Customer Responsibility" below.

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Customer Set-Up (CSU): The 3846 is designated as a customer set-up device, thereby offering the customer relocation flexibility. CSU is a customer responsibility that does not involve the customer engineer.

Customer Responsibility: The customer is responsible to:
- Provide an adequate site and other preparation.
- Receipt at the customer's receiving dock, unpacking and set up of the 3846.
- Make the interconnection between the 3846 and the 3846 line function devices.
- Personalize to the communication facility.
- Enter the seed.
- Enter the key variable.
- Use and follow the problem determination procedures and to follow instructions for service of the 3846.

Note: Appropriate procedures are provided by IBM for personalization and entering the seed and key variable.

Maintenance:
Spare: The customer may wish to replace a failing 3846 with a spare and must be advised to purchase sufficient spare devices for such use. The number of spare devices required is dependent upon the number of devices the customer has installed, his application requirements, physical locations, and layouts.

IBM Repair Center Service: Maintenance of the 3846 will normally be at a designated IBM Repair Center. All maintenance, parts replacement, adjustments, and repair shall normally be performed at the designated IBM Repair Center. It shall be the customer's responsibility to set up the equipment and to determine when remedial maintenance is required. When remedial maintenance is required, it shall be the customer's responsibility to determine the failing device, pack the device in the designated shipping container and ship it prepaid to the designated IBM Repair Center. IBM will pre-pay the transportation charges for return of the repaired device. There is no regularly scheduled preventative maintenance recommended by IBM for these units.

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Customers with machines not under an IBM Repair Center Maintenance Supplement to the IBM Maintenance Agreement have the option to ship the machines to the designated IBM Repair Center for repair under the IBM Repair Authorization Form GX27-2981, in which case repair will be made (if the machine is repairable). Alternatively, upon request, the IBM Repair Center will provide, for a minimum charge, an estimate of repair charges.

This charge covers handling, inspection, adjustment, testing, estimating of repair charges and return shipping charges.

The 3846 is eligible for maintenance agreement service immediately following expiration of the service and parts warranty at the monthly charge shown under MMMC in "PRICES" below.

If maintenance agreement service is not contracted for immediately following expiration of service and parts warranty and the customer now wants maintenance agreement service, the customer may ship the machine(s) to the designated IBM Repair Center for an inspection. If on the basis of an inspection, the repair center concludes that a machine is not repairable, no further work will be performed and the machine will be returned to the customer with a minimum charge to cover handling, inspection, testing and return shipping charges.

In all other cases, the IBM Repair Center will charge a minimum fee per machine to cover handling, inspection, adjustments, testing and a return shipping charge. In addition all parts needed will be billed at IBM's prevailing parts prices and the additional time required for repairs will be billed at IBM's applicable service rates if so authorized by the customer. The machine will then be eligible for maintenance coverage.

PREREQUISITES:
(1) A S/S, BSC or SDLC communication line ...
(2) Compliance with EIA-RS-232C or CCITT-V.24 ...
(3) External modems, IBM or non-IBM ...
(4) Accessory Personalization/Key Entry Unit available at site location ...
(5) Accessory mounting panel ...
(6) Accessory blank panel may be ordered if desired. See M10000 pages.

Bibliography:

Specify:
[2] Line Cord Length — if the standard 2.8M (9 ft.) power cable is not desired, specify: #9511 for 1.8M (6 ft.) line cord, #9512 for 3.7M (12 ft.) line cord, #9513 for 4.5M (15 ft.) line cord.
[3] For models 12 and 13: Specify one ... installation available at time of manufacture only.

PRICES:

<table>
<thead>
<tr>
<th>Mdl</th>
<th>Purchase</th>
<th>MMC</th>
</tr>
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<td>2,815</td>
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<tr>
<td>3850</td>
<td>2,580</td>
<td>4.50</td>
</tr>
</tbody>
</table>

Warranty: B Useful Life: 2

Model Changes: Available at time of manufacture only.

ACCESSORIES: The following items are available on a purchase only basis. Order the Part No. indicated below at the price listed in the M10000 pages. See M10000 pages for additional information.

Personalization/Key Entry Unit, Part No. 4407900, to enter key variable, seed, and personalization data. One must be available at each site.

Mounting Plate, Part No. 6813128, to attach 4 type 3846 units to a rack. One required for each 4 units.

Blank Panel, Part No. 4409058, to close any unused opening in a mounting panel. One may be ordered for each unused opening.

A Battery, Part No. 1743456, is needed to replace the installed battery. The replacement schedule is defined in the Principles of Operation Manual. Discharged batteries should be returned to IBM.

* SRL No. to be announced in future PRL.

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Purpose: Large capacity storage and control facility for the 3850 Mass Storage System (MSS) for attaching to S/370 mdls 145, 145-3, 148, 155 II, 158, 165 II and 168, or a 3031, 3032, 3033, or 4341 Processor.

Highlights: Included are the storage facility for data cartridges, Data Recording Devices (DRD) and their associated Data Recording Controllers (DRC) for the transfer of data between the data cartridges and the 3350/3333/3330 Disk Storage devices, a Cartridge Access Station for the manual entry and removal of data cartridges, two accessors and their associated controls for the movement of data cartridges within the 3851, and a Mass Storage Control (MSC) for control of the 3850 MSS.

Models: A-Series One Mass Storage Control
B-Series Two Mass Storage Controls ... one MSC is the active control ... the second is an alternate control.

Capacity

<table>
<thead>
<tr>
<th>Number of Cartridges</th>
<th>Max bytes Recording Devices</th>
<th>Data Recording Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model A1/B1</td>
<td>706</td>
<td>35.3</td>
</tr>
<tr>
<td>Model A2/B2</td>
<td>2044</td>
<td>102.2</td>
</tr>
<tr>
<td>Model A3/B3</td>
<td>3382</td>
<td>169.1</td>
</tr>
<tr>
<td>Model A4/B4</td>
<td>4720</td>
<td>236.9</td>
</tr>
</tbody>
</table>

Limitations: In a 3850 MSS configuration with one 3851 MSF (B-series) or two 3851 MSFs (A-series), both MSCs must be featured identically if complete backup is required. NOTE: On a 3860 Block Multiplexer Channel, Extended Unit Control Words (#3851, 3852) may be required to expand DASD device address capability. The 155 II SYSGEN configuration is restricted by the maximum number of non-shared block multiplexer subchannels (in groups of eight). See the Channel Section of the ‘Guide to IBM System/370 Model 155‘, GC20-1729 for description and number available. The total device addresses (real, virtual, non-existent, or non-Mass Storage System) SYSGENed may not exhaust the pool of non-shared UCWs.

PREREQUISITES: A control unit position on a S/370 or 4341 Processor byte or block multiplexer channel for each MSC -- one for each A-Series MSF, two for a B-Series MSF.

A minimum of one 3830 Storage Control mdl 3 on S/370 mdls 145, 145-3, 148, 155 II, 158, 165 II and 168, or a 3031, 3032, 3033 or 4341 Processor, or one Integrated Storage Controls (#4650) with the Staging Adapter (#7220) on S/370 mdls 158 and 168.

A minimum of either two 3333 Disk Storage Controls or two 3350 mdls A2/A2Fs. See Note on M 3333 pages for feature changes required when 3333 is a retained for use with a 3851.

Data Cartridges (IBM Part No. 2496971, Purchase Only) must be ordered separately.

Maximums: Attaches to a maximum of four S/370s (any combination of UPs, MPAs, APAs) or 3031, 3032, 3033 Processor Complexes.

A maximum of two 3851 MSFs from the A-series of models or one 3851 MSF from the B-series of models can be included in the 3850 Mass Storage System (MSS).

In a 3850 Mass Storage System (MSS) there is one active Mass Storage Control. It can address a total of eight 3850 MSS components: 3851 MSF control function, 3830 Storage Control mdl 3s, and Integrated Storage Controls (#4650) with the Staging Adapter (#7220) on S/370 mdls 158 and 168. (Each ISC counts as two components). The number of 3850 MSS components addressed can be increased to sixteen with installation of the MSC Twin Port Feature (#4901, 4902). A second Mass Storage Control (either a B-series or the second A-series) may be designated as an alternate control.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: The accent panels above and below the cartridge access station are red. The two end covers on the 3851 MSF are gray. The remainder of the 3851 is available in #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white. FIELD INSTALLATION: Yes.

[3] In a 3850 MSS configuration with two A-series MSFs, specify #9120 for the designated primary 3851 MSF and #9121 for the secondary 3851 MSF.

---

IBM DP Machines

IB M 3 8 5 1 M A S S S T O R A G E F A C I L I T Y

---

PRICES: Mdl MAC/ MRC 2 yr Purchase MMMC
3851 A1 $12,937 $11,010 $496,050 $1,540
A2 7304 $16,210 $735,000 $2,145
A3 25,157 $21,940 $964,050 $2,750
A4 31,267 $26,610 $1,198,050 $3,355
B1 16,979 $14,950 $651,000 $1,705
B2 23,069 $19,650 $885,000 $2,310
B3 29,199 $24,850 $1,199,050 $2,915
B4 35,309 $30,050 $1,353,000 $3,520

Plan Offering: Plan B Purchase Option: 5% Maintenance: D Warranty: B Useful Life Category: 2 Per Call: 3 Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

Model Changes: Field Installable.

MODEL UPDATE PURCHASE PRICES (there are no additional installation charges)

From To A2 A3 A4 B2 B3 B4
A1 ... $234,000 $468,000 $702,000 $154,950 $388,850 $622,950
A2 ... 234,000 $468,000 $702,000 $154,950 $388,850 $622,950
A3 ... 234,000 ... $154,950 $388,850 $622,950
A4 ... 234,000 ... $154,950 $388,850 $622,950
B1 ... ... ... ... 234,000 $468,000 $702,000
B2 ... ... ... ... 234,000 $468,000 $702,000
B3 ... ... ... ... 234,000 $468,000 $702,000

SPECIAL FEATURES:

Note: In a 3850 MSS configuration with one 3851 MSF (B-series) or two 3851 MSFs (A-series), both MSCs must be configured identically if complete backup is required.

MASS STORAGE CONTROL TWIN PORT (#4901, 4902).

#4901 for A and B mdls ... #4902 for B mdls only) #4901 applies to the A-series MSF and the first MSC in a B-series. #4902 applies to the second MSC in a B-series, and requires #4901 as a prerequisite. Permits the MSC to address B additional, for a total of 16, 3850 MSS components: 3851 MSF control functions*. See 3830 Storage Control mdls 3s on S/370 mdls 145, 145-3, 148, 155 II, 158, 165 II and 168, and 3031, 3032, 3033 or 4341 Processor, and the ISC (#4650) with the Staging Adapter (#7220) on S/370 mdls 158 and 168. Each ISC has two paths and counts as two components.

* In a 3850 MSS configuration with two A-series models there are 3851 MSF control function components.

REMOTE SWITCH ATTACHMENT (#6148).

For A and B mdls To control the two-channel interfaces on the basic 3851 MSF from a remote configuration control panel. Also controls the Two Channel Switch, Add'L (#8171) if installed. For B models, this feature is associated with the primary MSC and must be installed in addition to #6150 below, which is associated with the alternate MSC.

REMOTE SWITCH ATTACHMENT (#6150).

For B mdls only To control the two-channel interfaces on the basic 3851 (alternate MSC) from a remote configuration control panel. Also controls the Two Channel Switch, Add'L (#8171) if installed. Field Installation: Yes. Prerequisite: Remote Switch Attachment (#6148).

TWO CHANNEL SWITCH, ADD'L (#8171).

For A and B mdls Permits attachment to two additional S/370 or 4341 Processor channels, providing a total of four S/370 or 4341 channel attachments. The channels can be on the same or different CPUs, to a maximum of four CPUs with no more than two channels to a single CPU. For B mdls, the feature is associated with the active MSC and must be installed in addition to #6172 below, which is associated with the alternate MSC. Field Installation: Yes.

TWO CHANNEL SWITCH, ADD'L (#8172).

For B mdls only Permits attachment to two additional S/370 or 4341 Processor channels, providing a total of four S/370 or 4341 channel attachments. The channels may be on the same or different CPUs, to a maximum of four CPUs with no more than two channels to a single CPU. Field Installation: Yes. Prerequisite: Two Channel Switch, Add'L (#8171).

Special Feature Prices: Mdl MAC/ MRC 2 yr Purchase MMMC
Mass Storage Twin Port #4901 $159 $6,235 $2.00
Mass Storage Twin Port #4902 159 $6,235 $2.00
Remote Switch Attach 6148 NC NC NC
Remote Switch Attach 6171 NC NC NC
Two Channel Sw, Add'L 8171 402 342 15,590 6.00*
Two Channel Sw, Add'L 8172 402 342 15,590 6.00*
IBM 3863 MODEM

Purposes: A 2400 bps modem used to provide communication products with a means for transmitting data over telecommunication channels (normally telephone lines).

This advanced microprocessor-based modem significantly enhances communication network management and network problem determination.

The modem diagnostic functions operate with Network Problem Determination Application (NPDA) Release 2 providing:

• Probable cause of network errors
• Alert messages on error threshold
• Formatted modem test results

Models

• Model 1 Operates in half-duplex or duplex mode over 4-wire non-switched duplex facilities. Operates in point-to-point, multipoint control, or multipoint tributary mode.

• Model 2 Operates in half-duplex mode over 2-wire switched telecommunication networks. Operating mode is point-to-point.

Model Changes: Available at time of manufacture only.

Highlights - Standard Features

• A microprocessor for signal processing.
• Auto-answer — automatic answering of switched network calls... model 2, or model 1 with SNU special feature.
• Automatic Remote Speed Selection - the transmission speed of the remote modem follows the transmission speed (2400/1200 bps) of the local modem.
• Anti-Streaming - a multipoint tributary modem can automatically cut off transmission if a terminal holds “Request to Send,” up longer than 40 seconds (an abnormal condition in IBM communication protocol). Customer switch option.
• Automatic and Adaptive Equalization - equalization is automatically performed by the modem and continues to adapt in data mode.
• Line conditioning is not required.
• The protective circuits required for FCC registration in the U.S. are built into the 3863 modems to allow direct attachment to Public Switched Network (conditional upon FCC registration).
• Operator panel with operational status indicators and data quality (Good, Poor) indications.
• The modem diagnostic functions referred to as Link Problem Determination Aid (LPDA), operate with System Network Architecture (SNA) and associated program products. Under control of these programs the modem accepts commands and initiates tests that help isolate problems to the line, local or remote modem, or elsewhere in the network and provide the network operator with the most probable cause of network problems. These program products are:
  1. Network Communication Control Facility (NCCF) Release 1 - (PP 5735-XX8)
  2. Network Problem Determination Application (NPDA) Release 2 - (PP 5735-XX6)
  3. AF/CNP Release 2.1 - (PP 5735-XX1)

  • Provides its own clocking or will accept DTE (external) clocking.

Highlights - Optional Features ... see "Special Features" and "Accessories." 4-wire Switched Network Backup (SNBU), special feature available on model 1, provides backup for point-to-point or multipoint non-switched telecommunication facilities.

Fan Out - this special feature available on model 1 allows attachment of up to three teleprocessing machines to one 3863 model 1.

• Rack Mount Adapters (Accessories) are available.

Tail Circuit Attachment - this accessory allows a 3863 model 1 to attach to a 3865 Modem equipped with Data Multiplexer (#3260).

Extended Diagnostic Card - this special feature available on model 1 monitors remote modem power loss. When used with NPDA, it expands the problem determination capability. See IBM Program Product 5735-XX8.

Data Rate: 2400 bps with back-up of 1200 bps (half speed).

Link Problem Determination Aid Diagnostic Tests: All modems will respond to diagnostic commands from the system that help provide the status of any modem in the link, its attached terminal, and the quality of the received signal over the communication facility. Test requests and responses utilize the same data path and controls that are used by the S/370 or 4300 processor for data transmission. Thus diagnostic status/test requests can be interspersed with data requests without interrupting terminal sessions.

The Network Problem Determination Application (NPDA) program product provides functions for the collection, storage, and retrieval of network error/management data. NPDA implemented under the Network Communication Control Facility (NCCF) program product has both summary and detailed level information for determining probable cause of network errors. Probable cause differentiates between errors in the communications controller, line, modem, modem interface, or terminals. NPDA will also utilize the new modem facilities to provide alert messages on error threshold and display formatted modem test results.

In addition, tests can also be executed from the modem operator panel. These manual tests include:

• Modem Self-Test - this includes an extensive test of modem microcode, plus a data wrap with reduced thresholds for receive.

• Modem/Line Transmit and Receive Tests - allows testing of modem and line for switched network.

Local Loop-back Test - provides a "wrap" or loop-back at the line interface to allow terminal wrap tests through the modem.

Remote Loop-Back Test - provides a "wrap" or loop-back at the remote modem to allow a DTE wrap test back through the local modem for non-switched modems. This test does not require remote operator assistance.

Loop Test - allows an end-to-end test to any modem on the link without remote operator assistance. This test is only available when operating over 4-wire telecommunication facilities.

Lamp Test - tests all indicator lights on the operator panel.

Customer Setup: The 3863 is designated for Customer Setup (CSU). This provides the customer with early availability and allows relocation of the unit without requiring IBM service personnel assistance. All switches will be set at the plant from the customer order information. Switched network transmit level switches will not be accessible to customers.

Customer accessible "Setup Switches" are provided on the rear panel to allow reconfiguration of the modem where application needs change. For example, 3863 model 1s may be set for point to point, multipoint control, or multipoint tributary operation via the setup switches. NOTE: Some of these changes may require SYSGEN changes in the program support.

Communications Facilities

Common Carrier Provided Facilities: Voiceband private line (non-switched) channel, type 3002 (or equivalent) as described in the Bell System Technical Reference PUB 41004, dated October 1973.

Privately Owned Communication Facilities: Equivalent to above.

International Facilities: Request your TP coordinator to contact TP coordinators of the other countries involved to determine the availability of such facilities. Transmission of data between the United States and Canada on non-switched or switched facilities is supported. (For non-switched operation, the channel in Canada must be schedule 4, type 4.)

Attachment to Facilities

Attachment to a private line (non-switched) channel is by a cable, supplied with the 3863, which is terminated with a four prong plug (WE 2338 or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communications equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3863 mdd 1 is equipped with 4-wire Switched Network Backup (#7903), two of the following switched cables are also provided with the 3863. Attachment to a switched line channel is by a cable supplied with the 3863, which is terminated with an 8 pin mini plug (USOC 453 or 413) for insertion into the customer provided data jack provided by the telecommunication service supplier.

In the case of either Switched Network or Switched Network Backup, the modem includes a protective coupler (conditioned upon FCC Registration) which permits direct attachment to the U. S. Public Switched Network.

Related Equipment: The 3863 operates with IBM communication

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3863 Modem (cont’d)

3863 User’s Guide - available with shipment.

SPECIFY:

- Voltage: (120 V AC, 1-phase, 3-wire, 60 Hz): #9990 for locking plug. If standard 10 ft. (3.0 meter) power cable is not required, specify #9988 for 6 ft (1.8 meter) cable.

- Telecommunication Cord (modem to telecommunication line) 10 feet (3 meters), specify #9710 25 feet (7.5 meters), specify #9713

- Related Equipment: one 3863 Attachment Feature Code from the table below must be specified for each 3863, depending upon the unit to be attached.

<table>
<thead>
<tr>
<th>Machine Feature #</th>
<th>Machine Feature #</th>
</tr>
</thead>
<tbody>
<tr>
<td>2701</td>
<td>9505</td>
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<tr>
<td>3115</td>
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<td>9526</td>
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<tr>
<td>2803</td>
<td>9526</td>
</tr>
</tbody>
</table>

- Operational Mode - required for 3863 model 1s so that the modem can be shipped from the plant ready to install. Selection of one of these codes determines the network operational mode of the modem. It also determines how the automatic data rate control feature in the modem will function. The two designations for automatic data rate control are:

  - Local Speed Control - signifies that modem data rate can only be changed by the "Full Speed/ Half Speed" switch on the operator panel, or at the rate selected by its attached DTE through its control of the "Data Rate Select" interface lead to the modem.
  - Remote Speed Control - signifies that the modem will ignore its operator panel or interface data rate control setting and will automatically adjust its data rate to the rate it is receiving data over the telecommunication line.

The two operational modes are available to point to point and multipoint.

Point to point - this configuration has two modems connected at each end of a telecommunication link. One must be specified as LOCAL, the other as REMOTE.

Multipoint - this configuration has several modems connected together. One modem is called the "Control Station" and broadcasts data to all other modems called "Subordinate Stations" through "Polling" techniques. The system must control transmission requests to tributary modems to ensure that only one tributary transmits at a time.

Operational Mode Select Option Codes for 3863 Modem mdl 1s (must select one):

- Multipoint Control - specify #9320. Selects modem for operation as control station in a multipoint network. Modem is also set to "Local Speed Control.
- Multipoint Subordinate - specify #9321. Selects modem for operation as tributary station in a multipoint network. Modem is also set to "Remote Speed Control.

- Point to Point, Local - specify #9322. Selects modem for point to point operation and "Local Speed Control.

- Point to Point, Remote - specify #9323. Selects modem for point to point operation and "Remote Speed Control.

Note: The operational mode can be changed by switch control.

PRICES Mdl 1 MRC 2 Year Purchase MMC
3863 $71 $60 $2,135 $11.50
2 76 65 2,335 14.00

Plan Offering: Plan D Machine Group: D
Warranty: B Per Call: 1
Purchase Option: 55% Useful Life Category: 2
Termination Charge Percent: 25% Termination Charge Months: 5
Upper Limit Percent: 5%
Initial Period of Maintenance Service Availability: 3 mos.

SPECIAL FEATURES

FAN-OATD (#3901). [Mdl 1 only] Allows attachment of up to three multiprocessing machines to one 3863 modem model 1. See "Related Equipment" under "Specify" for applicable machines. Only one of the attached machines may transmit at a time. This feature may be used at a tributary station in a centralized multipoint network. In this configuration, multipoint programming discipline will provide the selection/control of the specified IBM terminal without any additional user involvement. This feature may also be used to allow up to three of the specified IBM Multiplexers, or Communications Controllers, at a central site to share the same 3863 modem 1 for backup purposes. In this case, all of the machines attached to the 3863 will receive the incoming data simultaneously, the user switchover procedure must ensure that only one machine is sending. Limitation: Cannot be installed with DTE (external) clocking. Field Installation: Yes.

EXTENDED DIAGNOSTIC CARD (#7930). [Mdl 1 only] Used to give a remote modem power loss indication, which is reported to NPDIA in a 5/370 or 4300 processor. The feature must be installed in the local and remote modems. The feature card in the remote modem detects the loss of DC power and signals via an out-of-band tone to the local feature card. Prerequisites: #7930 must be installed in both the local and remote modems ... also see LPDA in "Highlights" for required Program Product support. Field Installation: Yes.

4-WIRE SWITCHED NETWORK BACKUP (4W-SNUB) (#7953). [Mdl 1 only] Available for all 3863 modems (non-switched line) modems. Provides backup for the non-switched telecommunication features. Data rate in 4W-SNUB mode is the same as in normal non-switched line mode. 4W-SNUB allows restoration of the 4-wire service between two point to point or multipoint 3863s. For point
to point configurations, except for the requirement to establish the switched connections. 4W-SNBU allows continuation of service with no operational or programming impact. For multipoint configurations, operational (and possibly programming) modifications are required. 4W-SNBU can be configured in two ways:

- The 4W-SNBU feature is installed on the normal multipoint control station modem and on any tributary modems that require backup. To establish a backup path to any tributary, the control station modem must go to SNBU mode. In doing so, communication is broken to all other tributaries.

- A spare control station modem equipped with the 4W-SNBU feature is installed on a spare port at the control station location. The spare control station can then establish a 4W-SNBU connection to any 3863 tributary modem equipped with the 4W-SNBU feature. This tributary is deactivated from its normal polling list and assigned to the spare port. The normal control station continues to provide service to other tributaries still reachable over the non-switched line.

This feature requires two 2-wire "switched" telephone lines, and two telephones at the host site. Attachment to the switched lines is made as described in the "Attachment to Facilities" section above. This feature is designed to automatically answer when a call is received. Calls must be placed manually. When one call is placed and the connection is completed a four minute timer is started. The second line must be established within the time-out, otherwise the first line is automatically dropped. Field Installation: Yes.

**ACCESSORIES**

The following items are available on a purchase only basis. Order the Feature # indicated below.

**RACK MOUNT ADAPTER (#6240).** A rack adapter that fastens inside a standard 19 inch EIA rack. The adapter is a shelf with an inside width of 17-3/8 inches (441.3 mm) which will allow two standalone modems to be placed side by side. The adapter will fit racks with depths of 23-5/8 to 30 inches (600 to 760 mm). Field Installation: Yes.

**TAIL CIRCUIT ATTACHMENT (TCA)(#7875).** [Mdl 1 only] Allows the 3863 model 1 to attach to a 3865 Modem model 1 (9600 bps) equipped with Data Multiplexer (#3260). Permits an extension of a network via a separate set of modems and a separate communications channel. Limitations: No LPDA support available on tailed attachments ... 3863 model 1 is in point to point or multipoint control mode only. Field Installation: Yes.

### Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC 2 Yr</th>
<th>Purchase</th>
<th>MMC</th>
<th>MLC/</th>
</tr>
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<tr>
<td>Fan Out</td>
<td>#3901 $24</td>
<td>$20</td>
<td>$750</td>
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<td>Ext Diagnostic Card</td>
<td>7930 9</td>
<td>8</td>
<td>275</td>
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<td>4-Wire SNBU</td>
<td>7953 38</td>
<td>32</td>
<td>1,110</td>
<td>9.00</td>
</tr>
</tbody>
</table>

### Rack Mount Adapter 

#6240 $70

### Tail Circuit Attachment 

7875 45
IBM 3864 MODEM

Purpose: A 4800 bps modem used to provide communication products with a means for transmitting data over telecommunication channels (normally telephone lines).

An advanced microprocessor-based modem which significantly enhances communication network management and network problem determination.

The modem diagnostic functions operate with Network Problem Determination Application (NPDA) Release 2, providing:

- Probable cause of network errors.
- Alert messages on error threshold.
- Formatted modem test results.

Models

Model 1 Operates in half-duplex or duplex mode over 4-wire non-switched duplex facilities. Operates in point-to-point, multipoint control, or multipoint tributary mode.

Model 2 Operates in half-duplex mode over 2-wire switched telecommunication networks. Operating mode is point-to-point.

Model Changes: Available at time of manufacture only.

Highlights - Standard Features

- A microprocessor for signal processing.
- Auto Answer - automatic answering of switched network calls - model 2, or a model 1 equipped with SNBU special feature.
- Automatic Remote Speed Select - the transmission speed of the remote modem follows the transmission speed (4800/2400 bps) of the local modem.
- Anti-Streaming - a multipoint tributary modem can automatically cut off transmission if a terminal holds "Request to Send" up longer than 40 seconds (an abnormal condition in IBM communication protocol). Customer switch option.
- Automatic and/Adaptive Equalization - equalization is automatically performed by the modem and continues to adapt to communication protocol. Customer switch option.

The modem diagnostic functions referred to as Link Problem Determination Aid (LPDA), operate with System Network Architecture (SNA) and associated program products. Under control of these programs the modem accepts commands and initiates tests that help isolate problems to the line, local or remote modem, or elsewhere in the network and provide the network operator with the most probable cause of network problems. These program products are:

1. Network Communication Control Facility (NCCF) Release 2 - (PP 5735-XX6)
2. Network Problem Determination Application (NPDA) Release 2 - (PP 5735-XX8)
3. ACF/NCP Release 2.1 - (PP 5735-XX1)

Model Changes: Available at time of manufacture only.

Highlights - Optional ... see "Special Features" and "Accessories."

- 4-wire Switched Network Backup (SNBU), special feature on model 1, provides backup for point to point, or multipoint non-switched telecommunication facilities.
- Fan Out - this special feature on model 1 allows attachment of up to three IBM teleprocessing machines to one 3864 model 1.
- Rack Mount Adapters (Accessories) are available.
- Tail Circuit Attachment - this accessory allows a 3864 model 1 to attach to a 3865 Modem equipped with Data Multiplexer (#3260).
- Extended Diagnostic Card - this special feature, available on 3864 model 1, indicates remote modem power loss. When used with NPDA expands the problem determination capability. See IBM Program Product 5735-XX8.

Data Rate: 4800 bps with back-up of 2400 bps (half speed).

Link Problem Determination Aid Diagnostic Tests: All modems will respond to diagnostic commands from the system which help provide status of any modem in the link, its attached terminal, and the quality of the received signal over the communication facility. Test requests and responses use the same data path and controls that are used by the S/370 or 4300 Processor for data transmission. Thus diagnostic status/test requests can be interspersed with data requests without interrupting terminal sessions.

The Network Problem Determination Application (NPDA) program product provides functions for the collection, storage and retrieval of network error/management data. NPDA implemented under the Network Communication Control Facility (NCCF) program product has been summarized and detailed level information for determining probable cause of network errors. Probable cause differentiates between errors in the communications controller, line, modem, modem interface or terminals.

NPDA will also utilize the new modem facilities to provide alert messages on error threshold and display formatted modem test results. In addition, tests can also be executed from the modem operator panel. These manual tests include:

- Modem Self Test - includes an extensive test of modem microcode, plus a data wrap with reduced thresholds for received data.
- Modem/Line Transmit and Receive Tests - allow testing of modem and line for a switched network.
- Local Loop-back Test - provides a "wrap" or loop-back at the line interface to allow terminal wrap tests through the modem.
- Remote Loop-back Test - provides a "wrap" or loop-back at the remote modem to allow a DTE wrap test back through the local modem for non-switched modems. This test does not require remote operator assistance.
- Loop Test - allows an end-to-end test to any modem on the link without remote operator assistance. This test is only available when operating over 4-wire telecommunication facilities.
- Lamp Test - tests all the indicator lights on the operator panel.

Customer Setup: The 3864 is designated for Customer Setup (CSU). This provides the customer with early availability and allows relocation of the unit without requiring IBM service personnel assistance. All switches will be set at the plant from customer order information. Switched network transmit level switches will not be accessible to customers.

Customer accessible "Setup Switches" are provided on the rear panel to allow reconfiguration of the modem where application needs change. For example, 3864 model 1s may be set for point to point, multipoint control, or multipoint tributary operation via the setup switches. NOTE: Some of these changes may require SYS-GEN changes in the program support.

Communication Facilities

Common Carrier Provided Facilities: Voiceband private line (non-switched) channel, type 3002 (or equivalent) as described in the Bell System Technical Reference PUB 41004, dated October 1973.

Privately Owned Communication Facilities: Equivalent to above.

International Facilities: Request your TP coordinator to contact TP coordinators of the other countries involved to determine the availability of such facilities. Transmission of data between the United States and Canada on non-switched or switched facilities is supported. (For non-switched operation, the channel in Canada must be schedule 4, type 4.)

Attachment to Facilities

Attachment to a private line (non-switched) channel is by a cable, supplied with the 3864, which is terminated with a four prong plug (WE 253B or equivalent). The plug mates with a receptacle (WE 4046 or 546A surface mount or 493A flush mount, or equivalent) which is connected to the channel. The receptacle is a conventional item of communications equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.

If the 3864 model 1 is equipped with 4-Wire Switched Network Backup (#7953), two additional switched cables are also provided with that modem. Attachment to a switched line channel is by a cable supplied with the 3864, which is terminated with an 8 pin mini plug (USOC 45S or 41S) for insertion into the programmed data jack provided by the telecommunication service supplier.

In the case of either Switched Network or Switched Network Backup, the modem includes a protective coupler (conditioned upon FCC Registration) which permits direct attachment to the US Public Switched Network.

Not to be reproduced without written permission.
3864 Modem
(cont'd)

Related Equipment: The 3864 operates with IBM communication products capable of 4800 bps operation. See "Related Equipment" under "Specify." The 3864 must communicate with another appropriately configured 3864. The interconnecting cable between the machine and the modem must be supplied by the using machine.


The customer is also responsible for:
1) Arrangement for price quotations, installation, and all costs of carrier equipment and services.
2) Private line (non-switched) channel — arranging for the telecommunications service supplier to provide a voice grade data channel. Also arranging for installation of the appropriate receptacle described in "Attachment to Facilities" above.
3) Switched Telecommunication Network — arranging for the telecommunication service supplier to install the appropriate communication service equipment with the required connecting device as described in "Attachment to Facilities" above, and for attaching the IBM provided cable to the connecting device.
4) If the 3864 is to be attached to a non-IBM product, the interconnecting cable between the business machine and the modem must be supplied by the business machine.
5) Unpacking and placing of the 3864. Physical setup, and connection of cables at setup time.
6) Notifying IBM of intent to relocate the unit, and for following IBM instructions for relocation.
7) Disconnecting, packing and removal to the customer's shipping dock at time of discontinuance. Appropriate instructions will be supplied by IBM.

8) All three of the following Program Products must be installed for LPDA to function.
   1. NCCF Release 1 (PP 5735-XX6)
   2. NPDA Release 2 (PP 5735-XX8)
   3. ACF/NCP Release 2.1 (PP 5735-XX1)

Bibliography: See KWIC Index G320-1621 or specific systems bibliography.

Publications:
   • IBM 3863, 3864 and 3865 Introduction and Site Preparation Guide, GA27-3200.
   • IBM 3864 Users Guide - available with shipment.

Specify:
   • Voltage (120 VAC, 1-phase, 3-wire, 60 Hz): Specify #9890 for locking plug, or #9891 for non-lock plug. If standard 10 ft (3 meter) power cable is not required, specify #9986 for 6 ft (1.8 meter) cable.
   • Telecommunication Cord (modem to telecommunication line) 10 feet (3 meters), specify #9710.
   25 feet (7.6 meters), specify #9713.
   • Related Equipment: one 3864 Attachment Feature Code from the table below must be specified for each 3864, depending upon the unit to which it is attached.

<table>
<thead>
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<th>Machine Feature #</th>
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</table>

• Operational Mode: [3864 model 1 only] Required so that the modem can be shipped from the plant ready to install. Selection of one of these codes determines the network operational mode of the modem. It also determines how the automatic data rate control feature in the modem will function. The two designations for automatic data rate control are:

Local Speed Control - signifies that modem data rate can only be changed by the "Full Speed/Half Speed" switch on the operator panel, or at the rate selected by its attached DTE through its control of the "Data Rate Select" interface lead to the modem.

Remote Speed Control - signifies that the modem will ignore its operator panel or interface data rate control setting and will automatically adjust its data rate to the rate it is receiving data over the telecommunication line.

The two operational modes available are point to point and multi-point.

Point to Point - this configuration has two modems connected at each end of a telecommunication line. One modem must be specified as LOCAL and the other as REMOTE.

Multipoint - this configuration has several modems connected together. One modem is called the "Control Station" and broadcasts data to all other modems called "Tributary Stations." Through "Polling" techniques, the system must control transmission requests to tributary modems to ensure that only one tributary transmits at a time.

Operational Mode Select Option Codes for 3864 Modem mdl 1s (must select one):
- Multipoint Control — Specify #9320. Selects modem for operation as a control station in a multipoint network. Modem is also set to "Local Speed Control."
- Multipoint Tributary — Specify #9321. Selects modem for operation as a tributary station in a multipoint network. Modem is also set to "Remote Speed Control."
- Point to Point, Local — Specify #9322. Selects modem for point to point operation and "Local Speed Control."
- Point to Point, Remote — Specify #9323. Selects modem for point to point operation and "Remote Speed Control."

Note: The operational mode can be changed by switch selection.

PRICES

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Plan Offering: Plan D Machine Group: D
Warranty: B Per Call: 1
Purchase Option: 55% Use 110 Termination Charge Percent: 25% Termination Charge Months: 5
Upper Limit Percent: 5%
Initial Period of Maintenance Service Availability: 3 mos.

SPECIAL FEATURES

FAN-OUT (#3001). [Mdl 1 only] Allows attachment of up to three teleprocessing machines to one 3864 mdl 1. See "Related Equipment" under "Specify" for applicable machines. Only one of the attached machines may transmit at a time. This feature may be used at a tributary station in a centralized multipoint network. In this configuration, multipoint programming discipline will provide the selection/control of the specified IBM terminals without any additional user involvement.

This feature may also be used to allow up to three of the specified IBM Multiplexers, or Communications Controllers, at a central site to share the same 3864 mdl 1 for backup purposes. In this case, although all of the machines attached to the 3864 will receive the incoming data simultaneously, the user switchover procedure must ensure that only one machine is sending. Limitation: Cannot be installed with DTE (external) clocking. Field Installation: Yes.

EXTENDED DIAGNOSTIC CARD (#7930). [Mdl 1 only] Used to give a remote modem power loss indication, which is reported to a NPDA in a 370/370 or 4300 processor. The feature must be installed on the local and remote modems. The feature card in the remote modem detects the loss of DC power and signals it with an "out-of-bond" tone to the local feature card. Prerequisites: #3790 must be installed in both the local and remote modems. Also see NPDA in "Highlights" for required Program Product support. Field Installation: Yes.

4-WIRE SWITCHED NETWORK BACKUP (4W-SNBU) (#7953). [Mdl 1 only] Available on all multipoint line modems. Provides backup for the non-switched telecommunication facility. Data rate in 4W-SNBU mode is the same as in normal non-switched line mode. 4W-SNBU allows restoration of the 4-wire service between two point to point or multipoint 3864s. For point to point configurations, except for the requirement to establish the switched connections, 4W-SNBU allows continuation of service with no operational or programming impact.
3864 Modem (cont'd)

For multipoint configurations, operational (and possibly programming) modifications are required. 4W-SNBU can be configured in two ways:

- The 4W-SNBU feature is installed on the normal multipoint control station modem and on any tributary modems that require backup. To establish a backup path to any tributary, the control station modem must go to SNBU mode. In doing so, communication is broken to all other tributaries.

- A spare control station modem equipped with the 4W-SNBU feature is installed on a spare port at the control station location. The spare control station can then establish a 4W-SNBU connection to any 3864 tributary modem equipped with the 4W-SNBU feature. This tributary is deactivated from its normal polling list and assigned to the spare port. The normal control station continues to provide service to other tributaries still reachable over the non-switched line.

This feature requires two 2-wire "switched" telephone lines, and two telephones at the host site. Attachment to the switched lines is made as described in the "Attachment to Facilities" section above. The feature is designed to automatically answer when a call is received. Calls must be placed manually. When one call is placed and the connection completed, a four minute timer is started. The second line must be established within the timeout, otherwise the first line is automatically dropped. Field Installation: Yes.

| MLC/ | Special Feature Prices: | MRC | 2 Yr | Purchase | MMC
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</table>

ACCESSORIES

The following items are available on a purchase only basis. Order the Feature # indicated below.

RACK MOUNT ADAPTER (#6240). A rack adapter that fastens inside a standard 19 inch EIA rack. The adapter is a shelf with an inside width of 17-3/8 inches (441.3 mm) which will allow two standalone modems to be placed side by side. The adapter will fit racks with depths of 23-5/8 to 30 inches (600 to 760 mm). Field Installation: Yes.

TAIL CIRCUIT ATTACHMENT (TCA) (#7875). [Mdl 1 only] Allows the 3864 mdl 1 to attach to a 3865 Modem mdl 1 (9600 bps) equipped with Data Multiplexing (#3260). Permits an extension of a network via a separate set of modems and a separate communications channel. Limitations: No LPDA support on tailed circuit attachments. 3864 mdl 1s in point to point or multipoint control mode only. Field Installation: Yes.

| Rack Mount Adapter | #6240 | $70 |
| Tail Circuit Attachment | 7875 | 45 |
IBM 3865 MODEM

Purpose: A 9600 bps modem used to provide communication products with a means for transmitting data over telecommunication channels (normally telephone lines).

An advanced microprocessor-based modem which significantly enhances communication network management and network problem determination.

The modem diagnostic functions operate with Network Problem Determination Application (NPDA) Release 2, providing:

- Probable cause of network errors.
- Alert messages on error threshold.
- Formatted modem test results.

Operation: The 3865 operates in half-duplex or duplex mode over 4-wire non-switched duplex facilities.

Model 1 Operates in point-to-point mode.
Model 2 Operates in multipoint mode and can be configured as a multipoint control or as a multipoint tributary station.

Model Changes: Available at time of manufacture only.

Highlights - Standard Features

- A microprocessor for signal processing.
- Automatic Remote Speed Selection - the transmission speed of the remote modem follows the transmission speed (9600/4800 bps) of the local modem (primary status). The network configuration of the remote modem must be secondary.
- Anti-Streaming - a multipoint tributary 3865 mdi 2 can automatically cut off transmission if a terminal holds "Request to Send" for longer than 30 seconds (an abnormal condition in IBM communication protocol). Customer switch option.
- Automatic and Adaptive Equalization - equalization is automatically performed by the modem and continues to adapt in data mode.
- Operator Panel with operational status and data quality (Good, Poor) indications.
- The modem diagnostics referred to as Link Problem Determination Aid (LPDA) operate with Systems Network Architecture (SNA) and associated program products. Under control of these programs, the modems accept commands and initiate tests that can help isolate problems to the line, local or remote modem, or elsewhere in the network and provide the network operator with the most probable cause of network problems. These program products are:

  1. Network Communication Control Facility (NCCF) Release 1 - (PP 5735-XX6)
  2. Network Problem Determination Application (NPDA) Release 2 - (PP 5735-XX6)
  3. ACF/NCP Release 2.1 - (PP 5735-X11)
- Modem provides its own clocking or will accept DTE (external) clocking.
- Fast RFS - 24 millisecond Ready For Sending (RFS) Delay available for 3865 multipoint tributary modems. Customer switch option (24 msec or 60 msecs).
- Both point to point and multipoint can operate over 3002 Basic (unconditioned) channels.
- Protective circuits required for FCC Registration in U.S. when 4-Wire SNBU (879565) is installed are built into the 3865 modem (conditional upon FCC Registration).

Highlights - Optional ... see "Special Features" and "Accessories."

- 4-wire Switched Network Backup (SNBU) a special feature which provides for non-switched telecommunications facility.
- Fan Out - this special feature allows attachment of up to three teleprocessing machines to one modem.
- Rack Mount Adapters (Accessories) are available.
- Extended Diagnostic Card - a special feature which indicates remote modem power loss. Used with NPDA, it expands the problem determination capability. See IBM Program Product 5735-XX9.
- Data Multiplexing - a special feature available on the model 1 which allows selection of 4800 and 2400 bps subchannels. The modem multiplexes subchannel data into a single aggregate data stream on 3865 mdi 1a.
- Auto Answer - automatic answering of switched network calls with SNBU.

Data Rate: 9600 bps with back-up of 4800 bps (half speed).

Link Problem Determination Aid Diagnostic Tests: All modems will respond to diagnostic commands from the system that help provide status of any modem in the link, its attached terminal, and the quality of the received signal over the communication facility. Test requests and responses utilize the same data path and controls that are used by the S/370 or 4300 processor for data transmission. Thus diagnostic status/test requests can be interspersed with data requests without interrupting terminal sessions.

The Network Problem Determination Application (NPDA) program product provides functions for the collection, storage, and retrieval of network error/management data. NPDA implemented under the Network Communication Control Facility (NCCF) program product has both summary and detailed level information for determining probable cause of network errors. Probable cause differentiates between errors in the communications controller, line, modem, modem interface, or terminals.

NPDA will also utilize the new modem facilities to provide alert messages on error threshold and display formatted modem test results.

In addition, tests can be executed from the modem operator panel. These manual tests include:

- Modem Self Test - this includes an extensive test of modem microcode, plus a data wrap with reduced thresholds for received data.
- Modem/Line Transmit and Receive Tests - allow testing of modem and line for switched network.
- Local Loop-back Test - provides a "wrap" or loop-back at the line interface to allow terminal wrap tests through the modem.
- Remote Loop-back Test - provides a "wrap" or loop-back at the remote modem to allow a DTE wrap test for the normal modem for non-switched modems. This test does not require remote operator assistance.
- Loop Test - allows an end-to-end test to any modem on the link without remote operator assistance. This test is only available when operating over 4-wire telecommunication facilities.
- Lamp Test - tests all the indicator lights on the operator panel.

Link Problem Determination Application (LPDA) Diagnostic Tests - all 3865 modems will respond to diagnostic commands from the system to provide the status of any modem in the link, its attached terminal, or the quality of the received signal over the communication facility. Test requests and responses utilize the same data path and controls that are used by S/370 and 4300 processors for data transmission. Thus diagnostic status/test requests can be interspersed with data requests without interrupting terminal sessions. See LPDA in "Highlights" for required 5/370 Program Product support.

Customer Setup: The 3865 is designated for Customer Setup (CSU). This provides the customer with early availability and also allows relocation of the unit without requiring IBM service personnel assistance. All switches will be set at the plant from customer order information. Switched network transmit level switches will not be accessible to customers.

"Setup Switches" are provided on the rear panel to allow reconfiguration of the modem where application needs change. For example, 3865 mdi 2s may be set for multipoint control, or multipoint tributary operation via the setup switches. NOTE: Some of these changes may require SYSGEN changes in the program support.

Communications Facilities

Common Carrier Facilities: Voiceband private line (non-switched) channel, type 3002 (or equivalent), as described in the Bell System Technical Reference PUB 41004, dated October 1973.

Model 1 (point to point) and model 2 (multipoint) use basic channels. The 3865 will operate on most unconditioned lines and provide satisfactory error rates. However, due to the wide range of line impairments allowed for unconditioned lines, it may be necessary to add to some lines the following line conditioning to achieve satisfactory performance at 9600 bps:

- Model 1 (point to point) may require D1 conditioning.
- Model 2 (multipoint) may require C1 and/or, in extreme cases, D2 conditioning. An alternate that is effective in most cases is to activate a longer (80 ms) RFS delay on tributary modems with a switch on the back panel. NOTE: Model 2 modems can operate on links with a mix of 24 ms and 60 ms RFS delays. In exceptional cases, even with 60 ms RFS it may require D2 conditioning to achieve acceptable performance at 9600 bps.

Privately Owned Communication Facilities: Equivalent to above.

International Facilities: Request your TP coordinator to contact the TP coordinators of the other countries involved to determine
3865 Modem (cont'd)
the availability of such facilities. Transmission of data between the
United States and Canada on non-switched facilities is sup-
ported. (For non-switched operation, the channel in Canada must be
a schedule 4, type 4.)
Attachment to Facilities
Attachment to a private line (non-switched) channel is by a cable,
supplied with the 3865, which is terminated with a four prong plug (WE 263B or equivalent). The plug mates with a receptacle
(WE 404B or 549A surface mount or 493A flush mount, or equi-
valent) which is connected to the channel. (The receptacle is a
conventional item of communications equipment and is, upon
customer request, ordinarily furnished by the telecommunication
service supplier.)
If the 3865 is equipped with 4-wire Switched Network Backup
(#7953) two additional switched cables are also provided with
that modem. Attachment to a switched line channel is by a cable
supplied with the 3865, which is terminated with an 8 pin mini
plug (USOC 455 or 415) for insertion into the programmed data jack
provided by the telecommunication service supplier.
When equipped with the 4-wire SNBU feature (#7953) the mo-
dem includes a protective coupler (conditional upon FCC Regis-
tration) which permits direct attachment to the U.S. Public
Switched Network.
Related Equipment: The 3865 operates with IBM communication
capable of 9600 bps. See "Related Equipment" under "Specify." The 3865 must communicate with another appropriately configured 3865 unless multiplexing is used. The interconnecting cable between the machine and the modem
must be supplied by the using machine.
Customer Responsibilities: The customer must be informed of his/her responsibilities as detailed in the M 2700 sales manual,
The customer is also responsible for:
1) Arrangements for price quotations, installation, and all costs of
common carrier equipment and services.
2) Private Line (non-switched) Channel -- arranging for the tele-
communication service supplier to provide a voice grade data
channel. Also arranging for the installation of the appropriate
receptacle described in "Attachment to Facilities" above.
3) Switched Telecommunication Network -- arranging for the tele-
communication service supplier to install the appropriate
communication service equipped with the required connecting
device as described in "Attachment to Facilities" above and
for attaching the IBM provided cable to the connecting device.
4) If the 3865 is to be attached to a non-IBM product, the inter-
connecting cable between the business machine and the mo-
dem must be supplied by the business machine.
5) Unpacking and placing of the 3865. Physical setup and con-
nexion of cables at setup time.
6) Notifying IBM of intent to relocate the unit, and for following
IBM instructions for relocation.
7) Disconnecting, packing and removal to the customer's ship-
ing dock at time of discontinuance. Appropriate instructions
will be supplied by IBM.
8) All three of the following Program Products must be installed
for LPDA to function.
1. NCCF Release 1 (PP 5735-XX6)
2. NPDA Release 2 (PP 5735-XX8)
3. ACF/NCP Release 2.1 (PP 5735-XX1)
Bibliography: See KWIC Index G320-1621 or specific systems
bibliography.
Publications:
* IBM 3863, 3864 and 3865 Introduction and Site Preparation
Guide, GA 27-3200

SPECIFY:
* Voltage (120 V AC, 1-phase, 3-wire, 60 Hz): #9890 for lock-
ing plug, or #9891 for non-lock plug. If standard 10 ft (3
meter) power cable is not required, specify #9986 for 6 ft (1.8
meter) cable.

• Telecommunications Cord (modem to communication line):
  10 ft (3 meters) specify #9710
  25 ft (7.5 meters) specify #9713

• Related Equipment: one 3865 Attach-
  ment Feature Code from the table below must be specified for
each 3865, depending upon the unit to which it is attached.

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<th>Machine Feature #</th>
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<td>3791 9535</td>
</tr>
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<td>3275 9514</td>
<td>4351 9571</td>
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<td>8101 9569</td>
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<td>3601 9532</td>
<td>8130 9567</td>
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<td>8140 9568</td>
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<td>3632 9561</td>
<td>Non-IBM 9520</td>
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<tr>
<td>3704 9516</td>
<td>RPQ Machine 9524</td>
</tr>
<tr>
<td>3705 9515</td>
<td></td>
</tr>
</tbody>
</table>

• Operational Mode (one must be selected so that the modem
can be shipped from the plant ready to install).  
  - Model 1 (point to point) -- one modem must be specified as
    LOCAL, and the other as REMOTE. Selection of one of
    these codes determines how the Automatic Remote Speed
    Selection feature in the modem will function:
      Local Data Rate Control ... specify #9330 -- allows mo-
      dem data rate to be changed by the "Full Speed/Half
      Speed" switch on the operator panel, or to the rate se-
      lected by its attached DTE through control of the "Data
      Rate Select" interface lead to the modem. This specify
      code should be used for modems located at the "System
      Host Location" end of this telephone line.
      Remote Speed Selection ... specify #9331 -- allows
      modem to automatically adjust its data rate to the rate it is
      receiving data over the line. The modem will ignore the
      setting of its "Full Speed/Half Speed" switch.
  - Model 2 (multipoint) -- selection of one of these codes
    determines the operating mode of the modem, and how data
    rate will be controlled:
      Multipoint Control ... specify #9332 -- modem will operate
      as a multipoint control station in the multipoint network.
    The modem is automatically set to local data rate control.
      Multipoint Tributary ... specify #9333 -- selects modem
      for operation as a tributary station in the multipoint net-
      work. Tributary stations are automatically designated for
      remote speed selection.

Note: The operational mode can be changed by switch
setting.

<table>
<thead>
<tr>
<th>PRICES Mdl</th>
<th>MRC</th>
<th>Purchase</th>
<th>MLC/</th>
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<tr>
<td>2</td>
<td>194</td>
<td>165</td>
<td>5,300</td>
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</table>

Plan Offering: Plan D  
Machine Group: D  
Warranty: B  
Per Call: 1
Purchase Option: 65%  
Useful Life Category: 2
Termination Charge Percent: 25% Termination Charge Months: 5
Upper Limit Percent: 5%
Initial Period of Maintenance Service Availability: 3 mos.
3865 Modem (cont'd)

SPECIAL FEATURES

DATA MULTIPLEXER (#3260). [Mdl 1 only] Allows selection of a 4800 bps and 2400 bps subchannel. The modem multiplexes subchannel data into a single aggregate data stream. This feature offers four channel configurations. When the 3865 is placed in half speed mode, the aggregate data stream is transmitted at half speed and as a result the channel configurations will be automatically altered because of lower speed. Channel configurations are:

<table>
<thead>
<tr>
<th>Channels</th>
<th>Half Speed Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A  B   C   D</td>
</tr>
<tr>
<td>9600</td>
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<td>4800</td>
<td>4800</td>
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<td>2400</td>
<td>2400</td>
</tr>
<tr>
<td>2400</td>
<td>2400</td>
</tr>
</tbody>
</table>

All data sources are connected to the 3865 model 1 by separate EIA/CCITT interfaces. Multiplexer channels will permit attachment to co-located terminals or tailed circuit extensions for network flexibility and cost savings. Tail circuit extensions allow co-located modems (3863 or 3864) to be attached to a 3865 channel. Modems so attached can extend the channel data path by its attached communications line and second (remotely attached) modem. Each multiplexer channel is equipped with buffers to compensate for timing variations between tailed modems and the 3865 clocks. The tailing accessory (#7875) is required on the 3863 or 3864 modems when attached. Limitations: If 3863 and 8364 "tailed" modems are attached they must be m18 operating in point to point or multipoint control mode only. No LPDA support is available. Field Installation: Yes.

FAN OUT (#3901). Allows attachment of up to three teleprocessing machines to one 3865 ... see "Related Equipment" under "Specifications" for applicable machines. Only one of the attached machines may transmit at a time. This feature may be used at a tributary station in a centralized multipoint network. In this configuration, multipoint programming discipline will provide the selection/control of the specified IBM terminals without any additional user involvement.

This feature may also be used to allow up to three of the specified IBM Multiplexers or Communications Controllers at a central site to share the same 3865 modules for backup purposes. In this case, although all of the machines attached to the 3865 will receive the incoming data simultaneously, the user switchover procedure must ensure that only one machine is sending. Limitation: Cannot be installed with DTE (external) clock. Field Installation: Yes.

EXTENDED DIAGNOSTIC CARD (#7930). Used to give a remote modem power loss indication. The feature must be installed on the local and remote modems. The feature card in the remote modem detects the loss of DC power and signals it with an "out-of-band" tone to the local feature card. Prerequisites: #7930 must be installed in both the local and remote modems ... also see LPDA in "Highlights" for required Program Product support. Field Installation: Yes.

4-WIRE SWITCHED NETWORK BACKUP (4W-SNBU) (#7953). Provides backup for the non-switched telecommunication facility. Data rate in 4W-SNBU mode is the same as in normal non-switched line mode. 4W-SNBU allows restoration of the 4-wire service between two point or multipoint 3865s. For point to point configurations, except for the requirement to establish the switched connections, 4W-SNBU allows continuation of service with no operational or programming impact.

For multipoint configurations, operational (and possibly programming) modifications are required. 4W-SNBU can be configured in two ways:

- The 4W-SNBU feature is installed on the normal multipoint control station modem and on any tributary modems that require backup. To establish a backup path to any tributary, the control station modem must go to SNBU mode. In doing so, communication is broken to all other tributaries.

- A spare control station modem equipped with the 4W-SNBU feature is installed on a spare port at the control station location. The spare control station can then establish a 4W-SNBU connection to any 3865 tributary modem equipped with the 4W-SNBU feature. This tributary is deactivated from its normal polling list and assigned to the spare port. The normal control station continues to provide service to other tributaries still reachable over the non-switched line.

This feature requires two 2-wire 'switched' telephone lines, and two telephones at the host site. Attachment to the switched lines is made as described in the "Attachment to Facilities" section above. The feature is designed to automatically answer when a call is received. Calls must be placed manually. When one call is placed and the connection completed, a four minute timer is started. The second line must be established within the time-out, otherwise the first line is automatically dropped. Limitations: It may be necessary to re-dial or change to half speed to maintain acceptable performance in SNBU mode. See customer responsibilities section of M 2700 pages for details. Field Installation: Yes.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC</th>
<th>2 Yr</th>
<th>Purchase</th>
<th>MMC</th>
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</thead>
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<td>Fan Out</td>
<td>3901</td>
<td>24</td>
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<td>750</td>
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<tr>
<td>Ext Diagnostic</td>
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<td>4-WIRE SNBU</td>
<td>7953</td>
<td>38</td>
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</tr>
</tbody>
</table>

ACCESSORIES

The following item is available on a purchase only basis. Order the feature number indicated below.

RACK MOUNT ADAPTER (#6240). A rack adapter that fastens inside a standard 19 inch EIA rack. The adapter is a shelf with an inside width of 17-3/8 inches (441.3 mm) which will allow two standalone modems to be placed side by side. The adapter will fit racks with depths of 23-5/8 to 30 inches (600 to 760 mm). Field Installation: Yes.

Order Rack Mount Adapter #6240 $70

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IBM 3872 MODEM

Purpose: A 2400 bps modem, with half-speed capability, used to provide communications products with the means for transmitting data over common carrier provided voiceband private line (non-switched) channels, equivalent privately owned channels or switched telecommunication networks.

Highlights: Modem operation is possible in half-duplex mode over 2- or 4-wire half-duplex facilities, half-duplex or duplex mode over duplex facilities, or half-duplex mode over switched telecommunication networks.

Data Rates -- 2400 bps with back-up half-speed.

Equalization -- manually adjustable by operator on private line (non-switched) channels and automatic on switched networks.

Operation -- switched network or multipoint control, multipoint tributary, point-to-point on a private line (non-switched) channel. See "Special Features."

Built-in Diagnostics -- included in each modem are the following diagnostic features accessible to the operator: (1) The modem may be LINE TESTED independently of the using machine and telecommunication channel ... (2) It may be LINE TESTED with a remote modem and telecommunications channel, independently of the attached business machine. The test may be one way or remotely wrapped to the local modem.

Communications Facilities: Communication common carrier provided voiceband private line (non-switched) channel, type 3002 (or equivalent) as described in the Bell System Technical Reference PUB 11004, dated Oct., 1973. NOTE: MACHINES with a serial number prior to 13100 and a suffix prior to HZ with Multipoint Tributary (#5101, 5102) or Point-to-point (#6101, 6102) feature require installation of an RPQ to operate on a basic (not conditioned) 3002 channel. Machines shipped from the plant after June 1, 1976, do not require the RPQ. Conditioned lines may be used but are not required.

Privately Owned Communications Facilities -- equivalent to above.

Public Switched Networks

The customer must be advised that satisfactory data transmission depends upon the characteristics of the particular switched network connection being used. Refer to M 2700 pages for further details.

International Facilities: Transmission of data between the United States and Canada on non-switched or switched facilities is supported. (For non-switched operation, the channel in Canada must be a schedule 4, type 4.)

Attachment to Facilities: Attachment to a private line (non-switched) channel is by a cable, supplied with the 3872, which is terminated with a four prong plug (WE 283B or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communications equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3872 is equipped with Switched Band Network Back-up (#8721), another cable is supplied with the feature. This cable is also terminated with a four prong plug and requires the aforementioned type of receptacle which is connected to the Data Access Arrangement CDT (WE 100DA or equivalent).

If the 3872 is equipped with Switched Network (#7941, #7942) or Switched Network Back-up with Automatic Answer (#7952) a cable is supplied with the feature which is terminated with spade lugs for connection to the Data Coupler CBS (WE 100A, series 5 or later, or WE 1001F, or equivalent).

Related Equipment: The 3872 operates with IBM communications products capable of 2400 bps operation ... see "Related Equipment" under "Specify." Modem locking must be used. The IBM 3872 Modem must communicate with another appropriately equipped 3872, or with an appropriately equipped IBM 2400 bps Integrated Modem. The interconnecting cable between the business machine and the modem must be supplied by the business machine. If the 3872 is equipped with the Automatic Call Originate (#1091) feature, the interconnecting Auto-Call cable between the business machine and the modem must be supplied by the business machine.

Customer Responsibilities: The customer must be informed of his responsibilities as detailed in the M 2700 pages and in the Installation Planning section of the 3872 User's Guide, GA27-3058. The customer is responsible for:

(1) Private line (non-switched) channel -- arranging for the telecommunications service supplier to provide a type 3002 voice grade data channel (or equivalent) as described under "Communications Channel Specifications" in the 3872 User's Guide. Also arranging for the installation of the appropriate receptacle described in "Attachment to Facilities."

(2) Switched Telecommunication Network -- arranging for the telecommunication service supplier to install the appropriate communications equipment with the required connecting device as described in "Attachment to Facilities" and for attaching the IBM provided cable to the connecting device.

Also inform the telecommunication service supplier that the speed of data transmission will be 2400 bps and that appropriate conditioning of the local loop is required. The customer must be made aware that the use of local loops not properly conditioned for the speed of data transmission or the use of special switched facilities may result in unsatisfactory data transmission.

(3) Providing voice communications between modems to coordinate tests or re-equalization. The voice facility can be provided by the 3872 Alternate Voice feature. Information concerning the handset for the Alternate Voice feature is described in the 3872 Modem User's Guide. The voice facility must be located such that an operator can use it while operating the controls on the front of the modem.

(4) If the 3872 is to be attached to a non-IBM product, the interconnecting cable between the business machine and the modem must be supplied by the business machine.

(5) If the 3872 is equipped with the Automatic Call Originate feature (#1091), the interconnecting Auto-Call cable between the business machine and the modem must be supplied by the business machine.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.


Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9860 for 115 V, #9884 for 208 V, #9866 for 230 V. Non-locking plug -- #9881 for 115 V, #9885 for 208 V, #9887 for 230 V.

[2] Telecommunication Cord (modem to telecommunication facility): Specify one of the following for each telecommunication channel or network connection.

#9750 -- Telecommunication cord to connect a basic (control station) 3872 modem, or one equipped with Multipoint Tributary (#5101), or Point-to-point (#6101) feature, to a private line (non-switched) channel.

#9751 -- Telecommunication cord to connect a basic (control station) 3872 Second Modem (#6302) or second modem equipped with Multipoint Tributary (#5102), or Point-to-point (#6102) feature, to a non-switched (non-switched) channel.

#9752 -- Telecommunication cord to connect a 3872 modem equipped with Switched Network (#7941) to a switched telecommunication network.

#9753 -- Telecommunication cord to connect a 3872 Second Modem (#6302) equipped with Switched Network (#7942) to a switched telecommunication network.

#9754 -- Telecommunication cord to connect a 3872 modem equipped with Switched Network Back-up (#7951) or Switched Network Back-up with Automatic Answer (#7952) to a switched telecommunication network.

A 10-foot cable will be supplied. If a longer cable is required, indicate 15, 20 or 25 feet as the quantity of the feature specified. NOTE: orders to add the Switched Network Back-up feature(s) (#7951 or #7952), to convert a private line (non-switched) channel modem to Switched Network, or to convert a Switched Network modem to private line (non-switched) channel include the telecommunication cord specify number(s) compatible with the resultant modem configuration.

[3] Related Equipment: one 3872 Attachment Feature Code from the table below must be specified for each 3872, depending upon the unit to which it is attached. NOTE: For attachment to 1130, System/3, System/32, System/34, 142/220, 20, 5101, 5110 or 5230, refer to General System Division.

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The 3872 Modem, with no additional feature required, is used at the control station in a centralized multipoint network. Additional capabilities/configurations are provided by the following features:

**ALTERNATE VOICE (#1051, 1052).** Provides signalling capability and a switch control panel to which a customer provided handset may be plugged permitting voice communications with the distant 3872 Modem(s). Data cannot be simultaneously transmitted with voice. A handset is not provided with 3872. User’s Guide for description of handset. #1051 -- for basic modem ... #1052 -- for Second Modem (#6302). Maximum: One of each. Limitation: #1051 cannot be installed with Switched Network Back-up (#7941). ... #1052 cannot be installed with Switched Network (#7942). Field installation: Yes. Prerequisite: #1052 requires Second Modem (#6302).

**AUTOMATIC CALL ORIGINATE (#1109).** Permits automatic origination of a call by the using machine equipped with an IBM autodial feature. Provides control to the common carrier Data Coupler Type CBS (or equivalent). Call must be established and answered manually. Note: To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal.

This feature can be used with BTAM programs for DOS, DOS/VS, OS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required, in existing BTAM programming, to fully utilize the capabilities of the Switched Network Back-up feature. For additional information, see the 3872 User’s Guide. Conditioning of the telecommunication service local loop for transmission of data faster than 300 bps is required. Maximum: One. Limitations: Cannot be installed with Second Modem (#6302), or Switched Network features (#7941, 7942 or 7951). Specify: Telecommunication cord #7953 for feature #7942. Field Installation: Yes. Prerequisite: #7942 requires Second Modem (#6302).

**MULTIPOINT TRIBUTARY (#5101, 5102).** Used on each modem attached to tributary stations in a centralized multipoint network to compensate for line distortion between the control and tributary station. Operator adjustment on front panel. #5101 -- for basic modem ... #5102 -- for Second Modem (#6302). Maximum: One of each. Limitation: #5101 cannot be installed with Point-to-Point (#6101) or Switched Network (#7942). ... #5102 cannot be installed with Point-to-Point (#6102) or Switched Network (#7942). Specify: Telecommunication cord #7950 for feature #5101 ... #7951 for feature #5102. Field Installation: Yes. Prerequisite: #5102 requires Second Modem (#6302).

**POINT-TO-POINT (#6101, 6102).** Used on modems at each end of a point-to-point private line (non-switched) channel to compensate for line distortion. #6101 -- for basic modem ... #6102 -- for Second Modem (#6302). Maximum: One of each. Limitation: #6101 cannot be installed with Multipoint Tributary (#5101) or Switched Network (#7941). #6102 cannot be installed with Multipoint Tributary (#5102) or Switched Network (#7942). Specify: Telecommunication cord #7970 for feature #6101 ... #7971 for feature #6102. Field Installation: Yes. Prerequisite: #6102 requires Second Modem (#6302).

**SECOND MODERN (#6302).** Permits two modems, each to operate on a separate line, to be housed in the same stand-alone cabinet. The two modems share the same power supply. Maximum: One. Limitation: Only the following features are allowed on either or both modems: Automatic Voice (#7941, 1051, 1052), Point-to-Point (#6101, 6102), Multipoint Tributary (#5101, 5102), or Switched Network (#7941, 7942). Field Installation: Available at time of manufacture only.

**SWITCHED NETWORK (#7941, 7942).** Used for operation over public switched network via the common carrier Data Coupler type CBS (or equivalent). Automatic answering of incoming calls will be performed by the modem. Automatic Answer must be installed at the beginning of each call. #7941 -- for basic modem ... #7942 -- for Second Modem (#6302). Conditioning of the telecommunication service local loop for transmission of data faster than 300 bps is required. It can communicate with another 3872 equipped with Switched Network (#7941 or #7942), with Switched Network Back-up (#7951) or with Switched Network Back-up with Automatic Answer (#7952). Maximum: One of each. Limitations: #7941 cannot be installed with Alternate Voice (#1051), Fan-Out (#6301) or #1052. ... #7942 cannot be installed with Alternate Voice (#1052), Multi-point Tributary (#5102), or Point-to-Point (#6102). Specify: Telecommunication cord #7972 for feature #7941 ... #7973 for feature #7942. Field Installation: Yes. Prerequisite: #7942 requires Second Modem (#6302).

**SWITCHED NETWORK BACK-UP (#7951).** Provides the capability of attaching the 3872 to the public switched network as a back-up to the private line (non-switched) channel. It can communicate with another 3872 equipped with Switched Network (#7941 or #7942), with Switched Network Back-up (#7951) or with Switched Network Back-up with Automatic Answer (#7952). A fixed compression equalizer is provided for the back-up operation. A front panel switch permits operator selection of either the prime or the back-up facility. Both facilities cannot be used simultaneously.

Attachment to the switched network is made via the common carrier Data Access Arrangement type CDT (or equivalent). Cables must be established and answered manually. Note: To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal.

This feature can be used with BTAM programs for DOS, DOS/VS, OS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required, in existing BTAM programming, to fully utilize the capabilities of the Switched Network Back-up feature. For additional information, see the 3872 User’s Guide. Conditioning of the telecommunication service local loop for transmission of data faster than 300 bps is required. Maximum: One. Limitations: Cannot be installed with Second Modem (#6302), or Switched Network features (#7941, 7942 or 7951). Specify: Telecommunication cord #7974. Field Installation: Yes.

**SWITCHED NETWORK BACK-UP WITH AUTOMATIC ANSWER (#7952).** Same as Switched Network Back-up (#7951) plus the added capability of automatic answering incoming calls when attached to a common carrier Data Coupler type CBS (or equivalent). Note: To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal.

This feature can be used with BTAM programs for DOS, DOS/VS, OS, OS/VS1 and OS/VS2 in certain configurations. Additional customer routines will be required, in existing BTAM programming, to fully utilize the capabilities of the Switched Network Back-up feature. Conditioning of the telecommunication service local loop for transmission of data faster than 300 bps is required. For additional information, see the 3872 User’s Guide. Maximum: One. Limitations: Cannot be installed with Second Modem (#6302), or Switched Network features (#7941, 7942 or 7951). Specify: Telecommunication cord #7975. Field Installation: Yes.
Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MRC</th>
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<th>MMMC</th>
</tr>
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<tbody>
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<td>$45</td>
</tr>
<tr>
<td>Alternate Voice - Second</td>
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<tr>
<td>Automatic Call Originate</td>
<td>1091</td>
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<td>Fan-Out</td>
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<td>Switched Network Back-up with Automatic Answer</td>
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<td>16</td>
<td>455</td>
</tr>
</tbody>
</table>

* Multipoint Control Modem.
† For Basic Modem.
‡‡ For Second Modem.

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IBM 3874 MODEM

Purpose: A 4800 bps modem, with half-speed capability, used to provide communications products with the means for transmitting data over common carrier provided voiceband private line (non-switched) channels, equivalent privately owned channels or switched telecommunication networks.

Highlights: Modem operation is possible in half-duplex or duplex mode over 4-wire duplex facilities or half-duplex over 2-wire switched telecommunication networks.

Data Rates: 4800 bps with back-up half speed.

Equalization: Automatic.

Operation: Switched network or multipoint control, multipoint tributary, point-to-point on a private line (non-switched) channel. See "Special Features."

Built-in Diagnostics: Included in each modem are the following diagnostic features accessible to the operator: (1) The modem may be WRAP TESTED independently of the using machine and telecommunication channel ... (2) It may be LINE TESTED with a remote modem and telecommunication channel, independently of the attached business machine. The test may be one way or remotely wrapped to the local modem ... (3) Facility is provided to allow the attached machine to initiate a local wrap test independently from the telecommunication channel via an interface lead.

Communications Facilities: Communications common carrier provided voiceband private line (non-switched) channel, type 3002, with C1 conditioning (or equivalent) as described in the Bell System Technical Reference PUB 41004 dated Oct., 1973.

Privately Owned Communications Facilities: Equivalent to above.

Public Switched Telecommunication Networks: The customer must be advised that satisfactory data transmission depends on the characteristics of the switched network connection being used ... see M 2700 pages for further details.

International Facilities: Transmission of data between the United States and Canada on non-switched or switched facilities is supported. (For non-switched operation, the channel in Canada must be a schedule 4, type 4, with 4A conditioning.)

Attachment to Facilities: Attachment to a private line (non-switched) channel is by a cable, supplied with the 3874, which is terminated with a four prong plug (WE 404B or 549A surface mount or 439A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of communication equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3874 is equipped with Switched Network Back-up (#7951) another cable is supplied with the feature. This cable is also terminated with a four prong plug and requires the aforementioned type of receptacle which is connected to the Data Access Arrangement CDT (WE 1000A or equivalent).

If the 3874 is equipped with Switched Network (#7941) or Switched Network Backup with Automatic Answer (#7952) a cable is supplied with the feature which is terminated with spade lugs for connection to the Data Coupler CBS (WE 1001A series 5 or later or WE 1001F or equivalent).

Related Equipment: The 3874 operates with IBM communications products capable of 4800 bps ... see "Related Equipment" under "Specify." Modern clocking must be used. The 3874 modem must communicate with another appropriately configured 3874 or IBM 4800 bps Integrated modem. The interconnecting cable between the business machine and the modem must be supplied by the business machine. If the 3874 is equipped with the Automatic Call Originate feature (#1091), the interconnecting Auto Call cable between the attached modem and the modem must be supplied by the attached machine.

Customer Responsibilities: The customer must be informed of his responsibilities as detailed in the M 2700 pages and in the Installation Planning Section of the 3874 User's Guide, GA33-0002. The customer is responsible for:

(1) Private line (non-switched) channel -- arranging for the telecommunication service supplier to provide a type 3002 voice grade data channel with C1 conditioning (or equivalent) as described under "Communication Channel Specifications" in the 3874 User's Guide. Also arranging for the installation of the appropriate receptacle described in "Attachment to Facilities."

(2) Switched Telecommunication Network -- arranging for the telecommunication service supplier to install the appropriate communication service equipped with the required connecting device as described in "Attachment to Facilities."

Also inform the telecommunication service supplier that the speed of data transmission will be 4800 bps and that appropriate conditioning on the local loop is required. The customer must be made aware that the use of local loops not properly conditioned for the speed of data transmission or the use of special switched facilities may result in unsatisfactory data transmission.

(3) For attaching the IBM provided line cable to the common carrier provided Data Access Arrangements.

(4) Providing voice communications between modems attached to non-switched lines to coordinate tests. This voice facility can be provided by 3874 Alternate Voice feature. Information concerning the handset for the Alternate Voice feature is described in the 3874 Modem User's Guide. The voice facility must be located such that an operator can use it while operating the controls on the front of the modem.

(5) If the 3874 is to be attached to a non-IBM product, the interconnecting cable between the business machine and the modem must be supplied by the business machine.

(6) If the 3874 is equipped with the Automatic Call Originate feature (#1091), the interconnecting Auto Call cable between the business machine and the modem must be supplied by the business machine.

See M 2700 pages for additional customer responsibilities.

Bibliography: See KWIC Index G320-1621 or specific system bibliography.


Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): Locking plug -- #9880 for 115 V, #9884 for 208 V, or #9886 for 230 V. Non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Telecommunication Cord (modem to telecommunication facility): Specify one of the following for each connection to a private line (non-switched) channel and for each connection to a switched telecommunication network ... see "Attachment to Facilities."

#9750 -- Telecommunication cord to connect a 3874 modem provided with Point-to-Point (#6101), Multipoint Control (#5100), or Multipoint Tributary (#5101) features to a private line (non-switched) channel.

#9754 -- Telecommunication cord to connect a 3874 modem provided with Switched Network (#7941) or Switched Network Backup with Automatic Answer (#7952) features to a switched telecommunication network terminated by a Data Coupler type CBS.

#9752 -- Telecommunication cord to connect a 3874 modem provided with Switched Network Backup (#7951) to a switched telecommunication network terminated by a Data Access Arrangement type CDT.

A 10-foot cable will be provided as standard. If a longer cable is required, indicate 15, 20 or 25 feet as the quantity of the feature # specified. Note: orders to add the Switched Network Backup feature (#7951 or #7952) or to convert a non-switched modem to switched network or to convert a switched network to non-switched channel must include the telecommunication cord specify number(s) compatible with the resultant modem configuration.

[3] Related Equipment: one 3874 Attachment Feature # from the table below must be specified for each 3874, depending upon the unit to which it is to be attached. Note: For attachment to 1130, 5010, 5110, 5231, System/3, System/32, System/34, or S/360 mld 20, refer to General Systems Division.
3874 Modem

Machine Attachment #

1826 #9502 3861/3862 #9560
2025 9504 3861-25/50/75 9534
2701 9505 3864 9572
2703 9506 3704 9516
2715-2 9507 3705 9515
2772 9508 3735 9517
2780 9509 3771 9540
3115 9527 3773 9541
3125 9525 3774 9542
3135,3135-3 9512 3775 9521
3138 9550 3776 9544
3271 9513 3777 9547
3274 9558 3780 9521
3275 9514 3791 9535
3276 9557 4331 9171
3601,3602 9532 8301 9169
3614 9532 8130 9567
Non-IBM 9520 8140 9568
RPQ Machine 9524

ETP/ M AC/ MLC

PRICES: Mdl Purchase MMMC
3874 1 $170 $145 $3,570 $6

Plan Offering: B Warranty: B Maintenance: B Purchase Option: 50% Useful Life Category: 2 Per Call: 2
Termination Charge Moths: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

FEATURES

Pre requisite: One of the following special features must be instal led: Multipoint Control (#5100), Multipoint Tributary (#5101), Point-to-Point (or equivalent). See "Customer Responsibilities." Maximum: One. Limitation: Cannot be installed with Multipoint Control Back-up (#7951), Switched Network Back-up with Automatic Answer (#7952), or Fan-out (#3901). Field Installation: Yes. Prerequisites: Switched Network Back-up (#7941) and an IBM Automatic Call feature on the using machine.

3874 Modem (cont’d)

FAN-OUT (#3901). This feature allows attachment to the 3874 of up to three IBM teleprocessing machines at one location. See "Specify" for applicable machines. Only one of the attached machines may transmit at a time. The feature may be used at a tributary station in a centralized multipoint network. In this configuration, multipoint programming discipline will provide the selection/control of the specified IBM terminals without any additional user involvement.

This feature may also be used to allow up to three of the specified IBM Multiplexers, Communications Controllers, Integrated Communications Adapters, or Communications Adapters on 4331s at a central site to share the same 3874 modem for back-up purposes. In this case, although all of the machines attached to the 3874 will receive the incoming data, the switchover procedure must ensure that only one machine is sending. Maximum: One. Limitation: Cannot be installed with Automatic Call Originate (#1091). It is supported with restrictions by 3704/3705 NCP, see "Programming" section of sales manual. Field Installation: Yes.

SWITCHED NETWORK BACK-UP (#7951). Provides the capability of attaching the 3874 modem to a public switched network as a back-up to the prime leased facility. It can communicate at 4800/2400 bps with another 3874 equipped with Switched Network Back-up (#7941). Switched Network Back-up with Auto Answer (#7952). Attachment to the switched network is made via the common carrier Data Access Arrangement type CDB (or equivalent). Calls must be established and answered manually.

Note: To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal. This feature can be used with BTAM programs for DOS, DOS/V, OS, OS/V1 and OS/V2 in certain configurations. Additional customer program routines will be required in existing BTAM programming to fully utilize the capabilities of feature #7951. Conditioning of the telecommunication service local loop for the transmission of data faster than 300 bps is required. See "Customer Responsibilities." Maximum: One. Limitation: Cannot be installed with IBM 3704 or 3705, or Automatic Call Originate (#1091). See "Programming" section in sales manual for restricted configurations. Specify: Telecommunication cord (#7952). Field Installation: Yes.

SWITCHED NETWORK BACK-UP WITH AUTOMATIC ANSWER (#7952). Provides the capability of attaching the 3874 modem to a public switched network as a back-up to the prime leased facility. It can communicate at 4800/2400 bps with another 3874 equipped with Switched Network Back-up (#7941). Switched Network Back-up with Auto Answer (#7952), or Automatic Call Originate (#1091). See "Programming" section in sales manual for restricted configurations. Specify: Telecommunication cord (#7952). Field Installation: Yes.

Switched Network Back-up with Automatic Answer (#7952) plus the added capability of automatically answering incoming calls. Requires attachment to a common carrier Data Coupler type CBS (or equivalent). Conditioning of the telecommunication service local loop for the transmission of data faster than 300 bps is required by "Customer Responsibilities." Note: To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the using system/terminal. Maximum: One. Limitation: Cannot be installed with IBM 3704 or 3705, or Automatic Call Originate (#1091). See "Programming" section in sales manual for restricted configurations. Specify: Telecommunication cord (#7952). Field Installation: Yes.

Special Feature Prices:

E TP/ M AC/ MLC

Alternate Voice #1051 $18 $15 $383 $50
Automatic Call Originate 1091 36 31 765 4.50
Fan-out 390 29 25 638 2.00
Multipoint Control 5100 42 36 833 11.00
Multipoint Tributary 5101 18 15 383 5.50
Point-to-Point 6101 18 15 383 2.00
Switched Network 3615 31 3651 6.00
Switched Network Bk-up 7951 24 20 510 4.50
Switched Network Back-up with Automatic Answer 7952 29 25 638 4.50

Automatic Call Originate (#1091). Permits automatic origination of a call by using machine equipped with an IBM Automatic Call feature to the common carrier Data Coupler, type CBS (or equivalent) to dial telephone numbers and to provide on hook/off hook control. Note: Can only be used with Rotary Dial Systems. Maximum: One. Limitations: Cannot be installed with Switched Network Back-up (#7951), Switched Network Back-up with Automatic Answer (#7952), or Fan-out (#3901). Field Installation: Yes. Prerequisites: Switched Network Back-up (#7941) and an IBM Automatic Call feature on the using machine.
CONFIGURATION

```
3874 MODEM

SNP * Y
N
Alternate Voice Y
N
Multipoint Tributary Y
N
Point to Point Y
N
Multipoint Control

Switched Network (1941)

Alternate Voice (1051)

Multipoint Tributary (6101)

Point to Point (6101)

Multipoint Control (5100)

Auto Cell

Auto Cell Original (1201)

SMBU ** Y
N
OBS

Switched Network Backup with PA (1963)

Switched Network Backup (17051)

FAN-Out (3001)

Specify:
1. Power Cord
2. Telecommunication Cord
3. Related Equipment

ENQ
```

* Switched Network Prime Operation
** Switched Network Back-up

Not to be reproduced without written permission.
Purpose: Provides communications terminals with the means of transmitting data at 7200 bps, with half-speed capability, over common carrier provided voiceband private line (non-switched) channels, equivalent privately owned channels, or, at 3600 bps, with half-speed capability, over switched telecommunication networks.

Highlights: Modern operation is possible in half-duplex or duplex mode over 4-wire duplex facilities or half-duplex mode with the Switched Network Back-up feature over switched telecommunication networks.

Data Rates -- 7200 bps with back-up half-speed on private line (non-switched) channels... 3600 bps with back-up half-speed on switched telecommunication networks.

Equalization -- manually adjustable by an operator on private line (non-switched) channels. Fixed compromise on back-up switched telecommunication networks.

Operation -- Multipoint control, multipoint tributary, point-to-point privacy on private (non-switched) channel. Switched telecommunication network as a back-up to the private line (non-switched) channel. See "Special Features."

Built-in Diagnostics -- included in each modem are the following diagnostic features accessible to the operator:
- The modem may be WRAP TESTED independently of the using machine and telecommunication channel.
- The modem may be LINE TESTED with a remote end modem and telecommunication channel independently of the attached business machines. The test may be one way or remotely wrapped back to the local modem.

Communications Facilities: Communications Common Carrier provided voiceband private line (non-switched) channel, type 3002, with C2 conditioning (or equivalent) as described in the Bell System Technical Reference PUB 41004, dated Oct., 1973.

Normally the telecommunication service defined in the preceding statement provides for satisfactory operation of the 3875. However, there may be unusual circumstances where the channel characteristics exceed the tolerance level of the 3875. Where these characteristics cause an unacceptable error rate, the customer may request the telecommunication service supplier to provide D1 conditioning in addition to the C2 conditioning. D1 conditioning may not be available in some locations. For this situation the customer may request the telecommunication service supplier to provide alternate routing or special engineering effort.

D1 conditioning is NOT available under existing tariffs for multipoint networks. If an unacceptable error rate is encountered, the alternatives available to the customer are to request the telecommunication service supplier to provide re-routing or special engineering effort.

The telecommunication service supplier may not always be able to supply alternate routing or special engineering effort.

The operation of a multipoint network is more critical of line characteristics due to the cumulative effect of all the segments in the network. Actual performance cannot be accurately predicted but can only be established after the installation of the equipment.

The customer must be made aware of these exposures and the available alternatives prior to ordering the equipment. See M 2700 pages - "Customer Responsibilities."

Privately Owned Communications Facilities -- equivalent to above.

Public Switched Network

The customer must be advised that satisfactory data transmission depends on the characteristics of the switched telecommunication network connection being used... see M 2700 pages for further details.

International Facilities: Transmission of data between United States and Canada is supported. (In Canada a Schedule 4, Type 4, channel with 4B conditioning is required. The equivalent of D1 conditioning is not available in Canada.)

Attachment to Facilities: Attachment to a private line (non-switched) channel is by a cable, supplied with the 3875, which is terminated with a four prong plug (WE 283B or equivalent). The plug mates with a receptacle (WE 404B or 549A surface mount or 493A flush mount, or equivalent) which is connected to the channel. (The receptacle is a conventional item of connecting equipment and is, upon customer request, ordinarily furnished by the telecommunication service supplier.)

If the 3875 is equipped with Switched Network Back-up (#7952) a second cable is supplied with the feature. This cable is also terminated with a four prong plug and requires the aforementioned type of receptacle which is connected to the Data Access Arrangement type CDT (WE 1000A or equivalent).

If the 3875 is equipped with Switched Network Back-up with Automatic Answer (#7952) a cable is supplied with the feature which is terminated with spade lugs for connection to the Data Coupler type CBS (WE 1001A series 5 or later or WE 1001F or equivalent).

Related Equipment: The 3875 Modem operates with the binary synchronous control adapters of the IBM machines listed in the table under "Specify." Modem clocking must be used. See M 2700 pages for further details.

Customer Responsibilities: The customer must be informed of his responsibilities as detailed in the M 2700 pages and in the Installation Planning section of the 3875 User's Guide, GA33-0001. The customer is responsible for:

1. Private line (non-switched) channel -- arranging for the communication common carrier to provide a voiceband private line (non-switched) channel, type 3002, with C2 conditioning as described in the Bell System Technical Reference PUB 41004 "Data Communications Using Voiceband Private Line Channels" (October, 1973). Arrange for the installation of the appropriate receptacle described in "Attachment to Facilities."

2. Public switched telecommunication network -- arranging for the telecommunication service supplier to install the appropriate communication service equipment with the required connecting device as described in "Attachment to Facilities" and for attaching the IBM provided cable to the connecting device.

Also inform the telecommunication service supplier that the speed of data transmission will be 3600 bps and that appropriate conditioning of the local loop is required. The customer must be made aware that the use of local loops not appropriately conditioned for the speed of data transmission or the use of special switched facilities may result in unsatisfactory data transmission.

3. Providing voice communications between control and tributary stations to coordinate test or re-equalize. This voice facility can only be provided by the Alternate Voice feature. Information concerning the handset for the Alternate Voice feature is described in the 3875 Modem User's Guide.

4. When the 3875 is to be attached to other than an IBM machine, that business machine must provide the interconnecting cable between the connector or digital equipment and the modem.

PREREQUISITE: See "Teleprocessing Systems" in GI section of sales manual.

Bibliography: GA24-3089


Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): For locking plug -- #9880 for 115 V, #9884 for 208 V, or #9885 for 230 V. For non-lock plug -- #9881 for 115 V, #9885 for 208 V, or #9887 for 230 V.

[2] Telecommunication Cord (modem to telecommunication facility): Specify one of the following for each connection to private line (non-switched) channel or to a switched telecommunication network.

#9750 Telecommunication cord to connect a 3875 modem to a private line (non-switched) channel.

#9031 Telecommunication cord to connect a 3875 modem equipped with Switched Network Back-up (#7951) to a switched telecommunication network.

#9032 Telecommunication cord to connect a 3875 modem equipped with Switched Network Back-up with Automatic Answer (#7952) to a switched telecommunication network.

A 10 foot cable will be supplied as standard. If a longer cable is required, indicate 15, 20 or 25 feet as a quantity of the feature number specified. NOTE: orders to add Switched Network Back-up (features #7951, #7952) must include the telecommunication cord specify number for the appropriate cord.

SPECIAL FEATURES
The basic 3875 Modem (#9101) is used as the control station in a centralized multipoint network. Specify: #9101 and telecommunication line cord #7950.

Additional capabilities/configurations are provided by the following features.

ALTERNATE VOICE (#1051). Provides signalling capability, and a jack on the operator panel into which the customer provided handset may be plugged, permitting voice communication with the other end. Data cannot be simultaneously transmitted with voice. A handset is not provided. See 3875 User’s Guide for description of handset use.

CONTROL STATION EQUALIZER (#1601). Provides the capability for a multipoint control station to operate with the Switched Network Back-up (#7951, 7952) features. Maximum: One. Field Installation: Yes. Prerequisite: Control Station Specify #9101.

FAN OUT (#3901). Permits attachment, to one 3875, of up to three business machines at one location. Only one of the machines may transmit at a time. The feature may be used at a tributary station or on a multipoint configuration, in which case the BSC multiplexer line control procedure will handle the selection/operation without any additional user involvement. The feature may also be used to share the modem between two or three multiplexers at a central site for back-up purposes. In this case, though both multiplexers may receive the incoming data, the user switchover procedures must ensure that both multiplexers are not transmitting simultaneously. Maximum: One. Field Installation: Yes.

MULTIPOINT TRIBUTARY (#5101). Used on each modem at tributary stations in a centralized multipoint network to compensate for channel distortion between the control modem and tributary modem. Not required on the modem at the control station. Equalizer adjustments are on the operator panel. Maximum: One. Limitation: Cannot be installed with Point-to-Point (#6101) or Control Station Specify #9101 or Control Station Equalizer (#1601). Field Installation: Yes. Specify: Telecommunication cord #7950.

POINT-TO-POINT (#6101). Used on modems at each end of a point-to-point private line (non-switched) channel to compensate for the channel distortion. Equalizer adjustments are on the operator panel. Maximum: One. Limitation: Cannot be installed with Multi-Point Tributary (#5101) or Control Station Specify #9101 or Control Station Equalizer (#1601). Field Installation: Yes. Specify: Telecommunication cord #7950.

SWITCHED NETWORK BACK-UP (#7951, 7952). Provides the capability of attaching the 3875 to a switched telecommunication network as a back-up to the private line (non-switched) channel. Operation is at 3600 bps with half-speed capability. A fixed-connection equalizer is provided for the back-up operation. A front panel switch permits operator selection of either facility or speed. Both facilities cannot be used simultaneously.

Note: To use this feature, operator intervention at the modem is required. Operator intervention, program modification, or both may be required on the system/terminal.

This feature can be used with BTAM programs for DOS, DOS/VS, OS, OS/VS1 and OS/VS2 in certain configurations. Additional customer program routines will be required, in existing BTAM programming, to utilize the capabilities of the Switched Network Back-up feature. Conditioning of the telecommunication local loop for transmission of data faster than 300 bps is required. Maximum: One. Field Installation: Yes. Specify: Telecommunication cord #9031 for #7951, 7952. Telecommunication cord #9032 for #7952. Prerequisite: Point-to-Point (#6101), Multi-Point Tributary (#5101), or Control Station Equalizer (#1601).

### Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Price (MRC)</th>
<th>Purchase (MMMC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternate Voice</td>
<td>#1051</td>
<td>$1050</td>
</tr>
<tr>
<td>Control Station Equalizer</td>
<td>1601</td>
<td>758</td>
</tr>
<tr>
<td>Fan Out</td>
<td>3901</td>
<td>28</td>
</tr>
<tr>
<td>Multi-Point Tributary</td>
<td>5101</td>
<td>2750</td>
</tr>
<tr>
<td>Point-to-Point</td>
<td>6101</td>
<td>28</td>
</tr>
<tr>
<td>Switched Network Back-up</td>
<td>7951, 7952</td>
<td>1,820</td>
</tr>
</tbody>
</table>

### Configuration Diagram

- **3875 Modem**
- **Point-to-Point**
- **Multi-Point Tributary**
- **Control Station**
- **Switched Network Back-up**
- **Fan Out**
- **Alternate Voice**

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REMOTE SWITCH ATTACHMENT (#6148). To attach the Two Channel Switch - Pair (#8170) to a configuration control panel. Maximum: One. Field Installation: Yes.

REMOTE SWITCH ATTACHMENT, ADDITIONAL (#6149). To attach the Two Channel Switch - Pair, Additional (#8171) to a configuration control panel. Maximum: One. Field Installation: Yes.

TWO CHANNEL SWITCH - PAIR (#8170). To attach each Storage Director to a second channel. Four unique channels may be switched, two to each Storage Director or the same two channels may be switched to both Storage Directors. The channels to be switched may be on the same or different processors. An available control unit position is required on each channel... see "Prerequisites" above. Switching is under program control. Each Storage Director can be dedicated to a single channel by means of an enable/disable switch. Maximum: One. Field Installation: Yes.

TWO CHANNEL SWITCH - PAIR, ADDITIONAL (#8171). Adds switching for two additional channels per Storage Director on a 3380 equipped with a Two Channel Switch - Pair (#8170), providing four channel switch capability for both Storage Directors. Up to eight unique channels may be switched, four to each Storage Director. Each Storage Director can be dedicated to a subset of the four attached channels by means of an enable/disable switch. Maximum: One. Field Installation: Yes. Prerequisites: Two Channel Switch - Pair (#8170). Limitation: When #8171 is installed, 3340/3344s and 3370s may not be attached.

Mail Call: $6,450 $10
Two Chnl Switch - Pr, Add'l 8171 470 460 17,200 35

Special Feature Prices:
- MRC 2 Yr Purchase AMMCR
- MLC
- MMMC/

SPECIFY
- Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #95915 for 240 V. Note: 240 VAC is compatible with 230 VAC systems.
- DASD Attachment Configuration: Two of the following must be specified; one for each Storage Director. The same specy feature may be specified twice. #9190 for 3340/3344, #9191 for 3370, or #9192 for 3330/3333/3350.
- Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray.

Prices: Mdl MRC 2 Yr Purchase AMMCR
3380 1 $1,704 $1,450 $62,350 $150

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IBM

3881 OPTICAL MARK READER

Purpose: Reads machine printed and/or handmarked data online into S/370 modls 115, 125, 135-3, 138, 145, 145-3, 148, 155 II and 158, or a 3031, 3032, 4331 or 4341 Processor, or offline to either of two magnetic media: diskette or compatible 8-track magnetic tape via a 3410 Magnetic Tape Unit modl 1.

For possible use with System/3, see GSD manual.

Model 1 For use with a S/370 modl 115, 125, 135-3, 138, 145-3, 148, 155 II or 158, a 3031, 3032, 4331, or 4341 Processor.

Model 2 Magnetic tape output via a 3410 Magnetic Tape Unit modl 1.

Model 3 Output data written on IBM diskette.

Highlights: The 3881 is a high speed optical mark reader. Data sheets are fed from a hopper with a 600-sheet capacity, through the reading area and directed to one of two output stackers. The main stacker has a capacity of 600 sheets. Sheets with detected errors are directed to a separate stacker with a 100-sheet capacity. Documents are stacked in the same sequence as they were entered in the hopper.

Data to be read can be placed on data sheets with ordinary #2 pencils, or by a 3203, a 1443 Printer, a 1443 Printer modl 1 or 2 with a 52 or 63 character type bar with arrangement A, H or K, a 1443 mdl N1 or 2203 Printer modl A1 with 52 or 63 character type bar, a 3251 or 5223 Printer, the 1403 or Printers. The marking positions which make up the standard dash ... see "Type Catalog.

Data Sheets: 3" x 3" to 9" x 12" up to 2,480 mark positions printed on a side. Preprinted mark positions are printed in rows of 40 positions on a 2" center for printer compatibility. Vertical spacing from top to bottom, or horizontally for printer compatibility. Rows and columns can be grouped into various combinations to form fields for the recording of source data.

Format Control Sheet: Used to load format control information into the 3881. Format control will define:

- The area of the input data sheet which is to be read.
- The marks allowed or discrimination required within each area.
- The sequence of the marking positions which make up the marking matrices.
- The output desired (numeric, alpha, alphanumeric or multiple mark format).
- The timing mark count which is expected on the sheets to be processed.
- BCD Read (optional feature) requirements.

From one to six formats, each consisting of one or more Format Control Sheets, can be read by the 3881 at the beginning of a job. After reading the last Format Control Sheet, the data sheets of the job to be processed are loaded in the 3881.

S/370 or 4300 Processors: Documents are read under computer control with speeds varying up to 6,000 documents/hour and 4,000 -- 8-1/2" x 11" pages/hour. Data is transferred to the CPU one page at a time on a fully buffered interrupt basis.

3410 Magnetic Tape Unit: Documents are read under control of the 3881 at speeds varying up to 5,400 documents/hour and 3,700 -- 8-1/2" x 11" pages/hour. The 3881 reads and fully buffers a document after which the data from the document is written as one record on tape. An optical feature, Dual Density, permits output at either 1,600 bpi PE or 800 bpi NRZI.

Diskette: Documents are read under control of the 3881 at speeds varying up to 5,700 documents/hour (3" by 3") -- and 3,800 pages/hour (8-1/2" x 11"").

The diskette drive and its control function are installed within the 3881 modl 3. Each magnetic diskette has a storage capacity of up to 1,898 data records (128 characters each) with as many as 19 data sets per diskette. The contents of each document read by the 3881 is written within one data record (a maximum of up to 128 characters). The diskette media written by the 3881 is compatible with such devices as the 3741, 3742, 3747 and the 3540.

PREREQUISITES:

Model 1: For S/370 modls 115 and 125, an available control unit position on the Multiplexer Channel (52423) ... see 3115 and 3125. For S/370 modls 135, 135-3, 138, 145, 145-3, 148, 155 IL, 158, or a 3031 or 3032 Processor, an available position on a byte multiplexer channel ... see 3115, 3135, 3135-3, 3136, 3145, 3145-3, 3146, 3155, 3158, 3031 or 3032. For a 4331 or 4341 Processor, an available position on a byte multiplexer channel ... see 4331 or 4341. One 3881 can be attached.

M 3881.1
May 79

Model 2: A 3410 Magnetic Tape Unit modl 1 equipped with either Single Density (#3211) or Dual Density (#3221) ... see 3410.

Model 3: None.

Supplies: For printing marks, use IBM ribbon 1136940 or 1136430 on the 1403 (all models) and 1136430 on the 3203; 422536 on the 1443/2203; 1136964 on the 3211; 1136990 on the 3101; or, equivalent ribbons capable of producing acceptable marks. For non-readable background printing, use ribbon 419101, or equivalent. Additional diskettes can be ordered

Format Control Sheets: 100 are provided with each 3881 ... additional pads of 50 may be ordered (G22X-916B).


Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz); #9902 or 208 V, or #9904 for 230 V ... must be consistent with system or 3410 voltage. FIELD INSTALLATION: Yes.

[2] Invalid Marking Condition Code: #9301 for Hex 3F (unprintable), or #9302 for Hex 7C (printable). FIELD INSTALLATION: Yes.

[3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for grey, or #9046 for white. FIELD INSTALLATION: Yes.

[4] S/370 Adapter: #9551. Required when a 3881 modl 1 is to be attached to a S/370 or a 4331 or 4341 Processor. FIELD INSTALLATION: Yes.


Kicktrips: #9431 ... if desired.

PRICES:

Mdl MAC/ MRC ETP/ MLC 2 yr Purchase MMMC

3881 1 $1,504 $1,290 $51,390 $138
2 1,369 1,165 46,800 109
3 1,657 1,410 59,940 131

Plan Offering: Plan A, Additional Use Charge Rate: 10%

Purchase Option: 50%

Metering: Mdl 1 - 1/0 Unit (Online) Per Call: 2
Mdl 2 - Meter on 3410 Useful Life Category: 2
Mdl 3 - Meter on 3881 Warranty: B

Model/Feature Additional Charge in lieu of AU Charge: 10%

Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Field installable ... must be serial number 20001 or above for field upgrade to Model 3.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

Model 2 to Model 1 $4,590
Model 2 to Model 3 13,140
Model 3 to Model 1 8,550

SPECIAL FEATURES

BCC READ (#1471). Provides, in addition to the basic read head, a second 12-position read head which allows the reading of high-density, preprinted binary coding. These heads will read as marks, digit 'ones', the character 'I' or a vertical bar (special character). Each BCC (Binary Coded Decimal) character read will be translated into its equivalent numeric EBCDIC code and transmitted to the CPU, the magnetic tape unit, or diskette one byte per character. Five of the twelve positions may contain BCD information which is weighted 1-2-4-8 parity from the reference (aligned) edge. The first row of BCC data following the start BCD Field must indicate which 5 of the 12 positions will contain BCC data for that field. If an invalid BCD character is read or an even parity error is detected, an invalid marking condition code is sent to the CPU, diskette, or magnetic tape unit. FIELD INSTALLATION: Yes.

DOCUMENT COUNTERS (#3450). Provides two 5-position counters to be incremented by one of the documents processed by the 3881. Counter 1 can be manually reset to zero. Counter 1 increments by 1 for each accepted document ... Counter 2 increments by 1 for each selected document. FIELD Installation: Yes.

DUAL DENSITY (#3550). [Model 2 only] Permits the 3881 to write on the 3410 Magnetic Tape Unit in either 800 bpi NRZI or 1600 bpi Phase Encoded modes. FIELD Installation: Yes.

Prerequisite: Dual Density (#3221) on the 3410 Magnetic Tape Unit modl 1.

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EXPANDED STORAGE (#3801). Provides for an additional 512 bytes of memory which may be required in those situations where the number of formats, fields and characters processed exceed the maximum number of positions available within the basic data store. **Maximum:** One. **Field Installation:** Yes. The formula for the determination of this condition is as follows:

$$5(F + n) + \text{BCD Bytes} + \text{Normal Bytes} + S + I-E$$

Where:
- **F** = Number of instruction fields used on all Format Control Sheets loaded.
- **n** = Number of different formats used with the alternate format capability (from 1 to 6).
- **S** = 7 if Serial Numbering (#6451) is installed and is being used -- otherwise, **S** = 0.
- **I** = Total number of bytes required to store image format data.

**SERIAL NUMBERING (#6451).** A device for printing consecutive serial numbers on the form being processed. Will print 7-digit number (2-digit batch and 5-digit serial number) which can be manually set to zero or any desired setting. A reading of the counter may be obtained and entered into the 3881 logic via a marked Serial Number Card. Various options exist for the printing of the number. A control switch provides either selective serial numbering based on stacker selection, or a 7-digit batch number without unit advancing. Concurrent with printing, the number will be transmitted to the CPU or the output tape unit or the diskette.

**Supplies:**
- Ribbon -- uses IBM purple ribbon, 1136844 or equivalent.
- Serial Number Card -- packets of 100 may be ordered (SX21-9169). **Field Installation:** Yes.

---

### Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>ETP/</th>
<th>MAC/</th>
<th>MLC</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ETP/</td>
<td>MAC/</td>
<td>MLC</td>
<td>Purchase</td>
</tr>
<tr>
<td></td>
<td>MRC</td>
<td>2 yr</td>
<td>Purchase</td>
<td></td>
</tr>
<tr>
<td>BCD Read</td>
<td>#1471</td>
<td>61</td>
<td>52</td>
<td>$2,150</td>
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<tr>
<td>Document Counters</td>
<td>3450</td>
<td>22</td>
<td>19</td>
<td>853</td>
</tr>
<tr>
<td>Dual Density</td>
<td>3550</td>
<td>156</td>
<td>133</td>
<td>5,410</td>
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<tr>
<td>Expanded Storage</td>
<td>3801</td>
<td>61</td>
<td>52</td>
<td>2,150</td>
</tr>
<tr>
<td>Serial Numbering</td>
<td>6451</td>
<td>183</td>
<td>156</td>
<td>6,325</td>
</tr>
</tbody>
</table>

**Document Inspection Gauge** -- one is furnished with each 3881 as a Customer Engineering tool. Used for checking printing alignment on data sheets. Additional gauges, P/N 2450145, are $35 each.

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3886 OPTICAL CHARACTER READER

Purpose: Optically reads OCR-A font and OCR-B font machine printed numeric digits, alphanumeric characters, and handprinted numeric digits from a wide variety of forms. Attaches online to any virtual storage S/370 Processor, or any 4300 Processor, or offline to a 3410 Magnetic Tape Unit mdl 1 which provides compatible 9-track magnetic tape.

Model 1 -- For use with any virtual storage S/370 Processor, or any 4300 Processor.

Model 2 -- For use offline with a 3410 Magnetic Tape Unit mdl 1.

Model Changes: Field Installable.

Highlights: The 3886 is a general purpose optical character recognition reader designed to meet a broad range of data entry requirements. It will read multiple lines of print from forms ranging from 3 to 9 inches wide (direction of printing) and from 3 to 12 inches long. Allowable widths range from 16" to card stock ... see "Documents and Printing.

Forms enter the 3886 from the input hopper which has a capacity of one inch of forms. The forms are advanced by line (maximum 3 lines per inch) past a read station which incorporates a total of 120 character scanning system to collect character images. These images are analyzed by recognition programs within the 3886 recognition and control processor. After a complete line has been recognized, certain user specified editing and output formatting functions take place. The line output is then transmitted to the S/370, any 4300 Processor, or to a 3410 Magnetic Tape Unit mdl 1.

After the complete form has been read it is directed to one of two output stackers, each having a capacity of one inch of forms.

The recognition, machine control, and FE diagnostic microprograms for the 3886 are supplied on an internal direct access storage device. The use of these programs singly or in combination is dependent on the configuration of the 3886 ... see "Configuration.”

Input from several different sources can be read on the 3886. The "Table of Acceptable Characters and Printing Devices” below shows the characters which are acceptable from typewriters, high speed printers, lithograph, or, in the case of Numeric Handwriting, a pencil.

Model 1 -- The online 3886 mdl 1 provides buffered time-independent attachment to S/370 mdl 115 and 125 via an optional multiplexer channel, or to S/370 mdl 135, 135-3, 138, 145, 145-3, 148, 155 II, 158, 165 II, and 168 via byte multiplexer, block multiplexer or selector channels, or to a 3031, 3032, 3033, 4341 or 4331 Processor via byte multiplexer or block multiplexer channels. Forms are read and other 3886 functions are performed under S/370 or 4300 Processor program control. The basic 3886 mdl 1 consists of 24K bytes of Instruction Storage for machine control and recognition microprogram storage.

Model 2 -- The offline 3886 mdl 2 operates independently of any Processor. It produces compatible 9-track magnetic tape output via the attachment of a 3410 Magnetic Tape Unit mdl 1. The user indicates form characteristics and processing requirements with Line/Field and Job Specification Sheets. These are translated on a special 3886 run into the necessary Form Control information, and then stored on the internal DASD for subsequent use.

Up to eight different form layouts (all one size) can be intermixed within a batch (run). Certain editing and validation functions normally performed by the host Processor and also provided on the 3886 include self-check digit (Modulus 10) calculation, column or cross-foot total verification, and field to field comparison. The results of these functions can be specified to control stacker selection, Serial Numbering and Line Marking features if they are installed ... see "Special Features.” The basic 3886 mdl 2 contains 32K bytes of Instruction Storage for machine control and recognition microprogram storage.

Speed -- document throughput depends upon 3886 model, document length, number and type of characters read, the amount of output editing and formatting specified, and the user S/370 or 4300 Processor program model (model). The model 1 speeds range from approximately 5,800 three-inch long single line 8 character machine printed turnaround documents per hour, to approximately 330 typewritten 8-1/2" x 11" pages with 12 characters/line, 2 pages per line generally.

On the model 2, speeds for the same forms range from approximately 5,200 documents to approximately 300 pages per hour. SRL GAZ1-9148 contains formulas which should be used to determine throughput for specific forms.

Documents and Printing -- the input forms and printing to be read by the 3886 must conform to the established specifications described in SRL GAZ1-9148. Only those ribbons (see "Supplies") and background inks specifically meeting the outlined spectral criteria will give satisfactory performance. Certain restrictions apply to document sizes, weights, and combinations thereof. These are discussed in SRL GA21-9148.

Supplies -- providing maximum flexibility in background ink colors and intensities requires that ribbons used for printing 3886 input are carefully selected. The following, or their equivalents, should be used: For Film Ribbon Selective 1136310 or 1136391 ... for Fabric Ribbon Selective 11361318 ... for 1403 (all models) 1136430 ... for 3211 ribbon 1136627 for 20-24 lb. Bond and 1136626 for all heat papers ... for 3211 (mdls) 1136430 ... for 5211 mdl 2 1299243. Ribbons not having similar characteristics may result in reduced recognition performance and/or reduced ribbon life.

PREREQUISITES:

Model 1 -- an available control unit position on the Multiplexer Channel (#5248) of a S/370 mdl 115 or 125, or a byte multiplexer or block multiplexer or selector channel of a S/370 mdl 135; 135-3, 138, 145, 145-3, 148, 155 II, 158, 165 II, 168, or a byte multiplexer or block multiplexer channel on a 3031, 3032, 3033, 4341 or 4331.

Model 2 -- a 3410 Magnetic Tape Unit mdl 1 ... if Single Density (#3211) is on the 3410, a Single Density Tape Adapter (#6490) is required on the 3886 ... if Dual Density (#3221) is on the 3410, a Dual Density Tape Adapter (#6495) is required on the 3886. See "Special Features.”

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9909 for 230 V ... must be consistent with system voltage. FIELD INSTALLATION: #3176 Yes.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9046 for white.

[3] Upending Kit: #9840, if required ... loan basis on initial machine order only, remains property of IBM. Dimensions will be 29-1/2" wide, 60" long and 76" high.

[4] 3211/5211 Compatibility: #9701, if required ... only if predominate reading 2211 or 5211 generated documents.

PLAN OFFERING:

Plan Offering: Plan A, Additional Use Charge Rate: 10% Purchase Option: 40% Warranty: B Useful Life Category: 2 Per Call: 2 Metering: Mdl 1 -- 1/0 Unit (Online) Mdl 2 -- 1/0 Unit (Offline) Model/Feature Additional Charge in lieu of AU Charge: 10% Termination Charge Months: 5 Termination Charge Percent: 25% Upper Limit Percent: 0%

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

Model 1 to Model 2 ..... $6,390

SPECIAL FEATURES

DATA STORAGE, ADDITIONAL (#3210). OCR-B Font and "Buffering" require this feature to handle the more complex character shapes which appear in these fonts.

Maximum: One. Field Installation: Yes.

HOPPER AND STACKER CAPACITY, ADDITIONAL (#4520).

The standard hopper and two stackers on the 3886 each have a capacity of one inch of forms. This feature adds the motors, sensors, etc., to increase that capacity to approximately 4 inches in each. Field Installation: Yes.

INSTRUCTION STORAGE, ADDITIONAL (#4610). The recognition microprograms for alphanumeric machine printed fonts and Numeric Handprinting require storage capacity greater than the basic models of the 3886, as do combinations of fonts. This feature provides the necessary additional storage increments of 5K bytes. Up to nine of these features may be added ... see "Configuration.” Field Installation: Yes.

LINE MARKING (#4720). Provides a four-position fixed slug printer (1, 2, 4, and 8) which prints 15 different codes to be used as an aid to error correction procedures. It is used to indicate field location or error type information in the margin of lines requiring corrective action. It will also provide page marking capability to indicate user controlled post-processing document handling information. Line marking is under program control on the mdl 1 and is controlled by coding on the specification sheets on mdl 2. Ribbons: Line marking may be done with a purple ribbon (414499) or equivalent if marked documents are to be re-processed through the 3886. Otherwise a black ribbon (414491) or equivalent may be used.

Field Installation: Yes. Prerequisite: Numbering/Marking Adapter (#5340).

NUMBERING/MARKING ADAPTER (#5340). Provides a group of common parts necessary for the installation of Serial Numbering...
88 Optical Character Reader (cont'd)

NUMERIC HANDPRINTING (#5360). Provides the additional machine circuits to read the handprinted numbers 0-9 and the letter X. For optimum operation, character shapes and spacing should conform to the basic rules of handwriting as outlined in IBM publication GA21-9148. Handprinting should be performed with ordinary #2 pencils or grade HB fine line lead for mechanical pencils. The NHP feature includes the ability to read forms supplied prepared on an equivalent 3/16" font numbers 0-9. The feature provides two modes of operation, normal and verify. The appropriate mode can be selected on a field-by-field basis depending on the critical nature of the data, the circumstances of form preparation, and the level of available control techniques.

Field Installation: Yes. Prerequisites: Data Storage, Add'l (#3210) and sufficient Instruction Storage, Add'l (#4610) - see "Configurator."" CONFIGURATOR

All 88 Optical Character Readers will be shipped containing an internal DASD. That device will contain all of the recognition microprograms for OCR-A font, OCR-B font and NHP. [See "Table of Acceptable Characters." This configurator shows which features are necessary in order to utilize all valid combinations of those recognition programs.

From the following table, find the combination of fonts which will appear within any one batch (run) of input forms. The features shown on that line are required. If any other batch (run) will contain another font, a greater quantity of #4610 may be required to cover the maximum combination of fonts for all batches to be run in various applications.

<table>
<thead>
<tr>
<th>Numeric OCR-A</th>
<th>Numeric OCR-B</th>
<th>Alphameric OCR-A</th>
<th>Alphameric OCR-B</th>
<th>Numeric Handprinting</th>
<th>Instruction Storage, Add'l #4610</th>
<th>Numeric Handprinting</th>
<th>Data Storage, Add'l #43210</th>
</tr>
</thead>
<tbody>
<tr>
<td>X X X</td>
<td>X X X</td>
<td>X X X X</td>
<td>X X X X</td>
<td>X X X X X</td>
<td></td>
<td>X X X X X</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Equal or smaller size combinations of fonts will operate on machines with the required features (#5360 and #3210).

Example: User batch to be processed will contain Alphameric OCR-A font and Numeric Handprinting. This requires the following features: Quantity of 5 of #4610 plus 1 of #5360 and 1 of #3210.

Other batches this user will be able to run can include the following fonts or combinations of fonts:

- Numeric-A
- Numeric-B
- Numeric-A and NHP
- Numeric-B and NHP
- Alphameric-B
- Alphameric-A and Alphameric-B

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DP Machines

M 3886.2

May 79
**3886 Optical Character Reader (cont'd)**

**TABLES OF ACCEPTABLE CHARACTERS AND PRINTING DEVICES**

**OCR-A FONT, SIZE 1 (1)**

<table>
<thead>
<tr>
<th>Numeric</th>
<th>Numeric</th>
<th>Alphameric</th>
<th>Additional Characters from IBM Selectric® Typewriter (or equivalent) Only.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
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</tr>
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<td>7</td>
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</tr>
<tr>
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<td>8</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>J</td>
<td></td>
</tr>
<tr>
<td>&gt;</td>
<td>&gt;</td>
<td>K</td>
<td></td>
</tr>
<tr>
<td>&lt;</td>
<td>&lt;</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td></td>
</tr>
</tbody>
</table>

(1) The division of characters into sets above refers to 3886 recognition capability. The appropriate type catalog arrangements should be referenced for high speed printer output character sets.

(2) These characters are recognized in mode 1 alphameric set. **

(3) All these characters are recognized only on mode 2 alphameric set except Group Erase, @ and # which are recognized in the numeric set also.

(4) The LVM (long vertical mark) is recognized in all OCR-A character sets. The LVL (preprinted long vertical line) is also recognized. **

(5) The timing mark dash (---) can be substituted for a non OCR-A font graphic (6) for the purpose of printing timing marks. See “Type Catalog” for details.

(6) The OCR Print Package (5450), on the 3211 is a prerequisite for OCR applications. Use of the Reread On Reject capability and 20-24 lb. Bond is recommended for optimum performance. When other papers are used, customer testing should be performed to assure adequate reading performance.

(7) Minimum paper weight for documents produced on the 3800 is 20 lb.

(8) With the 5211, use of Reread on Reject and 20-24 lb. single part forms are required.

**OCR-B FONT, SIZE 1 (1) (6)**

<table>
<thead>
<tr>
<th>Numeric</th>
<th>Numeric</th>
<th>Alphameric</th>
<th>Additional Characters from IBM Selectric® Typewriter (or equivalent) only. These can be recognized in all OCR-B Font Character Sets.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>A</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>6</td>
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<td>I</td>
<td></td>
</tr>
<tr>
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<td>9</td>
<td>J</td>
<td></td>
</tr>
<tr>
<td>&lt;</td>
<td>&lt;</td>
<td>K</td>
<td></td>
</tr>
<tr>
<td>&gt;</td>
<td>&gt;</td>
<td>L</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td></td>
</tr>
</tbody>
</table>

(1) The division of characters into sets above refers to 3886 recognition capability. The appropriate type catalog arrangements should be referenced for high speed printer output character sets.

(2) The LVM (long vertical mark) is recognized in both numeric and alphameric OCR-B but can only be preprinted or typed. The LVL (long vertical line), a special case of the LVM, can also be recognized. **

(3) The timing mark dash (---) can be substituted for the greater than (>) for the purpose of printing timing marks. See “Type Catalog” for details.

(4) The OCR Print Package (5450), on the 3211, is a prerequisite for OCR applications. Use of the Reread On Reject capability and 20-24 lb. Bond is recommended for optimum performance. When other papers are used, customer testing should be performed to assure adequate reading performance.

(5) This is compatible with the European Computer Manufacturers Association revised OCR-B Font published in the Standard ECMA-11


[reverse side is blank]
IBM 3890 DOCUMENT PROCESSOR

Purpose: Reads magnetically inscribed data from card and paper documents into any virtual storage S/370 Processor except 3115 or 3125 via the byte multiplexer or block multiplexer channel, or a 4331 or 4341 Processor via a byte multiplexer or block multiplexer channel. Can be used offline for document sorting.

Models: The 3890 is available in twelve models;

- **Model A1** -- six stackers
- **Model A2** -- twelve stackers
- **Model A3** -- eighteen stackers
- **Model A4** -- twenty-four stackers
- **Model A5** -- thirty stackers
- **Model A6** -- thirty-six stackers
- **Model B1** -- six stackers
- **Model B2** -- twelve stackers
- **Model B3** -- eighteen stackers
- **Model B4** -- twenty-four stackers
- **Model B5** -- thirty stackers
- **Model B6** -- thirty-six stackers

Specifications:

- **Length**: 4.85 to 8.75 inches (123 to 223mm).
- **Width**: 2.75 to 4.17 inches (70 to 106mm).
- **Thickness**: .0025 to .007 inches (.064 to .175mm).

Carrier documents containing mutilated documents with a total thickness up to .014 inches (.356mm) will also be transported.

Base Weights -- 16 to 44 lbs. (basic weight is the weight of 500 sheets of 17" x 22" paper), 60 to 165 grams per square meter.

Grain -- long grain or short grain, except for 16 lb. paper, which must be long grain.

**Bibliography**: Machine and Programming Description, GA24-3612.

**SPECIFY**: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9046 for white.

[3] Upending Kit: #9840, if required ... loan basis, remains the property of IBM.


[6] Tool Kits: Required for CE maintenance. For Rental Customer -- specify on first 3890 order for a customer. If required for a multiple machine installation, an additional Tool Kit(s) is available.

Purchase Customers -- specify on each 3890 machine order. When installed rental 3890s are purchased, a Tool Kit is to be ordered on a no-charge for each machine. Specify: #9766 or #9767 for base machine ... #9768 for Item Numbering/Endorsing (#4666).

---

The 3890 is a buffered modular pocket reader sorter which is time independent. Documents are read at a minimum rate of 2400 six-inch documents per minute. Actual throughput depends upon length of document. The formula for determining approximate average rated throughput per minute is: The percentage of non-card stock checks x (19200/average document length which is 6" or greater plus 2.3) + the percentage of card stock checks x (1907). The primary component of the 3890 is the feed module which contains the input hopper, recognition circuits, logic to determine stacker selection, merge feed, options when installed and operator set-up and run panels.

Input Hopper -- holds approximately 4800 documents and permits convenient, continuous loading. A jogger is built into the hopper to eliminate jogging as a separate operation.

Merge Feed -- permits the merging of documents into the normal input stream from a separate hopper. Document capacity is 600. Document merging is controlled by the user program. For example, as part of job initialization, the user can specify the approximate number of documents to be stacked in each pocket before a document is fed from the hopper to that pocket. The 3890 will maintain a document count for each pocket. The merge function eliminates the need for programmed pocket lights. Limitation: Does not permit the 3890 to function as a collator.

Logic and Control Section -- is initialized by the CPU when online and by a removable diskette when offline. Initialization determines the fields to be read, length of the fields, starting number for the item numbering feature, merge feed controls, if image processing is to be performed, the stacker control instruction algorithm to be used, endorser requirements, and whether the symbol error correction option is to be used. With the symbol error correction option, the 3890 performs extensive logical analysis to determine if unreadable symbols can be replaced by internally-generated field defining symbols. The 3890 performs all stacker select determinations independent of CPU control and transfers blocked data records to the CPU. Due to the logical capability, the following functions are standard "programmable" ... split field ... self-check number verification ... multiple column control ... base number conversion for fine sorting.

Stackers -- each pocket holds approximately 800 to 1000 documents. The operator can unload all but the last 200 - 300 documents without stopping the 3890. Pocket warning lights alert the operator when a specific pocket is full. The reject stacker is the first stacker ... the stacker closest to the input hopper. Racks for output trays are above each stacker.

Documents -- E13B magnetic characters, print quality, and code-line arrangement on the documents must meet the specifications recommended by the American Bankers Association. Intermixed paper and card documents within the following specifications can be processed:

- **Length**: 4.85 to 8.75 inches (123 to 223mm).
- **Width**: 2.75 to 4.17 inches (70 to 106mm).
- **Thickness**: .0025 to .007 inches (.064 to .175mm).

Carrier documents containing mutilated documents with a total thickness up to .014 inches (.356mm) will also be transported.

---

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DOCUMENT PROCESSOR (cont’d)

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

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<thead>
<tr>
<th>From To</th>
<th>A1</th>
<th>A3</th>
<th>A4</th>
<th>A5</th>
<th>A6</th>
</tr>
</thead>
<tbody>
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<td>A1</td>
<td>$43,000</td>
<td>$86,000</td>
<td>$129,000</td>
<td>$172,000</td>
<td>$215,000</td>
</tr>
<tr>
<td>A2</td>
<td>43,000</td>
<td>86,000</td>
<td>129,000</td>
<td>172,000</td>
<td>215,000</td>
</tr>
<tr>
<td>A3</td>
<td>43,000</td>
<td>86,000</td>
<td>129,000</td>
<td>172,000</td>
<td>215,000</td>
</tr>
<tr>
<td>A4</td>
<td>43,000</td>
<td>86,000</td>
<td>129,000</td>
<td>172,000</td>
<td>215,000</td>
</tr>
<tr>
<td>A5</td>
<td>43,000</td>
<td>86,000</td>
<td>129,000</td>
<td>172,000</td>
<td>215,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>From To</th>
<th>B1</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>B5</th>
<th>B6</th>
</tr>
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<tbody>
<tr>
<td>B1</td>
<td>$45,950</td>
<td>$88,950</td>
<td>$131,950</td>
<td>$174,950</td>
<td>$217,950</td>
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<tr>
<td>B2</td>
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<td>174,950</td>
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<tr>
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<td>131,950</td>
<td>174,950</td>
<td>217,950</td>
<td>260,950</td>
</tr>
</tbody>
</table>

SPECIAL FEATURES

ITEM NUMBERING/ENDORSING (#4666). Provides the capability of printing an 8-digit number and/or a full endorsement on the back of each document. The starting item number and 1 of 3 print locations is determined by the user program at initialization. The number can be incremented on any document cycle based on the user-provided stacker control instruction parameters for the run. The number can be configured by the user at installation to be a combination of batch and serial number or serial number only. Vertical location of the item number is specified by the customer and is normally set at the plant.

During run initialization, the user specifies whether endorsing is active and one of three horizontal print positions. Vertical location of endorsement is specified by the customer and is normally set at the plant. The design of the endorser facilitates operator changing of endorser legends for users who have a requirement to print different endorsements. The date portion of the endorser is set by the operator. Specify: #9167 for endorsement at top, or #9168 for center, #9379 for number at bottom; or #9378 for center. Color of endorser ink to be used -- #9145 for black, #9147 for purple, #9148 for red, or #9149 for blue. Field Installation: Yes.

MICROFILMING (#5111). Provides the capability of microfilming items, either front and back (duplex) or front only (duo), being processed on the IBM 3890. Items are selectively filmed under program control at 3890 document speeds. An eight-digit number can be exposed on the film for every other document image recorded on film. The eight number positions can be split into two number fields which can be incremented or reset on any document cycle under stacker control instruction parameters for the run. During run initialization, the user specifies whether microfilming is active, the mode of filming, and the starting eight-digit number. A frame mark is recorded on film for each document image for image counting during retrieval. The camera provides a reduction ratio of 50 to 1 and a resolution of 120 lines per millimeter. The film is advanced by a capstan drive system based upon the document width to maximize the use of film. The film cassette, a purchase only item (see M 10000 pages), provides space for take-up of the film as well as the film supply. Capacity of the cassette is 2,000 feet of .0027 polyester thin base film. Loading and unloading of film from the cassette into the film transport is automatic under operator control. Approximately 380,000 front and back images of an average intermix of documents can be recorded on 2,000 feet of film. The film is spaced six inches every 215 feet to facilitate splicing; if a 49 inch space is required, specify #9177. The film to be used is 16mm unperforated thin base microfilm which must be ordered on cores. Disclosure specifications covering the film, cassette, and core on which the film must be wound, are available from IBM Industry Relations/ Product Information, Dept. 767, CHQ, Old Orchard Road, Armonk, N. Y. 10504. Film must be ordered on cores (Part No. 2648086 or equivalent) with an 1/8 inch diameter hole center punched approximately seven feet from each end of the film. Field Installation: Yes.

S/370 ATTACHMENT (#6370). Permits attachment to any virtual storage S/370 Processor or 4300 Processor via the byte multiplexer channel or the block multiplexer channel. This feature is required on each 3890 attached to a S/370 or any 4300 Processor. Maximum: One. Field Installation: Yes.

††† For the purpose of minimizing overprinting of item numbers and endorsements, 390s ordered for Federal Reserve Banks should specify #9167 for endorsement at top and #9378 for item number at center. All other machines should specify #9168 for endorsement at center and #9379 for item number at bottom.
**Purpose:** Magnetically reads the E13B codeline inscribed on card and paper documents, optically reads machine printed and intermixed handwritten numeric amounts from checks and/or deposit tickets, inscribes the amounts in the MICR code-line, and sorts into multiple stackers under control of the attached S/370 Model 125-2, 125-3, 148, 155 II, 156 II, 168, or a 3031, 3032 or 3033 Processor, or 4331 or 4341 Processor.

**Model 1** Six stackers

**Model 2** Twelve stackers

**Highlights:** The 3895 is a multi-stacker document reading and inscribing device which is time independent. Documents are processed at a rated speed of 525 six-inch documents per minute. Actual throughput depends on a number of factors including document type, size, mix and quality; number of fields scanned and/or inscribed; number of characters printed; complexity of the software; CPU load and priority of processing. The transport system of the 3895 consists of the primary hopper, merge hopper, MICR I, bar code reader, OCR reader, printer/inscriber, MICR II, endorser, and stackers.

**Input Hopper** -- holds approximately 5-1/2 inches of documents in a gravity feed permitting non-stop feeding. The feeding and processing of the documents are controlled by the host CPU application support program. The maximum size document which can be processed is the 3895 is 4-1/8 inches high and 9 inches long.

**Merge Hopper** -- permits pinpoint merging of documents into the transport path as it is read. The feeding and inscribing functions except MICR I read and bar code read can be performed on documents from the merge feed. Document capacity of approximately 6 inches is possible.

**MICR I** -- the preprinted and/or MICR codeline is read at this station using IBM's latest single gap reading technique. Data read at this station is stored in a buffer and shifted in the buffer as the document moves through the transport. This station also contains a bar code reader. Special type documents such as deposit documents may be recognized by a unique MICR field or a preprinted form which serves to identify these documents according to the pre-specified identification parameters is the Document Identification Handler. The document is read from the MICR I station and will be held if the OCR read station is not ready.

**OCR Read** -- The printed or handwritten numeric amounts are optically read at this station. Up to three fields of numeric information from each document may be read and stored in the buffer for transmission to the CPU. Three types of documents will pass under the scanner and will be treated differently based on the type of document to be read as determined at the MICR I and bar code station.

**Document Type -- Check:** Document will be scanned to find the amount location. The printed or handwritten amount will be scanned and presented to the recognition logic. Amounts when recognized will be placed in the buffer along with codeline data read at MICR I.

**Document Type -- Deposit:** The scanner will read individual line items on the deposit ticket. All line items read will be stored internally in the 3895 and used to compare each check or debit document during the scan process to assist in recognition of the amount. The 3895 recognizes the last item read on the deposit ticket or the last line of the last deposit slip in a multiple deposit slip transaction as a total and inserts this in the associated buffer along with the codeline data read at MICR I.

**Document Type -- Tape Listing:** Adding machine tape lists from customers must be converted to machine processable document sizes. The 3896 Tape-Document Converter performs this operation. Individual line items will be scanned and stored internally in the 3895 and used to compare each check or debit document during the scan process to assist in recognition of the amount. The last item on each list document will be placed in the associated buffer.

**Buffer:** At the completion of the OCR scan process, a data record for each document is stored in a buffer. This record consists of control information and document data. The control information consists of type, format and size of document and validity status of MICR and OCR fields.

**Data section consists of the MICR and OCR data fields read from the document. The contents of the buffer are sent to the CPU upon a request issued by the user application program.**

The 3895 waits for the user application program to process the contents of the buffer and send an output record back to the 3895. The output record must contain data and control information. The control information will contain the stacker number and instructions to inscribe and print. The data will consist of the amount, the transaction code, and/or other data to be inscribed, and the serial number to be printed.

**Print:** Two types of printing occur at this station. Data to be printed is stored in the buffer. The inscriber prints E13B magnetic ink characters as defined in the ANSI Standards X3.2 -- 1970 and X3.3 -- 1970. Any two fields may be inscribed in one pass -- amount and process codes are considered one field. The serial number printer prints at eight characters per inch and has the capability of printing up to 25 positions on the face of the document. The printing by the serial number printer in a field of more than 15 positions or the inscribing of fields other than the amount field will degrade throughput. Numeric digits 0-9, $, and symbols may be printed. Blank symbols will not be produced.

**Limitations:** $ may not be printed in positions 1, 2, and 15. The symbol $ may not be printed in positions 1, 4, and 15. Any two fields may be inscribed at this station using the 3895. The 51-column card may contain a maximum of 8 positions. Inscribing the auxiliary on-us field requires a minimum of 7-3/8 inchlength documents.

**MICR II** -- The function of this station is to verify that the E13B data inscribed is machine processable.

**Endorser** -- Documents can be endorsed in one of six fixed positions on the back of the document. During run initialization, the user specifies whether endorsing is active and one of three horizontal print positions. Vertical positional location of endorsement is specified by the customer and is normally set at the plant. The design of the endorser facilitates operator changing of endorser legends for users who have a requirement to print different endorsements. The date portion of the endorsement is set by the operater.

**Stackers:** -- Model 1 has six stackers and Model 2 has twelve stackers, each having a total capacity of 2-1/2-1/2 inches of documents. Stackers are used to hold documents in position until they are ready for further processing. Depending on the type of documents, stackers pairs 1 and 2, 3 and 4, and 5 and 6 may be used in an overflow mode. Under this mode, only the odd numbered stacker selection is valid. Documents overflow from a full stacker to other pocket in the pair if that stacker is not full. Stackers 1 and 7 are at the top. Stackers 7 through 12 cannot be used in overflow mode.

**Document Path** -- The document path is generally in the shape of a broad U, starting at the primary hopper located near the upper right corner, as viewed from the front of the machine. First, the document is picked up from the hopper and fed to the pre-scan station. Documents are then fed upward the stackers. The merge documents follow the same path except that they are fed from the merge hopper, which is located to the immediate left of the primary hopper and are sent directly into the scanner station.

**Deposit Slip First** -- The 3895 internally stores the individual line item amounts from a deposit slip or item list (adding machine tape) and compares each check to the stored amounts. This reduces substitutions and improves the OCR performance. Therefore, deposits must be trayed so that a line item immediately precedes the items to be read. If the checks are listed on the deposit slip, they should follow the deposit slip. If the checks are listed on an adding machine tape, the tape must be converted to a table form document processable by the 3895 and identified by a bar code number. The segments of the tape should be kept in order and trayed immediately preceding the checks listed.

**3895 Document Designer & Printer Kit** -- IBM 3895 Document Designer and Printer Kit contains camera-ready artwork of OCR field guide areas described in the Document Design Guidelines. The kit is used to design and create final artwork for 3895 input documents. The artwork is printed on a stable-base material. The IBM Document Designer and Printer Kit, SX24-3642, may be purchased by the customer from IBM for $96 each. For additional documentation, see the 3895 Document Design Guidelines, GA24-3640.

**Supplies:** MICR ribbon and fabric ribbon

**Documents: E13B magnetic characters, print quality and code-identification management on the documents must meet the specifications recommended by the American Bankers Association. Intermixed paper and card documents within the following specifications can be processed:

- **Length:** 123 to 223mm (4.85 to 8.75 inches).
- **Width:** 70 to 106mm (2.75 to 4.17 inches).
- **Thickness:** 0.76 to 1.78mm (0.003 to .007 inches).

**Base Weights:** 16 to 44 lbs (basic weight is the weight of 500 sheets of 17" x 11" paper), 60 to 165 grams per square meter.

**Grain:** Long grain or short grain, except for 16 lb paper, which must be long grain.
IBM

3895 Document Reader/Inscriber (cont'd)

Publications:
- General Information - GA24-3645
- Input Document Design Guidelines - GA24-3640
- Input Document Designer and Printer Kit - SX24-3642
- Installation Manual/Physical Planning - GA24-3641
- Machine & Programming Description - GA24-3620.
- Field Coordinate Gauge - GX24-3646

Specify: [1] Voltage (AC, 3-phase, 4-wire, 60 Hz): #9003 for 208 V, or #9005 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, or #9046 for white.

[3] Upending Kit: #9840 if required ... loan basis, remains property of IBM.


[5] Endorsing Ink: #9145 for black, #9147 for purple, #9148 for red, or #9149 for blue.

[6] Tool Kits: Required for CE maintenance. For Rental Customer -- specify on first 3895 order for a customer. If required for a multiple machine installation, an additional Tool Kit(s) is available for Purchase Customer -- specify on each 3895 machine order. When installed rental 3895s are purchased, a Tool Kit is to be ordered for each machine. Specify: #9796 for base machine ... in addition, #9797 is required for Microfilming (#S110).

Model Changes: Field Installable.

MODEL UPGRADE PURCHASE PRICE (There are no additional installation charges.)

Model 1 to Model 2 ......$15,000

SPECIAL FEATURES

MICROFILMING (#S110). Provides the capability of microfilming items, either front and back (duplex) or front only (duo), being processed on the 3895. Items are selectively filmed under program control at 3895 document speeds. An eight-digit index number, determined by the user in his program, will be exposed on the film for every other document image recorded on film. During run initialization, the user specifies whether microfilming is active and the mode of filming. A frame mark is recorded on film for each document image for image counting during retrieval. The system based upon the document width to maximize the use of space is required, specify #9977. The film to be used is 16mm unperforated thin film. The 3896 is an electrostatic dry copier with a semiautomatic tape feed that will accept single part original noncarbon back adding machine deposit tapes and copy them by tape or tape section onto 95.116mm x 222.250mm (3.666" x 8.750") TC tickets. The 3896 will accept an input tape with a basic weight of 12 lb to 24 lb and a minimum length of 88.9mm (3.5") and a width of 3.81mm to 101.6mm (1.5" to 4.0"). Tapes less than 88.9mm (3.5") in length may be manually copied. During the copy cycle the TC tickets are non-mechanically printed with item reference track, tape number, copy number, and a bar code. The bar code is used to identify the document to the 3895 and the other information provides audit trail and balancing aids. TC tickets can be automatically inscribed on the 3895 with a customer account number and identified with both MICR and serial number printing to facilitate further handling and processing on reader sorters.

Speed: A tape feeds in increments (copy cycles) of about 203.2mm (8")

A tape longer than 203.2mm requires additional tape feed and copy cycles. After the first copy cycle which takes 8 seconds, consecutively inserted short tapes or sections of the same tape are copied in 2.4 seconds.

Stacker: At the end of the cycle, a TC ticket is fed into a reversing stacker which stacks the tickets in the correct order for processing in the 3895. Tapes will be ejected into an open container that can be emptied as required.

Operator Controls: Controls are provided among which is a variable control to accommodate varying tape paper reflectances.

Paper Supply: A paper supply drawer holds a 95.116mm (3.666") wide roll of paper supplying paper for the TC tickets. Paper is available from IRD.

Toner: A special cartridge supplying the toner for the 3896 is available.

Manuals:
- Installation Manual/Physical Planning - GA24-3643.

Supplies:
copy paper and toner cartridges

Power Requirements: Refer to Physical Planning Manual.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>#5110</th>
<th>Monthly Lease Charge (5 Yr)</th>
<th>Monthly Use Charge Rate</th>
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<tbody>
<tr>
<td>Microfilming</td>
<td></td>
<td>$2,725</td>
<td>$0.019/100 dcmnts</td>
<td>$100,000</td>
</tr>
<tr>
<td>Maintenance</td>
<td>$120</td>
<td>$0.019/100 dcmnts</td>
<td></td>
<td></td>
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</table>

3896 TAPE-DOCUMENT CONVERTER

Purpose: A stand-alone console unit used to convert adding machine tapes into ABA check size documents (tape copy tickets) for input to the 3895 Document Reader/Inscriber. Tape copy (TC) tickets provide deposit information that improves the performance of the 3895.

Highlights: The 3896 is an electrostatic dry copier with a semiautomatic tape feed that will accept single part original noncarbon back adding machine deposit tapes and copy them by tape or tape section onto 95.116mm x 222.250mm (3.666" x 8.750") TC tickets. The 3896 will accept an input tape with a basic weight of 12 lb to 24 lb and a minimum length of 88.9mm (3.5") and a width of 3.81mm to 101.6mm (1.5" to 4.0"). Tapes less than 88.9mm (3.5") in length may be manually copied. During the copy cycle the TC tickets are non-mechanically printed with item reference track, tape number, copy number, and a bar code. The bar code is used to identify the document to the 3895 and the other information provides audit trail and balancing aids. TC tickets can be automatically inscribed on the 3895 with a customer account number and identified with both MICR and serial number printing to facilitate further handling and processing on reader sorters.

Speed: A tape feeds in increments (copy cycles) of about 203.2mm (8")

A tape longer than 203.2mm requires additional tape feed and copy cycles. After the first copy cycle which takes 8 seconds, consecutively inserted short tapes or sections of the same tape are copied in 2.4 seconds.

Stacker: At the end of the cycle, a TC ticket is fed into a reversing stacker which stacks the tickets in the correct order for processing in the 3895. Tapes will be ejected into an open container that can be emptied as required.

Operator Controls: Controls are provided among which is a variable control to accommodate varying tape paper reflectances.

Paper Supply: A paper supply drawer holds a 95.116mm (3.666") wide roll of paper supplying paper for the TC tickets. Paper is available from IRD.

Toner: A special cartridge supplying the toner for the 3896 is available.

Manuals:
- Installation Manual/Physical Planning - GA24-3643.

Supplies:
copy paper and toner cartridges

Power Requirements: Refer to Physical Planning Manual.

Special Feature Prices:

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<td></td>
<td></td>
</tr>
</tbody>
</table>

* Pilot Test Plan applies: PTP Option Percent, 65%
Purpose: Provides the power, control, logic and memory circuitry necessary for the arithmetic, logic and processor storage functions of the 4331 Processor models.

Processor Storage Models in bytes (see note below)

<p>| | |</p>
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<thead>
<tr>
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<td>I</td>
<td>524,288</td>
</tr>
<tr>
<td>J</td>
<td>1,048,576</td>
</tr>
</tbody>
</table>

Highlights: Depending on the model, can contain up to 1,048,576 bytes of nonvolatile processor storage ... storage is high density single bit cell design ... data flow is four bytes parallel ... processor storage fetch cycle is 900 nanoseconds for four bytes ... store cycle is 1300 nanoseconds for four bytes ... processor is microcode controlled.

NOTE: The microcode which controls system operations resides in both processor non-volatile and reloadable control storage reduc­ing the processor storage available for user programming. Pro­cessor storage available for the user is reduced from that installed by at least 16,384 bytes (when the optional feature, Control Storage Expansion, is installed) or by at least 53,248 bytes (when the optional feature, Control Storage Expansion, is not installed). Table 1 below lists the storage requirements for sys­tem microcode.

Standard Functions are:
- 524,288 bytes or 1,048,576 bytes of processor storage. 
(4331 Processor configurations require a portion of processor storage to be allocated for system microcode use. See Table 1 below for details.)
- ECPS: VSE mode or System/370 mode. In System/370 mode, both Extended Control (EC) and Basic Control (BC) are available. The 4331 Processor operates in either System/370 mode or in Extended Control Program Support: VSE mode. The system mode is selectable at initial Program Load (IPL) time and determines the base operating characteristics of the machine. System/370 mode allows operation of certain re­leases of OS/VS1, VM/370, DOS/VSE, DOS/VS, and DOS. 
(See Programming Note below for details.) ECPS: VSE mode supports operation of an appropriately generated DOS/VSE/VS, offering enhanced systems performance.
- Display/Printer Adapter allows attachment of:
  - 3278 Display Console mdl 2A, keyboard and control panel.
  - 3289 Line Printer mld 4.
  - 3278 model 2 display stations and keyboards.
  - 3287 Printers mld 1 and 2.
- The System Diskette Facility is the microcode loading system for the 4331 Processor. The diskette facility reads and writes format removable magnetic diskettes that provide all of the microcode for the 4331 Processor. The diskettes shipped with the 4331 Processor will supply the required microcode for diagnostics, standard functions, and the special features or­dered. The System Diskette Facility also allows storage of failure data from 4331 Processor errors which can subse­quently be analyzed by the IBM Customer Engineer for mainte­nance purposes.
- Each 4331 Processor includes 65,536 bytes of reloadable control storage provided in addition to processor storage. (An additional 65,536 bytes is available as a special feature.) This provides storage space for a portion of system microcode in support of standard functions and special features of the 4331 Processor. The reloadable control storage is not available to the user. Table 1 lists the reloadable control storage require­ments for system microcode.
- Remote Support Facility (RSF) is an IBM CE tool permitting the IBM Field Technical Support Center specialists to remotely monitor and/or control problem diagnosis in the 4331 Proc­essor. This includes remotely-initiated execution of diagnostic programs, remote examination of all or selected logout records from the System Diskette Facility, and, (with proper customer authorization), remote exercise of the Customer Manual Opera­tions.
- One level addressing facility for improved virtual storage con­trol by DOS/VSE (ECPS: VSE mode).
- Channels with virtual storage addressing (ECPS: VSE mode).
- S/370 Universal Instruction Set.
- CE maintenance support functions.
- Storage Protection (Store and Fetch).
- Byte Oriented Orchards.
- Clock Comparator and CPU Timer.
- Time of Day Clock.
- Interval Timer.
- Conditional Swapping.
- PSW Key Handling.
- Control Registers.
- Extended Precision Floating Point.
- Machine Check Handling.
- Program Event Recording.
- Channel Indirect Data Addressing (in System/370 mode).
- Monitoring.
- Clear I/O

Programming Note: The ECPS: VSE mode may be evoked at IPL time and supports operation of DOS/VSE.

When System/370 mode is IPL-ed, operation of DOS/VSE, VM/370 Release 6 and OS/VS1 Release 7 are supported. DOS/VS Release 34 is supported on the 4331 Processor in System/370 mode until December 31, 1979. VM/370 Release 5 with a PLC available 8/79 runs in System/370 mode and is sup­ported until December 31, 1979. NOTE: VM/370 Release 5 and DOS/VS Release 34 only support I/O machines previously sup­ported on S/370. Although not supported, DOS Release 26 will run on the 4331 Processor when in System/370 mode.

Console Function: An operator's display, keyboard and control panel is a prerequisite for use of the system by the customer ... a 3278 Display Console mdl 2A, keyboard and control panel. ... the display and keyboard function as an operator's I/O console to communicate with the operating system. ... the Operator Control Panel allows additional operator monitoring of the system. Depending on the mode of console operation, a maximum of 20 of the 25 lines on the display may be used for system communica­tion. Four are reserved for messages from the 3262 Processor hard­ware system, and one displays messages unique to the 3278 Display Console mdl 2A. The console address is selected at System installation time from the range 000-07F.

The console functions in one of two modes, "Display Mode" or the optional "Printer-Keyboard Mode." In the "Printer-Keyboard Mode", the display console uses the keyboard for input and the display and a 3287 Printer mdl 1 or 2 for output. The CRT, key­board and printer appear to the system as a 1052 Printer-Keyboard and operate compatibly with S/360 console operations or as a 3210/3215 Console Printer-Keyboard and operate compatibly with S/370 console operations.

Byte Multiplexer Channel (optional): Functionally equivalent to the byte multiplexer channel on S/360 and S/370 ... provides 8 control unit positions ... certain control units require an optional feature (Power Interface #5531, #5532) for on-off and Instantan­eous Power Off control. See Special Features and Table 3 below for details. The channel permits simultaneous operations of many low speed devices ... operates at 10K bytes per second in single byte mode ... up to 500K bytes per second in burst mode. See IBM 4331 Channel Characteristics, GA33-1527, for details. The Byte Multiplexer Channel is always addressed as channel 0.

Block Multiplexer Channel (optional): Provides 8 control unit positions ... certain control units require an optional feature (Power Interface #5531, #5532) for on-off and Instantaneous Power Off control. See Special Features and Table 3 below for details. Data rates is 5 million bytes per second (see IBM 4331 Channel Char­acteristics, GA33-1527, for details). The Block Multiplexer Chan­nel permits simultaneous operation of high speed devices ... ability to "Block Multiplex" and facility for multiple requesting allows several I/O units to operate concurrently with greater channel efficiency. Devices attached to these channels which cannot utilize block multiplexing will function as a single selector channels ... 33xx devices (and the 3830 Storage Control Unit) do not attach ... see DASD Adapter for attachment of 3340 devices. Standard channel address is 0; a different address may be select­ed at installation time (from the range of 0 to 255).

Native I/O Adapters: The following I/O adapters control the designated I/O devices. Because there is a close relationship between the adapter hardware, the attached I/O device(s) and the required microcode, certain I/O adapters must be installed/removed with the related devices, since the system is not to be reproduced without written permission.
4331 Processor (cont'd)

Inoperative with only the adapter installed. The adapters affected are:

<table>
<thead>
<tr>
<th>Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASD Adapter</td>
</tr>
<tr>
<td>5424 Adapter</td>
</tr>
<tr>
<td>8809 Magnetic Tape Unit Adapter</td>
</tr>
</tbody>
</table>

The adapters which may be installed without their I/O devices are:

- Display/Printer Adapter Expansion
- Communications Adapter

NOTE: All data passing through the system for any I/O device interferes with the data flow for other devices, producing I/O limitations. The limitations take two forms:

1) Hardware exclusivities listed in the sales manual text.
2) I/O attachments which individually or in combination can produce frequent overruns. Considerations in this category are:

- The aggregate data rate on the Block Multiplexer Channel and the DASD Adapter.
- The number and speed of lines attached to the Communications Adapter.
- The number and class of overrunnable devices on the Byte Multiplexer Channel.
- The number and traffic on 3278-2s attached to the Display/Printer Adapter.

It is necessary to consult the IBM 4331 Channel Characteristics Manual, GA31527, to properly configure a 4331 with an I/O configuration that has not been previously analyzed.

- DASD Adapter (optional): Attaches 3370, 3310 and/or 3340 Direct Access Storage Devices without the necessity of a control unit. Optimum DASD and systems performance is achieved when 3370 Direct Access Storage and/or IBM 3310 Direct Access Storage are attached and operate in fixed block mode. As an aid to easy transition and to facilitate installation with 4341 Processors and 5360 and 5370, emulation of 231X on 3310 and direct attachment of 3340 DASD are available.

- 3340 devices attached to the DASD Adapter have logical unit/device addresses of X00 through X07, and X10 through X17.

By installation of a special feature, the DASD Adapter can read data from an IBM 3348 Data Module which was recorded on a 3340 attached to an IBM System/3. Addresses are X00 through X07 and X10 through X17.

- All 3310 devices which attach are addressable in the range of X40 through X43, X50 through X53, X60 through X63, and X70 through X73. The 3320 devices attached to the DASD Adapter are addressable in the range of X20 - X27, and X30 - X37 when other addresses or more than two strings of 3370 are required, a utility program included as a part of CE Manual Operations is used to assign control unit addresses in the range of 0 - 7. Standard channel address is 2, but alternatives may be selected at installation time (within the range of 1 to 6) unit and device addresses are assigned at the time of installation within the ranges specified above.

- Display/Printer Adapter (standard): This adapter allows for attachment of the prerequisite 3278 Display Console mdl 2A and up to seven (or fifteen with optional feature ... see below) additional devices chosen from the list below.

<table>
<thead>
<tr>
<th>Models</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3278 Display Station mdl 2s</td>
<td></td>
</tr>
<tr>
<td>3287 Printers, mdl 1 and 2</td>
<td></td>
</tr>
<tr>
<td>3262 Line Printer, mdl 1</td>
<td></td>
</tr>
<tr>
<td>3269 Line Printer, mdl 4</td>
<td></td>
</tr>
</tbody>
</table>

These machines may be installed in any combination, provided that (1) only one (or fifteen with optional feature) devices are installed and (2) no more than two system printers (3262 mdl 1 and/or 3289 mdl 4) are installed.

- The 3262 mdl 1 or the 3289 mdl 4 line printers may be used as system printers for DOS/VSE and VM/370. The 3262 mdl 1 will be supported on the 4331 Processor by the most recently announced release of VM/BSE which is available at the FCS of the 3262. One 3287 Printer may be used as a console hardcopy device; one or more 3287 Printers may be used as hardcopy workstation devices ... 3278 Display Station mdl 2s may be used as additional operator's consoles (with the presence of OS/VS1 Multiple Console Support or equivalent) or as workstations for user-written applications. Display/Printer Adapter support includes all I/O functions of the 3278 mdl 1B with the presence of 3278 mdl 2 attached except for Cursor Select, Device Cancel Key, Print Key, Print Ident Key, Keyboard Numeric Lock, and Click Key. In addition, the following 3278 mdl 2 special features are supported: Audible Alarm, Security Keylock, and Switched Control Unit.

When used as workstations, 3278 Display Station keyboard feature codes #4621, #4622, #4623, and #4624 may be selected ... if two different keyboards are required for workstation applications, one must be #4621. Addresses for these devices are selected at installation time from the range 008 through 01F.

- Display/Printer Adapter Expansion (optional): Expands the capability of the standard Display/Printer Adapter to permit the 3278 Display Console mld 2A and up to 15 displays and/or print units to be directly attached to the 4331 Processor. All other capabilities and limitations are listed under Display/Printer Adapter (standard) above.

- Diskette Drive (optional): A single drive diskette reader/recorder providing the ability to read or write IBM Diskettes Type I on the 4331 Processor. This diskette has a data capacity of 242,944 bytes organized in 1890 sectors of 128 bytes each (for use in exchanging data with the several products listed below) or a data capacity of 246,272 bytes organized in 1924 sectors of 128 bytes each (for use in exchanging data with another 4331 Processor). Each Diskette Drive is driven by the control program as an IBM 3540 Diskette Input/Output Unit as a sequential DASD. Data recorded on an IBM Diskette Type I can be interleaved with IBM devices and systems which have a diskette drive. Examples are the IBM 3740, 3770, 3790, 5230 and 8100; and General Systems Division (GSD) Series/1, and Systems 3, 32, 34 and 38. One diskette is shipped with the feature ... additional diskettes are available.

- Device address is selected at installation time from the range 000 through 01F.

4524 Adapter (optional): Provides native attachment of 4524 Multifunction Card Unit mlds A1 or A2 for 96 column card operations. Device address is 04C.

- 8809 Magnetic Tape Unit Adapter (optional): Provides native attachment of 8809 mdl 1A and up to 6 additional 8809 tape units (consisting of a mix of 8809 mlds 2 and 3). Allows the 8809 Magnetic Tape Unit to operate in streaming mode (data rate is up to 120K bytes per second) for loading or offloading DASD devices or in start/stop mode (data rate is up to 20K bytes per second) for other data processing operations. Standard channel address is 3. Channel and device addresses may be assigned at system installation time from the range of X00 to X7F, where X is 1 to 6.

- Communications Adapter (optional): The 4331 Communications Adapter can serve up to eight communication lines. Synchronous Data Link Control (SDLC), Binary Synchronous Communications (BSC) and Start/Stop (Asynchronous) transmission modes are provided, and two of the three may be installed on one system. (Start/Stop and BSC operate in 2103 Compatibility Mode.) The Communications Adapter can handle a variety of terminals (Data Terminal Equipment, DTEs), at different speeds.

- The Communications Adapter has the following overall structure: The Communications Adapter Base contains common circuits and control. Each of the up to eight telecommunications lines attachable requires one Line Attachment Base (two different types) and one line attachment feature. Another feature serves for autocall interface and may be added. The interface with the external communication facilities is through a modem (also called signal converter or Data Circuit-terminating Equipment). It may be a stand-alone unit or a 1200 bps integrated modem. For further details refer to "Special Features."

- Attachments to Telecommunications Lines: IBM Stand Alone Modems

<table>
<thead>
<tr>
<th>Type</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switched</td>
<td></td>
</tr>
<tr>
<td>3865-2</td>
<td>1200/2400 bps</td>
</tr>
<tr>
<td>3872</td>
<td>1200/2400 bps</td>
</tr>
<tr>
<td>3864-2</td>
<td>2400/4800 bps</td>
</tr>
<tr>
<td>3874</td>
<td>2400/4800 bps</td>
</tr>
</tbody>
</table>

- Non-Switched | |
| The following modems are supported with the Switched Network Backup feature ... see 3863, 3864, 3865, 3872, 3874, 3875 for details |
| 3863-1 | 1200/2400 bps |
| 3872 | 1200/2400 bps |
| 3864-1 | 2400/4800 bps |
| 3874 | 2400/4800 bps |
| 3875 | 3600/7200 bps |
| 3865 | 4800/9600 bps |

- IBM Integrated Modem (V23, 1200 bps)

The following integrated modem configurations are available:
- Switched network with auto answer
- Non-switched line with auto answer
- Switched network with manual answer
- Non-switched line with switched network backup and auto answer

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OEM Modems: OEM modems that comply with EIA RS 232C, CCITT V24/V28, or CCITT V35 recommendations may be connected to the Communications Adapter. Attachment is under the provisions of the Multiple Supplier Systems Policy.

Digital Data Service Adapter: The Digital Data Service Adapter allows attachment to the American Telephone and Telegraph Private Line Dataphone * Digital Service Network by way of an internal Digital Data Service (DDS) Adapter.

Automatic Calling Equipment: The following Automatic Calling Equipment, maximum two, can be attached to the Communications Adapter: Byte Multiplexer Channel (#5248) provides up to 31 subchannels, 4 of which are shared subchannels supporting from 1 to 16 devices each. The maximum number of subchannels is reduced from 31 with the addition of certain special features:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Subchannels</th>
</tr>
</thead>
<tbody>
<tr>
<td>DASD Adapter (#3201)</td>
<td>2</td>
</tr>
<tr>
<td>8809 Magnetic Tape Unit Adapter (#4910)</td>
<td>2</td>
</tr>
<tr>
<td>Block Multiplexer Channel (#1421)</td>
<td>1</td>
</tr>
<tr>
<td>Communications Adapter (#1601)</td>
<td>1</td>
</tr>
<tr>
<td>Each telecommunications line on the Communications Adapter</td>
<td>1</td>
</tr>
</tbody>
</table>
| Block Multiplexer Channel: Provides up to 40 subchannels where up to 8 may be shared subchannels with 16 devices each. Allows either: 1) 32 subchannels plus 8 shared subchannels with 16 devices each, or 2) 32 subchannels plus 4 shared subchannels with 32 devices each. Prerequisites: Each system requires an operator’s display, keyboard and control panel to allow initial Microcode Load (IML) and interaction with the hardware/software system. A 3278 Display Console md1 2A with keyboard is required for this purpose. Bibliography: GCXX-XXX (to be announced) SPECIFY: 1] Voltage (single phase, 3 wire, 60Hz): #9902 for 208V, or #9914 for 240V. 2] Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunshine yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray. 3] Minimum Systems: See “Minimum Configurations” in “Systems” for minimum I/O units required for the 4331 Processor. 4] Remote Support Facilities (RSF): #9510 if the customer will use RSF. Specifying #9510 means that RSF can be used with the 4331 Processor; however its use in any maintenance situation is not required. Remote Support Facility utilization is always a customer option. When the facility is utilized, the customer must provide the telephone lines required for the Remote Support Facility module. The customer must also arrange for the connection of the telephone interface cable provided by IBM to the telephone network.

** ASCII keyboards are supported as indicated, but the internal binary codes are EBCDIC.

[5] When 3276 mdl 2s are attached to the Display/Printer Adapter or the Display/Printer Adapter Expansion (special feature) select one of three options below:

<table>
<thead>
<tr>
<th>For Any or All 3278-2 Displays and 3287 Printers</th>
<th>EBCDIC</th>
<th>ASCII**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1 (EBCDIC typewriter only) Typewriter is available for any keyboard without further specify codes</td>
<td>None Attached</td>
<td>None Attached</td>
</tr>
<tr>
<td>Option 2 (EBCDIC typewriter and data entry) Typewriter is available for any keyboard without further specify codes Specify: (1) #9442 and (2) either #9301 for Data Entry (typewriter layout) or #9302 for Data Entry (keyboard layout)</td>
<td>None Attached</td>
<td></td>
</tr>
<tr>
<td>Option 3 (EBCDIC and ASCII typewriter) Typewriter is available for any keyboard without further specify codes Specify: #9441</td>
<td>None Attached</td>
<td></td>
</tr>
</tbody>
</table>

[6] Console Table: A console table is available ... see Accessories pages for details.
[8] Shipping Instructions: Unless otherwise specified, shipping dimensions of the 4331 Processor are 62-3/4“ x 32” x 39-1/2”. If a reduction in dimensions is required, specify #9570. Shipping dimensions will then be 60” x 29-1/2” x 38-1/2”.
[9] System Environment: For record purposes specify one of the following codes (reference only, no parts required):

- #9701 – This processor is planned to be host/peer connected to a system within the same branch office territory (at installation or at a future time).
- #9702 – This processor is planned to be host/peer connected to a system in a different branch office territory (at installation or at a future time).
- #9703 – This processor is planned to be standalone (no host/peer connect).

Microcode Storage Requirements: The system microcode resides in both the reloadable control storage and the processor storage, and is loaded from the standard system diskette facility at IML time. None of the reloadable control storage is available for user programming and the systems configuration selected will determine the processor storage available for user programming and operating system residence. To calculate the amount of processor storage which is available for customer purposes and operating system residence, and to determine when Control Storage Expansion (#1901) is required, use the following procedure.

1) Consulting Table 1, determine the microcode groups required to support the features and I/O to be installed.
2) On the Table 2, place a checkmark in the appropriate rows. Note that each microcode group is required only once, even if it supports multiple functions of the 4331 Processor. The only exception to this is microcode group 2 where 2048 bytes of processor storage are required per megabyte of virtual storage as defined in the notes.
3) Find the sum of each of the three columns for the required microcode groups.
4) The total from column A must pass three tests.
   - When the total from column A exceeds 65,536 bytes, Control Storage Expansion (#1901) is required.
   - When the total from column A exceeds 131,072 bytes, an invalid configuration has been selected.
   - When the total from column A plus the total from column B exceeds 262,144 bytes, an invalid configuration has been selected.
5) Subtract the total of column A from either

" ASCII keyboards are supported as indicated, but the internal binary codes are EBCDIC.

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4331 Processor (cont'd)
- 131,072 if #1901 is required, or
- 65,536 if #1901 is not required.

6) Subtract the results of step 5 from the total of column B.

7) Add the results of step 6 to the total from column C and round up to
the next multiple of 4096.

The results of step 7 determine the amount of processor storage occupied by microcode and should be subtracted from the processor storage size ordered to determine the amount available for the user. Note that in certain circumstances the user may wish to install Control Storage Expansion (#1901) even though step 4 does not indicate that it is required. Use of #1901 may increase the amount of Processor Storage available for user programs.

<table>
<thead>
<tr>
<th>Function/Feature Installed</th>
<th>Microcode Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>4331 Processor</td>
<td>1</td>
</tr>
<tr>
<td>Processor Storage —</td>
<td></td>
</tr>
<tr>
<td>in S/370 mode, one req’d</td>
<td></td>
</tr>
<tr>
<td>in ECPS: VSE mode, one req’d per megabyte of Virtual Storage defined for the IPL (up to 16), 2</td>
<td></td>
</tr>
<tr>
<td>- 3310 attached (#3201 and #9202)</td>
<td>3, 4, 5, 6</td>
</tr>
<tr>
<td>- 3370 attached (#3201 and #9201)</td>
<td>3, 4, 6, 7</td>
</tr>
<tr>
<td>- 8809 Magnetic Tape Unit attached (#4910)</td>
<td>3, 4, 6, 7</td>
</tr>
<tr>
<td>- 3340 Direct Attach (#7851 and #3201)</td>
<td>3, 6, 8, 15</td>
</tr>
<tr>
<td>- System/3 Data Import (#6305 and #3201)</td>
<td>3, 6, 8, 15</td>
</tr>
<tr>
<td>- 2311/2314/2319/3310 Direct Access Storage Compatibility (#7901 and #3201 with #9202)</td>
<td>3, 4, 5, 6, 9, 15</td>
</tr>
<tr>
<td>- Communications Adapter Base (#1601)</td>
<td>6, 10</td>
</tr>
<tr>
<td>- BSC lines installed (#9671-9675)</td>
<td>6, 10, 11</td>
</tr>
<tr>
<td>- S/S lines installed (#9681-9688)</td>
<td>6, 10, 12</td>
</tr>
<tr>
<td>- SDLC lines installed (#9691-9698)</td>
<td>6, 10, 13</td>
</tr>
<tr>
<td>- ECPS:VM/370 (#8701)</td>
<td>16</td>
</tr>
<tr>
<td>- 1401/1440/1460 Compatibility (#3950)</td>
<td>14</td>
</tr>
</tbody>
</table>

TABLE 1

<table>
<thead>
<tr>
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<th>Microcode Group</th>
</tr>
</thead>
<tbody>
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<td>4331 Processor</td>
<td></td>
</tr>
<tr>
<td>Processor Storage —</td>
<td></td>
</tr>
<tr>
<td>in S/370 mode, one req’d</td>
<td></td>
</tr>
<tr>
<td>in ECPS: VSE mode, one req’d per megabyte of Virtual Storage defined for the IPL (up to 16), 2</td>
<td></td>
</tr>
<tr>
<td>- 3310 attached (#3201 and #9202)</td>
<td>3, 4, 5, 6</td>
</tr>
<tr>
<td>- 3370 attached (#3201 and #9201)</td>
<td>3, 4, 6, 7</td>
</tr>
<tr>
<td>- 8809 Magnetic Tape Unit attached (#4910)</td>
<td>3, 4, 6, 7</td>
</tr>
<tr>
<td>- 3340 Direct Attach (#7851 and #3201)</td>
<td>3, 6, 8, 15</td>
</tr>
<tr>
<td>- System/3 Data Import (#6305 and #3201)</td>
<td>3, 6, 8, 15</td>
</tr>
<tr>
<td>- 2311/2314/2319/3310 Direct Access Storage Compatibility (#7901 and #3201 with #9202)</td>
<td>3, 4, 5, 6, 9, 15</td>
</tr>
<tr>
<td>- Communications Adapter Base (#1601)</td>
<td>6, 10</td>
</tr>
<tr>
<td>- BSC lines installed (#9671-9675)</td>
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<td>6, 10, 12</td>
</tr>
<tr>
<td>- SDLC lines installed (#9691-9698)</td>
<td>6, 10, 13</td>
</tr>
<tr>
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<td>16</td>
</tr>
<tr>
<td>- 1401/1440/1460 Compatibility (#3950)</td>
<td>14</td>
</tr>
</tbody>
</table>

TABLE 2

<table>
<thead>
<tr>
<th>Function/Feature Installed</th>
<th>Microcode Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>4331 Processor</td>
<td></td>
</tr>
<tr>
<td>Processor Storage —</td>
<td></td>
</tr>
<tr>
<td>in S/370 mode, one req’d</td>
<td></td>
</tr>
<tr>
<td>in ECPS: VSE mode, one req’d per megabyte of Virtual Storage defined for the IPL (up to 16), 2</td>
<td></td>
</tr>
<tr>
<td>- 3310 attached (#3201 and #9202)</td>
<td>3, 4, 5, 6</td>
</tr>
<tr>
<td>- 3370 attached (#3201 and #9201)</td>
<td>3, 4, 6, 7</td>
</tr>
<tr>
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<tr>
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</tr>
<tr>
<td>- ECPS:VM/370 (#8701)</td>
<td>16</td>
</tr>
<tr>
<td>- 1401/1440/1460 Compatibility (#3950)</td>
<td>14</td>
</tr>
</tbody>
</table>

CONTROL STORAGE EXPANSION (#1901). Increases the control storage capacity of the 4331 Processor from 65,536 to 131,072 bytes, providing additional storage area for special features and the basic functions of the 4331 Processor. See Table 1 above to determine the requirement for this feature. Note that the user may wish to install this feature even if Table 1 and the associated instructions do not indicate that it is required. Under some circumstances, use of #1901 may increase the processor storage available for user programs. Maximum: One. Field Installation: Yes.

DISPLA Y(PRINTER) ADAPTER EXPANSION (#2001). Expands the capability of the standard Display/Printer Adapter to accommodate 3278 mdl 2A and up to 15 displays and/or printers to directly attach to the 4331 Processor. The devices attachable are: Up to fifteen 3278 Display Station mdl 2s Up to fifteen 3287 Printer mdl 1s and 2s Up to two 3289 Line Printer mdl 4s. Up to two 3262 Line Printer mdl 1s.


DASD ADAPTER (#3201). Allows attachment of certain DASD devices to the 4331 Processor. Up to four strings of devices may be attached to the adapter. The attachable device types may be intermixed on the adapter. The maximum number of devices of each type of device on the DASD Adapter is: (a) up to four 3310 mdl A1 or A2s with mdl B units attached to the A2s... (b) Up to two 3340 mdl A2s with 3340 B units attached... (c) Up to four 3370 mdl A1s with mdl B1 units attached. Maximum: One. Field Installation: Yes. Limitation: 3310 and 3370 are not supported

1 System Diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $405 on purchased machines to include any number of diskette-only changes ordered on the same diskette.

2 Feature supplies diskette for System Diskette facility.
4331 Processor (cont’d)

by VS1. 3370s may not be attached (#9201) to the DASD Adapter if either of the following are installed: (1) 231 X DASD attached to the Block Multiplexer Channel (#1421), (2) any telecommunication line on the Communications Adapter which operates at a speed greater than 9600 bps (#4720, or #5850 with #9444).


EXTERNAL SIGNALS (#3989).

Provides six distinct external interrupt lines to request and identify an external interrupt response from the processor unit. Maximum: One.

Field Installation: Yes. Prerequisite: External devices must meet the interface specifications outlined in S/360 - Direct Control Feature - O ES #5097. See Table 2 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).

TABLE 1

<table>
<thead>
<tr>
<th>Control units requiring Power Interface features.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1255 Magnetic Character Reader</td>
</tr>
<tr>
<td>1287 Optical Reader</td>
</tr>
<tr>
<td>1288 Optical Reader</td>
</tr>
<tr>
<td>1419 Magnetic Character Reader</td>
</tr>
<tr>
<td>1442 Card Read Punch mdl N1</td>
</tr>
<tr>
<td>1442 Card Punch mdl N2</td>
</tr>
<tr>
<td>2314 Storage Control* mdl A1, B1</td>
</tr>
<tr>
<td>2314 Direct Access Storage Facility* mdl 1</td>
</tr>
<tr>
<td>2415 Magnetic Tape Unit and Control</td>
</tr>
<tr>
<td>2501 Card Reader mdl B1, B2</td>
</tr>
<tr>
<td>2520 Card Read Punch mdl B1, B2, B3</td>
</tr>
<tr>
<td>2701 Data Adapter Unit</td>
</tr>
<tr>
<td>2702 Transmission Control*</td>
</tr>
<tr>
<td>2703 Transmission Control*</td>
</tr>
<tr>
<td>2803 Tape Control</td>
</tr>
<tr>
<td>2821 Control Unit mdl 1, 2, 3, 5, 6</td>
</tr>
<tr>
<td>2822 Paper Tape Reader Control</td>
</tr>
<tr>
<td>2840 Display Control</td>
</tr>
<tr>
<td>2841 Storage Control</td>
</tr>
<tr>
<td>3272 Control Unit</td>
</tr>
<tr>
<td>3411 Magnetic Tape Unit and Control</td>
</tr>
<tr>
<td>3505 Card Reader</td>
</tr>
<tr>
<td>3540 Diskette Input/Output Unit</td>
</tr>
<tr>
<td>3704 Communications Controller</td>
</tr>
<tr>
<td>3705 Communications Controller</td>
</tr>
<tr>
<td>3791 Controller</td>
</tr>
<tr>
<td>3800 Printing Subsystem</td>
</tr>
<tr>
<td>3803 Tape Control</td>
</tr>
<tr>
<td>3811 Printer Control Unit</td>
</tr>
<tr>
<td>3881 Optical Mark Reader mdl 1</td>
</tr>
<tr>
<td>3886 Optical Character Reader mdl 1</td>
</tr>
<tr>
<td>3890 Document Processor</td>
</tr>
<tr>
<td>3895 Document Reader/inscriber</td>
</tr>
</tbody>
</table>

* No longer available.

PRINTER-KEYBOARD MODE (#5550*).

Allows the 4331 Processor user to run an operating system which has been generated for use either on (1) an IBM S/360 with a 1052 Printer-Keyboard as operator console, or (2) an IBM S/370 with a 3210/3215 Console Printer-Keyboard used in conjunction with the standard system keyboard, display and 3287 Printer. Maximum: One. Field Installation: Yes. Prerequisite: 3287 Printer.

SYSTEM/3 DATA IMPORT (#6305*).

A feature which allows attachment of IBM 3340-A2s for the purpose of reading data from a 3348 Data Module which had been written by an IBM System/3 model 12 or 15. Up to two 3340 model B units may attach up to three 3340 model C units to each 3340-A2. The 3348 Data Module is read on a model A or B drive in a 3340 string attached via the DASD Adapter (#3201). NOTE: The 3340 mdl C2 may not attach. However, 3348 Data Modules recorded on the 3340 mdl C2 can be read when the module is installed on a 4331-attached 3340 model A or B model. This feature works in conjunction with VSE/IBM System/3-3340 Data Import program ... see Programming section of sales manual for details. Maximum: One. Field Installation: Yes. Limitation: May not be installed if 231X devices attached to the Block Multiplexer Channel (#1421). The utility program supporting this feature operates only under DASD/VSE. Prerequisite: 3340-A2 DASD and Feature Code #3201. See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901). NOTE: Feature is not required as a prerequisite.

3340 DIRECT ATTACHMENT (#7851*).

A feature allowing 3340 mdl A2s to attach to the DASD Adapter (#3201) and operate with DASD/VSE, DOS/VSE, OS/VS1 or VM/370 may attach up to two 3340 model A2s. Up to three 3340 model B units may attach to each 3340 mdl A2. NOTE: Use of this feature introduces additional processor and channel demands and may have an effect on systems performance. Maximum: One. Field Installation: Yes. Limitations: (a) May not be installed if 231X devices attach to the Block Multiplexer Channel (#1421)... (b) A maximum of two strings of 3340s may attach to each (for one string of 3340s is attached to a DASD Adapter (#3201) then only one string of 3310s can perform DASD emulation (#7901). If two strings of 3340s are attached to a DASD Adapter (#3201) no 3310's can perform DASD emulation (#7901). Prerequisites: DASD Adapter (#3201) ... 3340 mdl A2. See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901). (Note that the storage requirements are greater for two strings of 3340 than for one string.)

2311/2314/2319/3310 DIRECT ACCESS STORAGE COMPATIBILITY (#7901*). A feature allowing 2311 and 2314/2319 disk data sets to be emulated for DOS, DASD/VSE and DASD/VSE operations, on up to two consecutively addressed strings of natively attached 3310 Direct Access Storage attached to the DASD Adap-
DP Machines

4331 Processor (cont'd)

Emulation is done on a 231X volume basis mapped into predefined areas of the 3310 as follows:

- up to 7 x 2311 volumes into one 3310 drive for a maximum of 231X volumes per 3310 string
- up to 2 x 2314/2319 volumes into one 3310 drive for a maximum of 8 volumes per 3310 string.

(If it is possible to emulate 231X "Mini Volumes"; and each successive 231X Mini Volume emulated on the 3310 begins on a 231X full volume boundary.)

Use of this feature allows programs written for DOS, DOS/V, or DOS/VSE and 2311/2314/2319 DASD to be executed, with only JCL modifications, using the 3310 Direct Access Storage. Operates when either System/370 mode or ECPS; VSE mode has been IPL'ed. Data sets in fixed block mode may be intermixed on the same 3310 volumes with 231X emulated data sets but may be accessed concurrently only when ECPS; VSE mode is active.

NOTE: Use of this feature introduces additional processor and channel demands and may have an effect on systems performance.

Maximum: One. Field Installation: Yes. Limitations: (a) 2311/2314/2319 emulation only operates on up to two 3310 model A2s and the 3310 model Bs attached to them ... (b) If one string of 3310s performs emulation of 231X devices using this feature, then the DASD Adapter (#3201) can only support one string of 3340s using feature #7851. If two strings of 3310s perform emulation of 231X devices using this feature, then the DASD Adapter may not support direct attachment of 3340s through feature #7851 ... (c) Does not operate with VSE/370. (d) The feature supports both 2311 and 2314/2319 emulation but either 2311 or 2314/2319 must be selected at each IPL, not both.

Prerequisite: DASD Adapter (#3201). 3310 Direct Access Storage ... see "Machines." See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).

COMMUNICATIONS ADAPTER

Provides the basic control and common circuits for the direct attachment of up to 8 synchronous (BSC), asynchronous (Start/Stop) or Synchronous Data Link Control (SDLC) communication lines in any combination, provided that only two of the three types are installed and that the aggregate data rate capability of up to 64,000 bps is not exceeded. For data rates achievable, see G3.33-1527. The maximum speed of each of the 8 lines is 9600 bps except one of the 8 line positions may be a synchronous high speed line (BSC or SDLC) up to 56,000 bps and may operate concurrently with the data rate limitations are not exceeded. The Communications Adapter operates with Start/Stop and BSC in 2703 Compatibility Mode. SDLC is supported only under DOS/VSE, or ACF/VTAME operating under VM/370 Release 6 with DOS/VSE running as a guest.

Base characters are:
- Auto Answer
- Autopoll operation
- Multipoint station functions
- EBCDIC transparent mode for BSC only
- EBCDIC and ASCII code for BSC only

The Communications Adapter attaches up to eight lines via the following optional features:
- Up to 8 line features without internal clock for attachment to external modems (Data Circuit-terminating Equipment, DCE) with clocking
- Up to 8 line features with internal clock for attachment to external modems (Data Circuit-terminating Equipment, DCE) without clocking
- Up to 1 synchronous high speed line feature.
- Up to 8 line features with integrated modems.
- Up to 8 line features with local attachements.
- Up to 8 line features with Digital Data Service Adapters.
- Autocall Unit interfaces for up to two of the installed lines.

1 System Diskette-only special feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. 3405 on purchase may include any number of diskette-only changes ordered on the same diskette.

From the Display Console keyboard the user may specify some configuration parameters for each separate telecommunications line for each individual connection:
- select stand-by
- half speed operation for synchronous lines only (for both clocked and nonclocked modems which have this capability).
- NRZI mode in SDLC mode.
- write interrupt (S/S only).
- read interrupt (S/S only).
- unit exception suppression (S/S only).
- error index byte mode (BSC only).
- ASCII code instead of EBCDIC (BSC only).

Other configuration parameters can be selected at installation time and set by the IBM Customer Engineer.
- duplex instead of half duplex connection (two way alternate data flow transmission).
- switched network facility instead of non-switched lines (for external modems).
- new sync (for BSC or SDLC in multipoint primary station function only).
- high speed operation for one line (BSC or SDLC only).
- connect Data Set to Line or Data Terminal Ready procedure.
- selection of WE202 or V.23 answer tone frequencies for 1200 bps integrated modems with automatic answering.

Customer Responsibilities: See M 2700 pages for customer responsibilities regarding communications facilities and services.

Communication Facilities: See M 2700 pages for communications facility requirements with this feature.

Terminals Supported: The Data Communications Equipment and remotely item "terminals") supported by the Communications Adapter are shown in the table below:

<table>
<thead>
<tr>
<th>SDLC TERMINALS SUPPORTED</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
</tr>
<tr>
<td>SPEED IN KBPS</td>
</tr>
<tr>
<td>1.2 / 2.4 / 4.8 / 7.2 / 20.4</td>
</tr>
<tr>
<td>0.6 / 2.4 / 1.2 / 4.8 / 2.4 / 7.2 / 3.6 / 9.6 / 56.0</td>
</tr>
</tbody>
</table>

Terminals:
- 3271-11, 12 (3) X X X X X X X X X X X X
- 3274-1C X X X X X X X X X X X X
- 3275-12 (3) X X X X X X X X X X X X
- 3276-11-14 X X X X X X X X X X X X
- 3601 X X X X X X X X X X X X
- 3602 X X X X X X X X X X X X
- 3614 X X X X X X X X X X X X
- 3624 X X X X X X X X X X X X
- 3631 X X X X X X X X X X X X
- 3632 X X X X X X X X X X X X
- 3651-25, 75 X X X X X X X X X X X X
- 3651-450/850 X X X X X X X X X X X X
- 3651-460/860 X X X X X X X X X X X X
- 3661 X X X X X X X X X X X X
- 3664-1, 2 X X X X X X X X X X X X
- 3767-1-3 X X X X X X X X X X X X
- 3771-1-3 X X X X X X X X X X X X
- 3774-1-2,1,2,P2 X X X X X X X X X X X X
- 3775-1,F1 X X X X X X X X X X X X
- 3776-1,2 X X X X X X X X X X X X
- 3776-3,4 X X X X X X X X X X X X
- 3777-1,2,3 X X X X X X X X X X X X
- 3791 X X X X X X X X X X X X

Controllers:
- 3705 (1) X X X X X X X X X X X

Systems:
- 4331 (2) X X X X X X X X X X X
- 5320 (5) X X X X X X X X X X X
- 5340 (5) X X X X X X X X X X X
- 5380 (5) X X X X X X X X X X X
- 8100 X X X X X X X X X X X

Notes:
1) 3705 supported as a primary station in a network using ACF/VTAM Release 1 or ACF/VTAM Release 2.
2) Participant as a primary or a secondary station in a network using ACF/VTAM Release 1 or ACF/VTAM Release 2.
3) Not supported by ACF/VTAME.
4) Supported as a 3770.
**4331 Processor (cont d)**

**BSC TERMINALS SUPPORTED**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SPEED IN KBPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.2/</td>
<td>2.4/ 4.8/ 7.2/ 20.4/</td>
</tr>
<tr>
<td>0.6</td>
<td>2.4</td>
</tr>
</tbody>
</table>

### Terminals:
- 3271-1, 2
- 3274-1C
- 3275-2
- 3276-1-4
- 3631 (7)
- 3632 (7)
- 3631-24, 75
- 3651-A60_B60
- 3681
- 3684-1, 2
- 3735
- 3741-2, 4
- 3747
- 3771 (2)
- 3774, 3775 (2)
- 3776-1, 2 (3)
- 3777-1, 2 (3)
- 3780
- 5250-2 (6)

### Controllers:
- 2701(w360/370)
- 3704
- 3705

### Systems:
- 3115
- 3125
- 3135
- 3143
- 4331
- 5010 (8)
- 5320 (8)
- 5340 (8)
- 5404
- 5406
- 5410
- 5412
- 5415
- 8100 (4)
- Series 1 (8)

### Notes:
1. By Eq. 2770/2772.
2. Equivalent to 3770/3780.
3. Supported as a remote 3276.
4. With Communications Adapter.
5. 2770/3780.
6. 19,200 - 56,000 bps in line position 1.
7. See 3631 and/or 3632 in Machines for 3631/3632 features required and software requirements for host connection.
8. Equivalent to 54XX (System/3) under RPS V3/V4.
9. Equivalent to 3741-2, 4.

### START/STOP TERMINALS SUPPORTED

Only terminals using IBM Terminal Control - Type 1 are supported.

**TYPE**

<table>
<thead>
<tr>
<th>IBM Line Control Speed in BPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
</tr>
</tbody>
</table>

**Notes:**
1. Equivalent to 2740 and/or 2741. 134.5 bps speed needs 3767 RPO.

**AUTOCALL UNIT INTERFACE (#1020)**

Provides an interface to customer-supplied Automatic Calling Equipment allowing data links with remote stations to be automatically established on the switched telephone network. Automatic Calling Equipment complying with EIA RS 366 or CCITT V25 procedures may be attached. For the appropriate Automatic Calling Equipment, refer to M 2700 pages. Maximum: Two. Field Installation: Yes. Limitations: Does not operate with High Speed Modem Adapter (#4720), any features with 1200 bps Integrated Modem or with any non-switched lines. Specify: Line position ... see Table 4 below. Prerequisites: Communications Adapter, Base (#1601) or EIA/CCITT Interface (#3701) (in switched operation) for each Autocall Unit Interface installed. Field Installation: Yes. Limitations: Requires, for attachment to external equipment.

**COMMUNICATIONS ADAPTER, BASE (#1601)**

Allows attachment of up to eight lines (with up to two transmission modes) plus Autocall Unit Interfaces (#1020) for up to two of the lines. The aggregate data rate capability of the Communications Adapter is 64,000 bps. Maximum: One. Field Installation: Yes. Limitations: Line features for only two transmission mode versions may be installed (SDLC and BSC, SDLC and S/S, or S/S and BSC) ... see Table 4 below. SDLC is supported only by ACF/VTAME operating under DOS/VSE, or ACF/VTAME operating under VM/370 Release 6 with DOS/VSE running as a guest. The aggregate data rate capability of the Communications Adapter is 64,000 bps; line features which exceed this aggregate data rate may be installed but not operated concurrently. For data rates achievable see IBM 4331 Channel Characteristics, GA33-1527. When 231X DASD is attached to the Block Multiplexer Channel (#1421) no line feature may be attached which runs at a speed greater than 9600 bps. See features below for details. Each line attached operates with one subchannel of the Byte Multiplexer Channel (#5248). See "System Subchannels" above for details. Specify: See Table 4, "Communications Adapter Configuration Features and Position Codes," for required specify codes for each line feature attached. Prerequisites: Adapter Power Prerequisite (#1001) is required when more than three telecommunications line features are attached. See Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).

**EIA/CCITT INTERFACE (#3701)**

This feature may be intermixed with other line features. Each feature provides for the attachment of one external modem having EIA RS 232-C, CCITT V24/V28 interface for attachment to one switched or one non-switched line. When this feature is installed in conjunction with Line Attachment Base for Clocked Modem (#4695), a BSC or SDLC line is supported. Non-switched lines with switched network backup may be used where maximum line speed on non-switched lines is 9600 bps, the maximum line speed on switched network backup or switched networks is 4800 bps. When this feature is installed in conjunction with Line Attachment Base for Nonclocked Modems (#4696), then a BSC, Start/Stop, or SDLC line is supported. Transmission speeds supported are listed with feature #4696 below. Maximum: Eight. Field Installation: Yes. Specify: Start/Stop, SDLC and/or BSC operations are possible ... see Table 4 for Line Position Code and Transmission Mode Codes. Prerequisites: Communications Adapter, Base (#1601). One Line Attachment Base for Clocked Modem (#4695) or Line Attachment Base for Nonclocked Modems (#4696) is required for each feature (#3701) installed. Field Installation: Required, for attachment to external equipment.

**LINE ATTACHMENT BASE FOR CLOCKED MODEMS (#4695)**

This feature is a prerequisite for all line adapters which attach to modems (Data Circuit-terminating Equipment) providing clocking. See the various line features below to determine when it is required. Maximum: Eight, one per line installed. Field Installation: Yes Limitations: A maximum of eight Line Attachment Bases may be installed on each 4331 Communications Adapter. Each feature (#4695) installed reduces by one the number of features (#4696) allowable. Prerequisite: Communications Adapter, Base (#1601).

**LINE ATTACHMENT BASE FOR NONCLOCKED MODEMS (#4696)**

This feature is a prerequisite for all line adapters which attach to modems (Data Circuit-terminating Equipment) which do not provide clocking. See the various features below to determine when it is required. The clock speed internal to the feature is wired by default to 134.5 bps for Start/Stop operation and 1200 bps for BSC and SDLC operation. Otherwise, the clock speed can be wired at installation to one of the following:
- Start/Stop 75, 300, 600 or 1200 bps
- BSC 600
- SDLC 600

For BSC or SDLC operations, if 1200 bps is wired, then full speed operation (1200 bps) or half-speed operation (600 bps) may be selected from the operator console keyboard. Maximum: Eight, one per line installed. Field Installation: Yes A maximum of eight Line Attachment Bases may be installed on each 4331 Communications Adapter. Each feature (#4696) installed reduces by one the number of features (#4695) allowable. Prerequisite: Communications Adapter, Base (#1601).

**HIGH SPEED MODEM ADAPTER (#4720)**

The feature provides for the attachment of an external modem with clock having a CCITT V25 interface. One Line Attachment Base for Nonclocked Modem Adapter (#4720) and/or SDLC line may be operated with speeds of 20,400, 40,800, 81,900 and 163,800 bps.
4331 Processor (cont'd)

Limitations: Operation is with up to 7 other 
Channel 
average data rate 
231 X
Transmission Mode Codes. Prerequisite: Communications 
Start/Stop or 
SDLC line 
Switched network 
Transmission speed can be 

1200 BPS INTEGRATED MODEM, NON-SWITCHED (#4781)*. This feature may be intermixed with other line features. Each feature provides for the attachment of one non-switched BSC, 
Start/Stop or SDLC line via an integrated 1200 bps modem. The transmission speed can be straped by the customer engineer for 
Start/Stop operation up to 1200 bps and for BSC or SDLC opera-
tion at 600 or 1200 bps. Selection of two or four wire operation is 
made at installation time. Maximum: Eight. Field 
Installation: Yes. Specify: SDLC and/or BSC and/or Start/Stop operations are possible 
... see Table 4 for Line Position Code and Transmission Mode Codes. Prerequisite: Communications Adapter, Base (#1601), and Line Attachment Base for Nonlocked Modems (#4696). Cable Order: Required for attachment to external equip-
ment.

1200-2400 BPS INTEGRATED MODEM, SWITCHED WITH AUTO ANSWER (#4787)*. This feature may be intermixed with other line features. Each feature provides for the attachment of one switched network Start/Stop line via an integrated modem at speeds up to 2400 bps and for BSC or SDLC operation at 1200 bps. Attachment to the switched network is via an IBM provided cable to a Data Access Arrangement type CBS or FCC registered equivalent. Maximum: Eight. Field 
Installation: Yes. Specify: DDS and/or BSC and/or Start/Stop operations are possible 
... see Table 4 for Line Position Code and Transmission Mode Codes. Prerequisite: Communications Adapter, Base (#1601), and Line Attachment Base for Nonlocked Modems (#4696). Cable Order: Required for attachment to external equip-
ment.

LOCAL ATTACHMENT INTERFACE (#4801)* Provides circuits and controls for the local attachment of one BSC or SDLC remote station to the Communications Adapter without the use of modems

---

1 System Diskette-only specify feature. No fee when ordered at time of manufacture or with chargeable feature that supplies diskette. $405 on purchased machines to include any number of diskette-only changes ordered on the same diskette.

2 Feature supplies diskette for System Diskette facility.

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### TABLE 4

<table>
<thead>
<tr>
<th>Feature #</th>
<th>Req’d Line Attach Base #</th>
<th>Line Position with Line Position Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1’ 2’ 3’ 4’ 5’ 6’ 7’ 8’</td>
</tr>
<tr>
<td>EIA/CCITT Interface (for Clocked Modem) (6)</td>
<td>3701 4695 9331 9332 9333 9334 9335 9336 9337</td>
<td>9338</td>
</tr>
<tr>
<td>EIA/CCITT Interface (for non-clocked Modem) (6)</td>
<td>3701 4696 9521 9522 9523 9524 9525 9526 9527</td>
<td>9528</td>
</tr>
<tr>
<td>High Speed Modem Adapter (7)</td>
<td>4720 4695 9501</td>
<td></td>
</tr>
<tr>
<td>1200 bps Integrated Modem:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nonswitched with Switched Network Backup and Auto Ans</td>
<td>4788 4696 9641 9642 9643 9644 9645 9646 9647</td>
<td>9648</td>
</tr>
<tr>
<td>Nonswitched with Switched Network Backup and Manual Ans</td>
<td>4787 4696 9631 9632 9633 9634 9635 9636 9637</td>
<td>9638</td>
</tr>
<tr>
<td>Switched with Auto Ans</td>
<td>4782 4696 9651 9652 9653 9654 9655 9656 9657</td>
<td>9658</td>
</tr>
<tr>
<td>Nonswitched</td>
<td>4781 4696 9661 9662 9663 9664 9665 9666 9667</td>
<td>9668</td>
</tr>
<tr>
<td>Digital Data Service Adptr - for 2400, 4800, 9600 bps for 56,000 bps CUB</td>
<td>5650 4695</td>
<td></td>
</tr>
<tr>
<td>Local Attach Interface</td>
<td>9471 9472 9473 9474 9475 9476 9477 9478</td>
<td></td>
</tr>
<tr>
<td>Auto Dial Unit Adptr (2)</td>
<td>4801 4695 9451 9452 9453 9454 9455 9456 9457</td>
<td>9458</td>
</tr>
<tr>
<td>First</td>
<td>9541 9542 9543 9544 9545 9546 9547 9548</td>
<td></td>
</tr>
<tr>
<td>Second</td>
<td>9551 9552 9553 9554 9555 9556 9557 9558</td>
<td></td>
</tr>
<tr>
<td>Transmission Mode (3)</td>
<td>9671 9672 9673 9674 9675 9676 9677 9678</td>
<td></td>
</tr>
<tr>
<td>BSC (1)</td>
<td>9681 9682 9683 9684 9685 9686 9687 9688</td>
<td></td>
</tr>
<tr>
<td>Start/Stop</td>
<td>9691 9692 9693 9694 9695 9696 9697 9698</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**

1. **BSC or SDLC transmission mode with any line attachment feature.**
2. **Start/Stop transmission mode only with EIA/CCITT Interface (for nonclocked modem. #3701 and prerequisite #4696) or with any other features offering 1200 bps Integrated Modem (with prerequisite #4696).**
3. **Must be associated with EIA/CCITT Interface (#3701 and prerequisite #4695 or #4696). Maximum of two features (#1020) may be installed.**
4. **Only two Transmission Modes may be installed on a system. The aggregate data rate of the Communications Adapter is 64,000 bps. Line features exceeding this aggregate may be installed, but not operated concurrently. To allow the aggregate of 64,000 bps to be achieved, the highest speed line must be installed in line position one, the next highest in line position two, etc. Each transmission mode installed has different requirements for microcode storage ... see Table 1 for microcode storage requirements and possible requirement for Control Storage Expansion (#1901).**
5. **May not be installed when 251X DASD is attached to the Block Multiplexer Channel (#1421), or when 3370 DASD is attached (#3201).**
6. **When changing #944 to/from #9471, no new hardware or diskette is required.**

---

**Special Feature Prices: MLC 2 yr Purch MMC/ AMMCR**

- **Adapter Power Prereq #1001 $71 $60 $2,400 $7.00**
- **Adapter Logic Prereq #1002 129 110 4,400 12.00**
- **Block Multiplexer Channel #1421 129 110 4,400 1.50**
- **Control Store Expansion #1901 150 128 5,100 34.00**
- **Display/Printer Adapter Expansion #2001 32 27 1,215 1.50**
- **DASD Adapter #3201 106 90 3,600 3.50**
- **Diskette Drive 3401 103 88 3,520 18.50**
- **External Signals 3693 9 300 .50**
- **5424 Adapter #3901 194 165 6,800 8.50**
- **1401/1440/1460 Compat #3950 N/C N/C N/C N/C**
- **8000 Mag Tape Unit Addpr #4910 106 90 3,600 3.50**
- **Byte Multiplexer Channel #5248 103 88 3,520 1.50**
- **Power Interface 5531 65 55 2,200 1.00**
- **Power Interface, Add’l #5532 33 28 1,100 1.00**
- **Printer-Keyboard Mode #5550 N/C N/C N/C N/C**
- **System 3 Data Import #6305 N/C N/C N/C N/C**
- **3340 Direct Attachment #7851 N/C N/C N/C N/C**
- **2311/2314/2319/3310 Direct Access Storage Comp #7901 N/C N/C N/C N/C**
- **ECPS:VM/370 #8701 N/C N/C N/C N/C**

**Communications**

- **AutoCall Unit Interface #1020 13 11 440 .50**
- **Comm Adapter, Base #1901 90 77 3,080 1.50**
- **EIA/CCITT Interface #3701 101 11 440 .50**
- **Line Attach Base for Clocked Modems #4695 13 11 440 .50**
- **for Nonclocked Modem #4696 14 13 520 .50**
- **HI Speed Modem Adapter #4720 35 30 1,320 2.00**
- **1200 bps Integrated Mode (#3200) Non-Switched #4781 19 16 668 3.50**
- **Switched w Auto Ans #4782 25 21 860 3.50**
- **Non-Switch w Switch Network Backup and Manual Ans #4787 26 22 910 3.50**
- **Non-Switch w Switch Network Backup and Auto Ans #4788 29 25 1,015 4.00**
- **Local Attachment Interface #4801 29 25 1,100 3.00**
- **Dglt Data Service Adptr #5650 24 20 840 2.50**

**ACCESSORIES:** The following items are available on a purchase only basis. For shipment with the 4331, order the feature number indicated below at the price listed in the M10000 pages. See the M10000 pages for additional information and field installation.

**CONSOLE TABLE, 4300 PROCESSORS (#1550).** Provides a convenient work station table to support one or two 3278 mdl 2As. Specify: Color — #9161 for willow green, #9162 for garnet rose, #9163 for sunrise yellow, #9164 for classic blue, #9165 for charcoal brown, or #9166 for pebble gray.

**BOOK RACK AND CABLE HOLDER (#1480).**

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IBM 4341 PROCESSOR

Purpose: Provides power, control, logic, and memory circuitry for the arithmetic, logic, and processor storage functions of the 4341 Processor.

Model

<table>
<thead>
<tr>
<th>Bytes of Processor Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
</tr>
<tr>
<td>2,097,152</td>
</tr>
</tbody>
</table>

Note: The microcode which controls system operations resides in Releasable Control Storage tables in Processor Storage, thus reducing the amount of Processor Storage available for user programming. Storage available to the user is reduced by a minimum of 14K bytes up to a maximum of 108K bytes, depending on the processor configuration. See "Microcode Storage Requirements" below for details.

Highlights: Depending upon the model, has 2,097,152 bytes or 4,194,304 bytes of monolithic processor storage... 150 to 300 nanosecond processor cycle... eight byte parallel data flow within the processor as well as an eight byte wide data flow between the processor, storage and control channels... includes 8,192 bytes of buffer storage which is transparent to the program and significantly reduces the effective access time of storage... buffer storage does not increase the amount of addressable storage... balanced performance of decimal, commercial, and scientific... Indirect Interval Control Storage... Modes of Load and Storage... Include:... The 4341 Processor provides... for FE diagnostics, basic systems features, plus the optional features ordered for the system. The System Diskette File also allows recording of system failures or the last system configuration at the time the diskette was created.

Console Function: A 3278 Display Console model 2A equipped with an operator keyboard with an operator control panel is required. It is the principal device provided for the operator to communicate with the system. The operator can use the keyboard and the display to control the system operation as well as to display the status of the system. The primary operator console keypad includes the operator control panel. The 3275 Processor has a screen size of 1920 characters, 24 lines at 80 characters per line. The bottom four lines (lines 21-24) are reserved for system messages. The keypad is not a user-keypad, the 3278 features other than those basic to the primary console display/keypad are not supported. Up to three optional (for a total of four) 3272 Printer model 2A printers are available. The user,keypad output is also available in any combination.

Two console modes are available -- Display Mode and Printer-Keyboard Mode.

In Display Mode, the keyboard is used for input, the display, with 20 lines of 80 characters/line for output, and DOS/VSE, DOS/VS Release 34, OS/VS1 Release 7 or VM/370 Release 6 support is required. The optional 3287 Printer model 1 or 2 has a separate address.

In Printer-Keyboard Mode, the 3278 Display Console model 2A uses the keyboard for input and the display and a recommend­ed 3287 Printer model 1 or 2 for output. The display/keyboard and 3287 Printer appear as a Console Printer-Keyboard. This allows the 4341 Processor user to run an operating system which has been generated for use on a S/360 with a 1052 Printer-Keyboard or a S/370 with a 3210 or 3215 Console Printer-Keyboard.

Channels: Six channels in two groups are available. The standard group consists of 1 byte multiplexer channel and 2 block multi­plexers channels. The block multiplexer channels have a block transfer rate of up to 2.0 million bytes per second for each channel. The second group, available as a special feature, consists of 3 block multiplexer channels. Single channel block transfer rate of up to 2.0 million bytes per second is available on each of two of the three optional channels and 1.0 million bytes per second on the other.

The aggregate data rate of the two standard block multiplexer channels is 4 megabytes/second. The aggregate data rate of the five block multiplexer channels including the optional group is 9 megabytes/second.

The capability for the attachment and automatic I/O power sequenc­ing of up to 24 separate control units is standard. Optional­ly, 48 control units can be accommodated... see "Special Features."

An optional channel-to-channel adapter is also available... see "Special Features."

Compatibility: Any program written for S/370 will operate on the 4341 in S/370 Mode, provided that it (1) is not time-dependent, (2) does not depend on system facilities (storage size, I/O equipment, optional features, etc.) being absent when the facilities are not included in the configuration, (3) does not depend on system facilities (interceptions, operation codes, etc.) being absent when the facilities are included in the 4341, and (4) does not depend on results or function which are defined in the Principles of Operation to be unpredictable or model-dependent.

Any program written for S/360 will operate on the 4341 Processor in S/370 mode, provided that it follows the above rules and does not depend on functions that differ between S/360 and S/370.

Any program written for the 4331 Processor in ECPS:VSE Mode or S/370 Mode will operate on a 4341 Processor, provided that it follows the above rules.


Microcode Storage Requirements: The microcode which controls system operations resides in Releasable Control Storage and key dynamic tables in Processor Storage, thus reducing the amount of Processor Storage available for user programming. The amount required is the sum of Processor Storage required by two user selectable options: (1) The number of Unit Control Words (UCWs) selected, and (2) the mode of operation.

1. 128 UCWs are basic on the 4341 and require 8,192 bytes of Processor Storage. Additional UCWs are allocated as required in groups of 32, each group requiring an additional 2,048 bytes of Processor Storage. The maximum number of ucws selected is 512.

UCW assignment is user dependent. It is the customer’s responsibility to designate desired I/O addresses and configuration to service personnel. Channel configurations should be...
For specific device requirements, see 4300 Processors in "Systems."

2. Depending on which mode of operation is selected at IML time, processor storage will be required as follows:

<table>
<thead>
<tr>
<th>Bytes of Processor Storage Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of Operation</td>
</tr>
<tr>
<td>ECPS:VSE Mode</td>
</tr>
<tr>
<td>System/370 Mode</td>
</tr>
</tbody>
</table>

Prerequisite: Each 4341 Processor requires one 3278 Display Console model 2A equipped with a keyboard and an operator control panel ... see "Special Features" under 3278 model 2A.

Minimum Configuration: See Minimum Configuration under 4300 Processors in "Systems."

Bibliography: To be announced.

SPECIFY

- Voltage (AC, 3-phase, 4-wire, 60 Hz): #9903 for 208 V, or #9915 for 240 V.
- Shipping instructions: Unless otherwise specified, shipping dimensions of the 4341 are 62-3/4" x 32" x 39-1/2". If a reduction in dimensions is required, specify #9570. Shipping dimensions will then be 60" x 29-1/2" x 38-1/2".
- Cabling: See 3278 model 2A for console cabling.
- Color: #9060 for willow green, #9061 for garnet rose, #9062 for sunrise yellow, #9063 for classic blue, #9064 for charcoal brown, or #9065 for pebble gray. Note: #9061, #9062 and #9063 are slightly different colors from those available on previous machines.
- Remote Support Facility: The Remote Support Facility (RSF) is a customer option. It is recommended to enhance the hardware maintenance of the 4341 Processor. It provides service personnel the capability of remotely controlling the 4341 from any RETAIN terminal and allows the IBM CE to access the RETAIN Data Bank for the latest service aids and information from the customer site. When this option is selected, the customer must provide the telephone lines required for the RSF modem. The customer must also arrange for the connection of the telephone interface cable provided by IBM to the telephone network. For details on customer responsibilities, see 4300 Processors Installation Manual - Physical Planning, GA24-3667.
- If RSF is desired, specify #9510.
- System Environment: For record purposes specify one of the following codes (reference only, no parts required):
  - #9701 — This processor is planned to be host/peer connected to a system within the same branch office territory (at installation or at a future time).
  - #9702 — This processor is planned to be host/peer connected to a system in a different branch office territory (at installation or at a future time).
  - #9703 — This processor is planned to be a standalone (no host/peer connect).

Prices:

<table>
<thead>
<tr>
<th>Model</th>
<th>MRC</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
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<td>Mdl</td>
<td>2 Yr</td>
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<tr>
<td>K1</td>
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<td>L1</td>
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Plan Offering: Plan D
Warranty: A
Machine Group: D
Useful Life Category: 2
Per Call: 3
Purchase Options: 8
Upper Limit Percent: 5%
Termination Charge Months: 5
Termination Charge Percent: 25%
Initial Period of Maintenance Service Availability: 3 mos.

Model Changes: Field installable.

MODEL UPGRADE PURCHASE PRICE (There are no additional installation charges)

Model K1 to Model L1 ... $30,000

SPECIAL FEATURES

CHANNEL-TO-CHANNEL ADAPTER (#1850). To interconnect two channels (4341 Processor, S/360, S/370). Only one of the processors requires this feature. Requires one control unit position on each of the connected channels. Maximum: One. Field Installation: Yes. Prerequisite: 75 Key Operator Console Keyboard with Channel-to-Channel (#4831) on the primary 3278 Display Console mdl 2A ... a control unit position on a block multiplexer channel.

BLOCK MULTIPLEXER CHANNELS, ADD'L (#1870). An optional group of three block multiplexer channels ... permits simultaneous operation of high speed devices at a data rate of 2.0 MB/second for two channels and 1.0 MB/second for one channel. Maximum: One. Field Installation: Yes.

CHANNEL CONTROL UNIT POSITIONS, ADD'L (#1890). This feature is required for the automatic I/O power sequencing of more than 24 control units from the 4341. Standard on the 4341 is the capability to attach and automatically power up 24 control units, not to exceed eight per channel. With this feature, 25 to 48 control units, not to exceed 8 per channel, may be attached and automatically powered up. Maximum: One. Prerequisite: Block Multiplexer channels, Add'l (#1870). Field Installation: Yes.

ACCESSORIES: The following items are available on a purchase only basis. For shipment with the 4341, order the feature number indicated below at the price listed in M 10000 pages. See the M 10000 pages for additional information and field installation.

Book Rack and Cable Holder, 4300 Processors (#1480).

Not to be reproduced without written permission.
IBM 5010 PROCESSOR MODULE

Purpose: Provides the arithmetic, logic and control functions for System/7.

Models:

<table>
<thead>
<tr>
<th>Storage (words)</th>
<th>Stand-Alone 1130 Attach</th>
<th>Models</th>
<th>Models</th>
</tr>
</thead>
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<td>B2</td>
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<tr>
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</table>

* Requires #7401 is 5026.

Highlights: Uses binary arithmetic, fixed word length of 16 data bits plus 2 parity bits. Storage cycle time is 400 nanoseconds. Instructions are one or two words in length with one instruction address register per interrupt level, two interrupt levels with 16 sublevels. 7 index registers, one accumulator, (Norelco Model 2703633). The attachment provides the capability to IPL and program load either FE Diagnostic Programs or the Disk Support System (DSS/7) (5307-SC2) from a tape cassette recorder (Norelco Model 1420 or equivalent). See Customer Responsibilities for System/7 in the "Systems" section.

The A and E models have an Asynchronous or Binary Synchronous Communications Adapter as an optional feature. This circuitry provides the capability for initial program load of the System/7 from a remote system with no resident program in the System/7. The B models have an interface for connection to an 1130 System as a standard feature.

PREREQUISITES: The first module location in the 5026 Enclosure mdl A2, C3 or C6. A and B models with more than 8K of storage require Storage Power Addition (#7401) in the 5026 Enclosure.... see 5026. #7401 is not required for E models. For E models replacing installed A or B models, or vice versa, an MES (lease) or RPQ (purchase) must be ordered for the proper 5026 Power Specification ... see 5026. The B models require a Storage Access Channel (#7490) on the 1131 or a Storage Access Channel II (#7492) on an 1133. Limitation: Program preparation on configurations with 2K storage are not supported by IBM supplied programming.

Customer Responsibilities: See System/7 in "Systems" section.

System/7 Summary: GA34-0002

Specify: [1] For the location of the Modules in the system, specify one of the following:

- #9141 — location of all I/O Modules to be determined at the plant. (Specify Code #9143 in I/O Modules cannot be used.)
- #9142 — location of all I/O Modules are specified by the customer. Specify Code #9143 must be used in each I/O Module order.
- #9144 — for shipment without mounting in an enclosure.

[2] System Control Programs must be ordered prior to Order Confirmation (OC) Time.

Cables: Use cable order form number 1210-2368.


---

**Prices:**

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</table>

Plan Offering: Plan B Warranty: A Maintenance: A Purchase Option: 60% Useful Life Category: 2 Per Call: 2

Model Changes: Changes within A mdls. B mdls or E mdls are field installable. REPLACEMENTS of A mdls with E mdls requires a 5026 to remove code #7401 or #9490 on both and add code #9491 (see 5026). CHANGE from A or B mdls to E mdl (and vice versa) within a 5010 cannot be field installed. Changes from A mdl to B mdl (and vice versa) are not recommended for field installation.

**Storage Upgrade Purchase Prices:** Upgrade price equals the difference in purchase price between the two models. There are no additional installation charges.

**Special Features**

**Cycle Steal Basic** (#2662). Provides a path between 5010 main storage for the 5022 Disk Storage Module, equipped with companion cycle steal attachment, Disk Cycle Steal (#2664). Maximum: One per 5010. Field Installation: Yes. Prerequisite: Model A4 or larger, Model B4 or larger, or Model E16 or larger. Required for 5996-T01, 3430 Attachment.

**5024 Attachment Feature** (#4115). [Mdl E only] Provides a path between 5010 mdl E main storage for the 5024 I/O Attachment to Enclosure. Maximum: One per 5010 mdl E. Field Installation: Yes. Limitation: Cannot be installed with IBM 1200 bps Integrated Modem. Requires #5500 or #5550 in 360/370 Channel Attach (RPQ 1610). Other 5010 mdl E RPQs must be submitted for review.

**Asynchronous Communications Control** (#1610). [Mdl S and E only] Provides control circuits for one synchronous communications line adapter. #1610 is used for communications with S/360 and S/370 (via 2701, 2702, 2703, 3704 or 3705), or for communications with 4300 Processors (via a 2701, 3704, 3705 to all 4300 Processors, or via the Communications Adapter feature on the 4331) ... see 2701, 3704/3705, 4331 and 4341 in "Machines" for details and prerequisites. See 2704 and 3705 Machines and Programming sales manual pages for attachment capability and refer to Host System Programming pages for possible restrictions to any of the above attachments. 370/370 mdl 115, 125, 135, 135-3 and 138 with Integrated Communications Adapter (#4640), and with the 1800 System (via RPQ CO8763). Data transmission is serial by bit using a specified method of character and bit synchronization. The IBM PTT/ECBCD code is used. Point-to-point or multipoint transmission at speeds of 134.5 or 600 bps (14.8 or 68.7 characters per second) are available. Speed changes can be made in the field. Line control characters are identical to 2740 mdl 1. Line control characters are used in a manner similar to 2740 mdl 1, with error checking. See IBM System/7 Functional Characteristics, GA34-0003, for exact description of use. Communication Control provides the capability to load a program from the communications network into a 5010 with no resident program in System/7 (remote IPL). For information on communications facilities, see M 2700 pages. Maximum: One #1610 per system. Limitation: Cannot be installed with Binary Synchronous Communications Adapter (#2074). Field Installation: Yes.

**Common Carrier Adapter** (#2165). [Mdl S and E only]

Not to be reproduced without written permission.
Provides interface to an external modem meeting EIA standard RS-232-C. The interface lines provided are Transmit Data, Received Data, Request to Send, Clear to Send, Data Set Ready, Data Terminal Ready, and Carrier Detect. Limitation: Cannot be used with Line Adapter (#4750, 4751 or 4752). Maximum: One per #1610. Field Installation: Yes. Prerequisite: Asynchronous Communications Control (#1610).

LINE ADAPTER, LEASED LINE TYPE 1A (#4751). [Mdls A and E only] A leased line type 1A modem for 2-wire unlimited distance use at speeds of 134.5 or 600 bps. Only point-to-point communications facilities can be used. See Line Adapter Leased Line Type 1A in SRL GA24-3435 for specifications and requirements. Limitation: Cannot be used with Line Adapters (#4750 or #4752) or Common Carrier Adapter (#2165). Maximum: One per #1610. Field Installation: Yes. Prerequisite: Asynchronous Communications Control (#1610).

LINE ADAPTER, LIMITED DISTANCE TYPE 2B (#4750). [Mdls A and E only] A limited distance type 2B modem for 2-wire use up to 8.2192 bps on 134.5 or 600 bps, or multipoint communications facilities can be used. See Line Adapter Limited Distance Type 2B in SRL GA24-3435 for specifications and requirements. Limitation: Cannot be used with Line Adapters (#4750 or #4752) or Common Carrier Adapter (#2165). Maximum: One per #1610. Field Installation: Yes. Prerequisite: Asynchronous Communications Control (#1610).

† BINARY SYNCHRONOUS COMMUNICATIONS CONTROL (BSCCA) (#2074). [Mdls A and E only] Provides circuitry for one binary synchronous communications adapter. This feature is used for communications with S/370, a Communications Adapter on a 4331 Processor, another System/7 with BSCCA (#2704), a System/3 mdd 6, 8, 10, 12 or 15 with BSCCA, a System/32 with BSCCA (#2074) (switched or non-switched point-to-point only), a System/34 with Communications Adapter (switched or non-switched point-to-point only), a System/3 mdd 6, 8, 10, 12 or 15 with Communications Adapter and ICA-Local Attachment (#4645, #4703), or a System/3 mdd 8 or 12 with Integrated Communications Adapter (ICA) (#4645) or ICA-Local Interface, or a System/3 mdd 6 with ICA or BSCCA data transmission. In half duplex over 2- or 4-wire circuits using binary synchronous line control. Data transfer on point-to-point (switched or non-switched) and multipoint configurations is supported. In multipoint configurations, System/7 operates as a tributary station. On point-to-point networks System/7 functions as a processor terminal. Transmission codes supported are EBCDIC and ASCII. Control information is standard in the BSCCA, but allowed only in EBCDIC. Control circuitry provides the capability for IPL of the System/7 from a remote system. IPL can be used only on point-to-point switched and multipoint configurations and requires the use of transparent EBCDIC transmission code.

Local Attachment to System/3 -- Point-to-point Non-Switched Communications is also provided with the System/3 BSCCA-EIA-LOCAL, LCA, or ICA-LOCAL.

SYSTEM/3 LCA (#4765), BSCCA-EIA-LOCAL (#3601, 3602), ICA (#4645) Model Speed (bps) BSCCA-EIA-LOCAL Speed (bps) ICA Speed (bps) 6 2400 N/A N/A 2400, 4800, 8000 8 2400, 4800, 8000 2400, 4800, 8000 10 2400, 4800, 8000 2400, 4800, 8000 12 2400, 4800, 8000 N/A N/A 15 2400 2400, 4800, 8000 N/A N/A For local attachment to a System/3 BSCCA-EIA-LOCAL, ICA-LOCAL, or LCA, an appropriate cable order is required. Installation Manual - Physical Planning, GA34-0004, includes cable description and ordering information. Limitations: Cannot be installed with Asynchronous Communications Control (#1610); support as a multipurpose communications control is not provided. Maximum: One #2074 per system. Field Installation: Yes. Prerequisite: 5010 mdl A6 or larger or mdl E16 or larger.

INTERNAL CLOCK (#4703). [Mdls A and E only] Provides BSCCA clocking when modems do not provide clock pulses. Options are 1200, 2400 and 2400 bps which are hardware selectable. Maximum: One per #2074. Limitation: Not available with Line Interface Type 1G (#4805). Do not use if System/7 is to interface to a System/3 mdd 8, 10, 12 or 15 BSCCA-EIA-LOCAL Attachment (#3601, 3602) or a System/3 mdd 6, 10 or 15 Local Communications Adapter (LCA) (#4765), or a System/3 mdd 8 or 12 Integrated Communications Adapter (ICA) (#4645). Field Installation: Yes. Prerequisite: BSCCA (#2074).

LINE INTERFACE TYPE 1D (#4800). [Mdls A and E only] Provides low and medium speed interface permit operation with external modems that comply with the EIA RS-232-C standard and with System/3 mdd 3, 8, 10, 12, 15 with BSCCA and ICA Attachment (#3601, 3602), or a System/3 mdd 6, 10 or 15 with Local Communications Adapter (LCA) (#4765), or System/3 mdd 8 or 12 with Integrated Communications Adapter (ICA) (#4645). Modems of this type operate on switched or non-switched facilities up to 2400 bps and over non-switched facilities at up to 7200 bps. Auto-answer capability is supported. Maximum: One per #2074. Limitations: Cannot be installed with Line Interface Type 1G (#4805) or IBM 1200 BPS Integrated Modem (#5500, 5501). Field Installation: Yes. Prerequisite: BSCCA (#2074).

LINE INTERFACE TYPE 1G (#4805). [Mdls A and E operating up to 50.0K bps max.] Provides a high speed interface for standard or non-switched modems operating on a wide band interface. Modems of this type operate at speeds of 10,000 bps and higher only on non-switched lines. Maximum: One per #2074. Limitations: Cannot be installed with #4800, #5500, #5501; Internal Clock (#4703) is not available with this feature; Will not interface to S/370 mdd 135, 135-3 or 138 Integrated Communications Adapter (#4640), or Communications Adapter feature on a 4331. Field Installation: Yes. Prerequisite: BSCCA (#2074).

IBM 1200 BPS INTEGRATED Modem, LEASED (#5500). [Mdls A and E only] Provides one IBM 1200 bps Integrated Modem which is suitable for communications over facility D3 with another IBM 1200 bps Integrated Modem. Maximum: One per #2074. Limitations: Cannot be installed with #4145, #4800, #4805 or #5501; Will not interface to S/370 mdd 135 Integrated Communications Adapter (#4640). Field Installation: Yes. Prerequisites: BSCCA (#2074); Internal Clock (#4703). For local attachment to System/3-BSCCA-EIA-Local, ICA-Local, or LCA, an appropriate cable order is required. Installation Manual - Physical Planning, GA34-0004, will be updated to include cable description and ordering information.

IBM 1200 BPS INTEGRATED Modem, SWITCHED (#5501). [Mdls A and E only] Provides one IBM 1200 bps Integrated Modem which is suitable for communications over facility C4 with another IBM 1200 BPS Integrated Modem. This adapter includes the automatic answer capability. Maximum: One per #2074. Limitations: Cannot be installed with #4145, #4800, #4805 or #5501; Will not interface to S/370 mdd 135 Integrated Communications Adapter (#4640). Field Installation: Yes. Prerequisites: BSCCA (#2074); Internal Clock (#4703).

BSCCA COMMUNICATIONS FACILITIES

<table>
<thead>
<tr>
<th>Speed (bps)</th>
<th>Facilities</th>
<th>BSCCA Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200</td>
<td>C4, D6</td>
<td>4800, 5500, 5501, 4703</td>
</tr>
<tr>
<td>2400</td>
<td>C5, D6</td>
<td>4800, 4703</td>
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<tr>
<td>4800</td>
<td>C8, D8</td>
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<tr>
<td>7200</td>
<td>D9</td>
<td>4800</td>
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<tr>
<td>19.2K</td>
<td>E1</td>
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<td>48.8K</td>
<td>E2</td>
<td>4805</td>
</tr>
<tr>
<td>96.0K</td>
<td>E3</td>
<td>4805</td>
</tr>
</tbody>
</table>

IBM modems which may be attached to the BSCCA are the 3872, 3874, 3875. The IBM 1200 bps Integrated Modem is available as feature #5500 or #5501.

<table>
<thead>
<tr>
<th>Special Feature Prices:</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
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<tbody>
<tr>
<td>Cycle Steal Basic</td>
<td>#2662</td>
<td>$ 55</td>
<td>$110</td>
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<tr>
<td>5024 Attach Feature</td>
<td>4115</td>
<td>34</td>
<td>544</td>
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<tr>
<td>Async Comm Control</td>
<td>1610</td>
<td>96</td>
<td>1,955</td>
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<tr>
<td>Common Carrier Adapter</td>
<td>2165</td>
<td>10</td>
<td>261</td>
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<tr>
<td>Line Adapter.</td>
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<tr>
<td>Leased Line Type 1A</td>
<td>4751</td>
<td>31</td>
<td>651</td>
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<td>Leased Line Type 1B</td>
<td>4752</td>
<td>31</td>
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<td>Limited Dist Type 2B</td>
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<td>Binary Sync Comm Adapter</td>
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<td>Internal Clock</td>
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<td>Line Interface Type 1D</td>
<td>4800</td>
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<td>651</td>
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<td>Line Interface Type 1G</td>
<td>4805</td>
<td>63</td>
<td>1,305</td>
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<tr>
<td>IBM 1200 bps Integrated Modem Leased</td>
<td>5500</td>
<td>16</td>
<td>456</td>
</tr>
<tr>
<td>Switched</td>
<td>5501</td>
<td>24</td>
<td>608</td>
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</tbody>
</table>

† No Educational Allowance.
Specify Feature Codes have been added to the 5010 Processor Unit. These are no-charge features which identify the major application on the system.

**SPECIAL FEATURE ...**

Processing Unit -- major applications on order in the account.

Identifier (#9XXX) (All models).

<table>
<thead>
<tr>
<th>Code#</th>
<th>Feature (Application)</th>
<th>Code#</th>
<th>Feature (Application)</th>
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<tbody>
<tr>
<td>9001</td>
<td>Data Collection</td>
<td>9009</td>
<td>Lab. Applications</td>
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<tr>
<td>9002</td>
<td>Telephone Data Entry</td>
<td>9010</td>
<td>Stand-alone Scientific</td>
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<td>9003</td>
<td>Power Management</td>
<td>9011</td>
<td>Maritime</td>
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<td>Message Switching</td>
<td>9012</td>
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<td>9005</td>
<td>Other TP Applications</td>
<td>9013</td>
<td>CAMA</td>
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<td>9006</td>
<td>CAS</td>
<td>9014</td>
<td>ACLR</td>
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<tr>
<td>9007</td>
<td>Testing/Monitoring</td>
<td>9015</td>
<td>ACDMS</td>
</tr>
<tr>
<td>9008</td>
<td>Process Control</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Limitations: Only one feature code per 5010 can be specified.
5012 MULTIFUNCTION MODULE

Purpose: To provide digital input/output, analog input/output, and 2790 control on System/7.

Highlights: Provides capability for:
- Attachment of a 2790 Control.
- Up to 128 digital input points.
- Up to 32 isolated process interrupt points.
- Up to 64 digital output points.
- Up to 32 differential analog input points.
- Up to 2 isolated analog output points.

2790 Control: Provides the required logical interface for attachment of 2790 Data Communication devices to System/7. This allows System/7 to act as the “system controller” for 2791/2793 Area Stations or 2792 Remote Communication Controller. The 2790 Control allows transmission of data between System/7 and the 2791/2793 Area Stations (and 2795/2796/2797 Data Entry Units, and 2798 Guidance Display Units). Transmission rate is approximately 500,000 bits per second (900 characters per second). See 2790 in “Systems.” The combined number of 2791/2793s and 2792 mdls 1s on each 5012 or 5013 may not exceed 16. Maximum: Four 2790 Controls per system, one per 5012 Multifunction Module.

Digital Input -- provides up to 8 groups of 16 digital input points. Each digital input point is a voltage or contact sense, 2-terminal circuit. Each group can be program controlled for latching or non-latching operation. One of the eight groups may be read under direct program control. The first two groups of digital inputs may be converted to process interrupt points through the addition of the Process Interrupt feature.

Process Interrupt -- an "interrupt on change" feature is offered on the first two groups of digital inputs. This feature provides the capability to compare the input of 16 bit groups against a program loadable 16 bit register and initiate an interrupt on either an equal or unequal comparison.

Digital Output -- provides up to four groups of 16 digital output points. Each digital output point may be set or reset under program control. Each Digital Output group may be one of the following circuit types: Low Power, Medium Power, Non-Isolated, or Contact Output. Low Power output provides switching with a maximum rating of 6 volts at 4 milliamps. Medium Power and Medium Power. Non-Isolated output provides up to 48 volts at 450 milliamps. Contact Output provides a Form A mercury wetted relay contact rated at 125 V dc max or 88 V ac RMS max, 2A ac RMS max; the product of peak voltage and peak current must not exceed 100 (100 VA max). Digital outputs operate under direct program control. Medium Power and Contact Output points are isolated and may be directly connected to the standard Digital Input points. This provides the capability for wrap-around testing and multiplexing of digital and analog inputs with digital output points.

Analog Input -- provides up to eight groups of 8 differential analog input points. A multiplexer connects each point to an analog-to-digital converter. The converter is capable of reading cards and connectors in the range of ±10 millivolts to ±5.12 volts full scale, into binary values of 14 bits plus sign. Either an amplifier with a unit gain or an automatic gain amplifier must be selected. The unity gain or high-level amplifier provides a full scale range of ±5.12 volts. The multiplexer amplifier provides full scale ranges of ±10 mv, ±20 mv, ±40 mv, ±80 mv, ±160 mv, ±320 mv, and ±5.12 volts. Analog input is under direct program control. Immediate and External Synchronization operations are both available. Two analog scan rates are provided: #5246 uses a mercury wetted relay multiplexer operating at a scanning rate of up to 200 points per second. #5248 uses a solid state multiplexer operating at scanning rates up to 20K points per second, depending on the level of the input signal and mode of operation. For thermocouple operations, resistance bulb thermometers (RBT) are available. All of the 32 analog input points must use the same type of multiplexer in each Multifunction Module. The RBT capability is available only on the multiplexer amplifier.

Analog Output -- provides one or two isolated analog output voltages. The output signal has a polarized full scale range from 0 to 10.24 volts, with a resolution of 10 bits and an accuracy of ±0.15% of full scale. Polarity of the output signal depends on which side of the isolated output is grounded. Analog Output operates under direct program control at a rate of 25K (including amplifier settling time).

Attachment Accessories -- a customer access area is provided in the back of the I/O Module. Terminalization cards and connectors can be installed in this area to provide for connecting customer signals to the System/7 I/O interface. For detailed information, see Attachments for System/7 under 5029.

Maximum: The total number of Input/Output Modules (5012, 5013, 5014, and 5022 in any combination) per system cannot exceed 11.

PREREQUISITE: One module location in a 5026 Enclosure md1 A2, C3, C6, D3 or D6.

System/7 Summary: GA34-0002

SPECIFY: [1] For location of the 5012 I/O Module, specify: #9143 -- also enter the desired module location number, as shown in the chart on the 5026 page, in the quantity column of the order form. Specify #9142 in 5010 Processor Module.

#9144 -- for shipment without mounting in an enclosure (spare).

[2] Customer’s signal wires enter through the rear side panels of the module. Three types of side panels are available: Type 1 provides a slot for cables ..., Type 2 has individual holes for each pair of wires ..., Type 3 is a blank panel that can be customized by the customer. Separate side panels are used for digital and analog input signal wires. For details, refer to System/7 Installation Manual - Physical Planning, GA34-0004.

For Digital Input/Output specify one:
#5051 -- Side Panel Digital Type 1
#5052 -- Side Panel Digital Type 2
#5053 -- Side Panel Digital Type 3

For Analog Input specify one:
#5951 -- Analog Input Type 1
#5952 -- Analog Input Type 2
#5953 -- Analog Input Type 3

[3] When 2790 Control (#8195) is ordered on 5012 specify: #9444 (Multiplexing Device) for each module 5012 in a multipoint system.

Note: When upgrading from a single loop system, #9444 must be ordered for the installed 5012 which contains #8195. (It must also be ordered on MES for any 5013 which has #8195.)

PRICES: Md1 MRC Purchase MM/MMC
5012 A1 50 Study 49 $1,170 $11.50

Plan Offering: Plan B Warranty: A Maintenance: A
Purchase Option: 60% Useful Life Category: 2 Per Call: 2

FEATURES

2790 CONTROL (#8195). Interface for 2790 Data Communication devices. For 2790 devices supported by programming, see MSG/7 in "Programming." Limitation: Online diagnostics are available for maintenance of the 2790 - System/7 and must be implemented on all systems which include a 2792 or have more than sixteen area stations ... see page P.7.3, System/7 Macro Library/Relocatable. All 5012 and 5013 modules with 2790 Control (#8195) must reside within the same 5026 enclosure. See 2791/2793 Limitations, Loop Delay (2793 "Machines" page) for special configuring considerations. Maximum: One per 5012, four per System/7, MSG/7 provides support for a maximum of four 2792 mdls 1s (up to two per 2790 Control) or a maximum of sixty-four 2791/2792 mdls 1/2793s (16 per 2790 Control). Prerequisite: Customer signal connection required ... see 5029. Field Installation: Yes. Market Support: All bids of System/7 with three or four 2790 controls must be reviewed by the Boca Raton Sensor Based Market Support Center. This applies to upgraded systems as well as initial orders.

• ANALOG INPUT/OUTPUT

ANALOG BASIC (#1221). Provides the basic analog capability within the 5012. Maximum: One per 5012. Field Installation: Yes.

ANALOG OUTPUT CONTROL (#1245). Provides control for one or two Analog Output Points (#1246). Maximum: One per #1221. Field Installation: Yes. Prerequisite: Analog Basic (#1221).

ANALOG OUTPUT POINT (#1246). Provides a 0 to 10.24 volts isolated output signal. Polarity of the signal depends on the side of the signal that is grounded. Maximum: Two per #1245. Prerequisites: Analog Output Control (#1245) and its prerequisite ... customer signal connection required, see 5029. Field Installation: yes.

ANALOG INPUT OUTPUT CONTROL MOD B (#1232). Provides control and analog-to-digital conversion for an amplifier and 8 groups of mercury-wetted relay multiplexers. Multiplexing is at a maximum scanning rate of 200 points per second. Limitation: Cannot be ordered with Analog Input Output Mod C (#1231). Maximum: One per #1221. Field Installation: Yes. Prerequisite: Analog Basic (#1221).

AMPLIFIER HIGH LEVEL B (#1210). Provides a unity gain amplifier for high level analog input with an full scale range of ±5.12 volts. Limitation: Cannot be combined with Amplifier Multirange B (#1215). Maximum: One per #1232. Field Installation: Yes. Prerequisite: Analog Input Output Mod B (#1232).

AMPLIFIER MULTIRANGE B (#1215). Provides a multirange...
amplifier for analog input signals. Full scale ranges of ±10 mv, ±20 mv, ±40 mv, ±80 mv, ±160 mv, ±640 mv, and ±5.12 volts can either be preset under program control or automatically selected during the conversion process. With preset gains, a resolution of 14 bits plus sign is obtained. With auto ranging, a resolution of 12 bits plus sign and 3 bits for gain indication is obtained. Limitation: Cannot be ordered with Amplifier High Level B (#1210). Maximum: One per #1232. Field Installation: Yes. Prerequisite: Analog Input Control Mod B (#1232).

MULTIPLEXER/MR4 (#5248). Provides a group of 4 mercury wetted relay multiplexers for analog input signals. Multiplexing is at a maximum rate of 200 points per second. Signals may be in the range of 0 to ±5.12 volts. Maximum: B per #1210 or #1215. Field Installation: Yes. Prerequisites: Amplifier High Level B (#1215) ... customer signal connection required, see 5029.

ANALOG INPUT CONTROL MOD C (#1213). Provides control and analog-to-digital conversion for an amplifier and B groups of solid state multiplexers. Multiplexer scanning rate is up to 14K points per second for low level signals, and up to 20K points per second for high level inputs. For auto ranging mode, maximum scanning rate is 7K points per second. Limitation: Cannot be ordered with Analog Input Control Mod B (#1232). Maximum: One per #1213. Field Installation: Yes. Prerequisite: Analog Basic C (#1211).

AMPLIFIER HIGH LEVEL C (#1211). Provides a unity gain amplifier for high level analog input with a full scale range of ±5.12 volts. Limitation: Cannot be ordered with Amplifier Multirange C (#1216). Maximum: One per #1213. Field Installation: Yes. Prerequisite: Analog Input Control Mod C (#1213).

AMPLIFIER MULTIRANGE C (#1216). Provides a multirange amplifier for analog input signals. Full scale ranges of ±10 mv, ±20 mv, ±40 mv, ±80 mv, ±160 mv, ±640 mv, and ±5.12 volts can either be preset under program control or automatically selected during the conversion process. With preset gains, a resolution of 14 bits plus sign is obtained, while auto ranging provides a resolution of 12 bits plus sign and 3 bits for gain indication. Limitation: Cannot be ordered with Amplifier High Level C (#1211). Maximum: One per #1213. Field Installation: Yes. Prerequisite: Analog Input Control Mod C (#1213).

MULTIPLEXER/MS4 (#5248). Provides a group of 4 solid state multiplexers for analog input signals. Multiplexing is at a maximum scanning rate of 20,000 points per second. Signals may be in the range of 0 to ±5.12 volts. Maximum: B per #1211 or #1216. Field Installation: Yes. Prerequisites: One Amplifier High Level C (#1211), or Amplifier Multirange C (#1216) ... customer signal connection required, see 5029.

TEMPERATURE REFERENCE ATTACH (#7830). Provides the capability to attach Termination Cards containing resistance thermometers for determining the reference junction temperatures in thermocouple applications. See 5029. Maximum: One per #1221. Field Installation: Yes. Prerequisite: Amplifier Multirange B (#1215), or Amplifier Multirange C (#1216) ... customer signal connection required, see 5029.

DIGITAL INPUT/OUTPUT

DIGITAL INPUT CONTROL (#3284). Provides control for up to 4 Digital Input Control (#3289 or #3292). Maximum: Two per 5012. Field Installation: Yes. Prerequisite: Amplifier Multirange C (#1215) or Digital Input Control (#3289).

DIGITAL INPUT GROUP (#3289). Provides 16 latching on non-latching digital input voltage or contact points. The voltage or contact point and the isolation capability of each point is determined by the Termination Card used. Maximum: Four #3289 or #3292 in any combination per #3284. Field Installation: Yes. Prerequisites: Digital Input Control (#3284) ... customer signal connection required, see 5029.

PROCESS INTERRUPT (#5710). Converts a Digital Input Group (#3289) to a process interrupt group. Limitation: #5710 cannot be installed on Digital Input Non-Isolated (#3292). Maximum: Two per 5012 ... can only be used with the first two groups of Digital Input Group (#3289) in a 5012. Field Installation: Yes. Prerequisite: Digital Input Group (#3289).

DIGITAL INPUT NON-ISOLATED (#3292). Provides 16 latching or non-latching points of contact or digital inputs. Input signals are referenced to frame ground. Limitation: Cannot be modified by Process Interrupt (#5710). Maximum: Four #3289 or #3292 in any combination per #3292. Field Installation: Yes. Prerequisites: Digital Input Control (#3284) ... customer signal connection required, see 5029.


DO CONTACT GROUP (#3420). Provides 16 isolated single pole Form A mercury wetted relay contacts rated at 125 V dc max or 88 V ac RMS, 2A ac RMS max; the product of peak voltage and peak current must not exceed 100 (100 VA max.). Maximum: Four #3420, 3421, 3422, 3424 in any combination per #3296. Field Installation: Yes. Prerequisites: Digital Output Control (#3296) ... customer signal connection required, see 5029.

DO LOW POWER GROUP (#3421). Provides 16 low power (4 ma, 6 V) digital output points. No output power is required. Maximum: Four #3420, 3421, 3422, 3424 in any combination per #3296. Field Installation: Yes. Prerequisites: Digital Output Control (#3296) ... customer signal connection required, see 5029.

DO MEDIUM POWER GROUP (#3422). Provides 16 medium power solid state digital output switches. Power, up to 48 V dc, and 450 ma, must be provided by the user. Maximum: Four #3420, 3421, 3422, 3424 in any combination per #3296. Field Installation: Yes. Prerequisites: Digital Output Control (#3296) ... customer signal connection required, see 5029.

DO MEDIUM POWER NON-ISOLATED (#3424). Provides 16 non-isolated medium power (0 ma at 5.5 V to 12 ma at 2.4 V supplied by IBM) solid state digital output switches. Output signals are referenced to frame ground. Customer provided loads up to 450 ma at 52.8 V dc can be switched. Maximum: Four #3420, 3421, 3422, 3424 in any combination per #3296. Field Installation: Yes. Prerequisites: Digital Output Control (#3296) ... customer signal connection required, see 5029.

Feature Prices:

<table>
<thead>
<tr>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2790 Control</td>
<td>$128</td>
<td>$2,610</td>
</tr>
</tbody>
</table>

Analog Input/Output

Amplifier High Level B | 1210 | 10 | 327 | 1.00 |
Amplifier High Level C | 1211 | 63 | 1,305 | 7.00 |
Amplifier Multirange B | 1215 | 49 | 1,045 | 2.50 |
Amplifier Multirange C | 1216 | 101 | 2,085 | 2.50 |
Analog Basic | 1221 | 36 | 78 | 2.00 |
Analog Input Control Mod B | 3282 | 128 | 3,185 | 40.50 |
Analog Input Control Mod C | 3283 | 70 | 4,245 | 54.00 |
Analog Output Control | 3284 | 36 | 780 | 12.50 |
Analog Output Point | 3285 | 49 | 1,305 | 7.50 |
Multiplexer/MR4 | 5245 | 11 | 287 | 2.50 |
Multiplexer/MS4 | 5248 | 10 | 261 | 1.50 |
Temp. Ref. Attachment | 7830 | 10 | 261 | 1.50 |

Digital Input/Output

Digital Input Control | 3284 | 13 | 352 | 2.50 |
Digital Input Control | 3289 | 16 | 391 | 5.00 |
Digital Input Non-Isolated | 3292 | 8 | 196 | 1.50 |
Digital Input Control | 3296 | 24 | 522 | 2.00 |
DO Contact Group | 3420 | 49 | 1,045 | 6.50 |
DO Low Power Group | 3421 | 24 | 522 | 3.50 |
DO Medium Power Group | 3422 | 36 | 780 | 7.00 |
DO Medium Power Non-Isolated | 3424 | 16 | 391 | 2.00 |
Process Interrupt | 5710 | 10 | 261 | 1.50 |

ATTACHMENT ACCESSORIES – Termination Cards and connectors for customer signal wires are provided as accessories in the 5029. For details, see 5029.

Note: Specifications stated in the sales manual are a generalized description of the system features. Detail specifications for System/7 Sensor I/O features must be quoted or proposed from the latest revision of the IBM System/7 Installation Manual - Physical Planning, GA34-0004.
5013 DIGITAL INPUT/OUTPUT MODULE

Purpose: To provide digital input/output, expansion capability for custom products, and 2790 control on a System/7.

Highlights: Designed specifically to provide expansion capability for applications that require custom products along with digital input/output and 2790 control.

Expansion Capability -- provides the space, power, and logical interface to attach various Custom Products to System/7.

2790 Control: Provides the required logical interface for attachment of 2790 Data Communication devices to System/7. This allows System/7 to act as the “System Controller” for 2791/2793 Area Stations or 2792 Remote Communication Controller. The 2790 Control allows transmission of data between System/7 and 2791, 2792, 2793 Area Stations (and 2795/2796/2787 Data Entry Units, and 2798 Guidance Display Units). Transmission rate is approximately 500,000 bits per second (950 characters per second). See 2790 in “Systems”. The combined number of 2791/2793s and 2792 mdls 1s on each 5012 or 5013 may not exceed 16. Maximum: Four 2790 Controls per system, one per 5013 Digital Input/Output Module.

Digital Input -- provides up to 8 groups of 16 digital input points. Either isolated or non-isolated Digital Input groups are available. Each digital input point is a voltage or contact sense, 2-terminal circuit. Each group can be program controlled for latching or non-latching operation. Any one of the 8 groups may be read under direct program control. The first two groups of digital inputs may be converted to process interrupt points through the addition of the Process Interrupt feature.

Process Interrupt -- an “interrupt on change” feature is offered on the first two inputs of digital inputs. This feature provides the capability to compare the input of the 16-bit groups against a program loadable 16-bit register and initiate an interrupt on either an equal or unequal comparison.

Digital Output -- provides up to 4 groups of 16 digital output points. Each digital output point may be set or reset under program control. Each Digital Output group may be one of the following circuit types: Low Power, Medium Power, Medium Power Non-Isolated, or Contact output. Low Power output provides switching with a maximum rating of 6 volts at 4 milliamps. Medium Power and Medium Power Non-Isolated operate up to 48 volts at 450 milliamps. Contact Output provides a Form A mercury wetted relay contact rated at 125 V dc max or 88 V ac RMS max, 2 A ac RMS max; the product of peak voltage and peak current must not exceed 100 (100 VA max). Digital outputs operate under direct program control. Medium Power and Contact Output points are isolated and may be directly connected to the standard Digital Input points. This feature provides wrap-around testing and multiplexing of digital and analog inputs with digital output points.

Maximum: The total number of Input/Output Modules (5012, 5013, 5014 and 5022 in any combination) per system may not exceed 11.

Prerequisite: One module location in a 5026 Enclosure mdl A2, C3, C6, D3 or D6.

System/7 Summary: GA34-0002

Specify: [1] For location of the 5013 I/O Module, specify: #9143 -- also enter the desired module location number, as shown in the chart on page M 5026, in the quantity column of the order form. Specify #9142 in the 5010 Processor Module.

#9144 -- for shipment without mounting in an enclosure (spare).

[2] Customer’s signal wires enter through the rear side panels of the module. Three types of side panels are available: Type 1 provides a slot for cables; Type 2 has individual holes for each pair of wires; Type 3 is a blank panel that can be customized by the customer. Separate side panels are used for digital and analog input signals. For details, refer to IBM System/7 Installation Manual - Physical Planning, GA34-0004.

For Digital Input/Output specify one:

#9501 -- Side Panel Digital Type 1
#9502 -- Side Panel Digital Type 2
#9503 -- Side Panel Digital Type 3

[3] When 2790 Control (#8195) is ordered on 5013 specify: #9444

(Multiloop Device) for each new 5013 in a multiloop system.

Note: When upgrading from a single loop system, #9444 must be ordered for the installed 5013 which contains #8195.

PRICES: Mdl 5013 A1 $ 49 $1,170 $ 9.50

Plan Offering: Plan B Warranty: A Maintenance A Purchase Option: 60% Useful Life Category: 2 Per Call: 2

SPECIAL FEATURES

2790 CONTROL (#8195). Interface for 2790 Data Communication devices. For 2790 devices supported by programming, see MSP/7 in "Programming." Limitation: Up to 64 digital output points and may not exceed 16 area stations -- see page P7.3 Macro Library/Reference. All 5013 modules with 2790 Control (#8195) must reside within the same 5026 Enclosure. See 2791/2793 Limitations, Loop Delay (2793 "Machines" page) for special configuring considerations. Maximum: One per 5013, four per System/7. MSP/7 provides support for a maximum of four 2792 mdl 1s (up to two per 2790 control) or a maximum of sixty-four 2791/2792 mdl 1/2793s (16 per 2790 control). Field Installation: Yes. Prerequisite: Customer signal connection required, see 5029.

DIGITAL INPUT/OUTPUT FEATURES

DIGITAL INPUT CONTROL (#3284). Provides control of up to 4 Digital Input (#3289 or #3292) groups. Maximum: Two per 5013. Field Installation: Yes.

DIGITAL INPUT GROUP (#3289). Provides 16 latching or non-latching digital input voltage or contact points. The voltage or contact and the isolation capability of each point is determined by the Termination Card used. Maximum: Four #3289 or #3292 in any combination per #3284. Field Installation: Yes. Prerequisite: Digital Input Control (#3284) ... customer signal connection required, see 5029.

PROCESS INTERRUPT (#5710). Converts a Digital Input Group (#3289) to a process interrupt group. Limitation: #75710 cannot be installed on Digital Input Non-Isolated (#3292). Maximum: Four per 5013, can only be used with the first two groups of Digital Input Group (#3289) in a 5013. Field Installation: Yes. Prerequisite: Digital Input Group (#3289) and its prerequisite.

DIGITAL INPUT NON-ISOLATED (#3292). Provides 16 latching or non-latching points of contact sense capability. Input signals are referenced to frame ground. Limitation: Cannot be modified by Process Interrupt (#5710). Maximum: Four #3289 or #3292 in any combination per #3284. Field Installation: Yes. Prerequisite: Digital Input Control (#3284) ... customer signal connection required, see 5029.


DO CONTACT GROUP (#3420). Provides 16 isolated single pole Form A mercury wetted relay contacts rated at 125 V dc max or 88 V ac RMS max, 2 A ac RMS max; the product of peak voltage and peak current must not exceed 100 (100 VA max). Maximum: Four #3420, 3421, 3422, 3424 in any combination per #3296. Field Installation: Yes. Prerequisite: Digital Output Control (#3296) ... customer signal connection required, see 5029.

DO LOW POWER GROUP (#3421). Provides 16 low power (4 ma, 6 V) digital output points. No user power supply is required.

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DP Machines

5013 Digital Input/Output Module (cont'd)

Maximum: Four #3420, 3421, 3422, 3424 in any combination per #3296. Field Installation: Yes. Prerequisites: Digital Output Control (#3296)...customer signal connection required, see 5029.

DO MEDIUM POWER GROUP (#3422). Provides 16 isolated medium power solid state digital output switches. Power, up to 48 V dc and 450 ma, must be provided by the user. Maximum: Four #3420, 3421, 3422, 3424 in any combination per #3296. Field Installation: Yes. Prerequisites: Digital Output Control (#3296)...customer signal connection required, see 5029.

DO MEDIUM POWER NON-ISOLATED (#3424). Provides 16 non-isolated medium power (0 ma at 5.5 V to 12 ma at 2.4 V supplied by IBM) solid state digital output switches. Output signals are referenced to frame ground. Customer powered loads up to 450 ma at 52.8 V dc can be switched. Maximum: Four #3420, 3421, 3422, 3424 in any combination per #3296. Field Installation: Yes. Prerequisites: Digital Output Control (#3296)...customer signal connection required, see 5029.

Special Feature Prices:

MAC/ MRC Purchase MMMC

2790 Control #8195 $128 $2,610 $9.50

Digital Input/Output Features

Digital Input Control 3284 13 352 2.50
Digital Input Group 3289 16 391 4.50
Digital Input Analog Isolated 3292 8 156 1.50
Digital Output Control 3296 24 522 2.00
DO Contact Group 3420 49 1,045 5.50
DO Low Power Group 3421 24 503 3.00
DO Medium Power Group 3422 36 780 6.00
DO Med Power Non-Isolated 3424 16 391 2.00
Process Interrupt 5710 10 281 1.50

ATTACHMENT ACCESSORIES: Termination Cards and connectors for customer signal wires are provided as accessories in the 5029 mdl 1. For details, see M 5029.

Note: Specifications stated in the sales manual are a generalized description of the system features. Detail specifications for System/7 Sensor I/O features must be quoted or proposed from the latest version of the IBM System/7 Installation Manual - Physical Planning, GA34-0002.

5014 ANALOG INPUT MODULE

Purpose: To provide System/7 with the capability to use voltage signals as input data. The 5014 Analog Input Module provides capability for up to 128 analog input points.

Model B1 -- Scanning rate up to 200 points per second.

Model C1 -- Scanning rate up to 20,000 points per second.

Model D1 -- Scanning rate up to 100 points per second.

Model E1 -- Expander for 5014 model D1.

Model E2 -- Expander for 5014 model B1.

Model Changes: Changes between model E1 and model E2 are field installable. Model changes from B to C to D to E are not recommended for field installation.

Highlights: Provides analog input capability including multiplexing, amplification, and analog-to-digital conversion. Five models are available: Model B1 uses mercury wetted relay multiplexers with a maximum scanning rate of 200 points per second; Model C1 uses a solid state multiplexer with a maximum scanning rate of 7,000 to 20,000 points per second; Model D1, with a maximum scanning rate of 100 points per second, uses either mercury wetted or dry contact relay multiplexers; Model E1 is an expander module connected to model D1 sharing the amplifier and analog-to-digital converter of the model D1 and using either type of multiplexer; Model E2 is an expander module connected to model B1 sharing the amplifier and analog-to-digital converter of the model B1 and using mercury wetted relay multiplexers. Input signals may range from +640 mv to +5.12 volts full scale with dry contact relay multiplexers.

The analog-to-digital converter has a resolution of 14 bits plus sign. Analog conversion and point addressing of the multiplexers are under program control. Immediate and external synchronization operate in both installable. A special feature provides for attachment of resistance bulb thermometer (RBT) termination cards for determining the reference junction temperature in thermocouple applications. Conversion of customer signals and signal conversion is achieved by termination cards in the customer access area at the back of the Analog Input Module. LIMITATIONS: The first model E1 must be located directly under the associated model D1. The second model E1 must be located directly under the first model E1. The first model E2 must be located directly under its associated model B1. The second model E2 must be located directly under the first model E2.

Maximum: Total number of Input/Output Modules (5012, 5013, 5014, 5022, and Customer Product Modules in any combination) per system cannot exceed 11.

PREREQUISITE: One module location in 5026 Enclosure mdls A2, C3, C6, D3 or D6.

System/7 Summary: GA34-0002

Specify: [1] For location of the 5014 I/O Module, specify: #143 -- also enter the desired module location number, as shown in the chart on page M 5026, in the quantity column of the order form. Specify #9142 in the 5010 Processor Module.

#9144 -- for shipment without mounting in an enclosure (spare).

[2] Customer’s signal wires enter through the rear side panels of the module. Three types of panels are available. Type 1 provides a slot for cables; Type 2 has individual holes for each pair of wires; Type 3 is a blank panel that can be customized by the customer. For details refer to IBM System/7 Installation Manual - Physical Planning, GA34-0002. Specify One:

#9511 -- Side Panel Analog Type 1

#9512 -- Side Panel Analog Type 2

#9513 -- Side Panel Analog Type 3

[3] On each 5014 mdl 3 specify one of the following: #9185 -- for expansion from 128 to 256 points. (First 5014 mdl E is connected to a single model D1 B or D). #9186 -- for expansion from 256 to 384 points. (Second 5014 mdl E is connected to a single model D1 B or D).

PRICES: Mdl MRC Purchase MMMC

5014 B1 $193 $3,905 $40.50

C1 283 6,725 59.50

D1 393 8,000 45.00

E1 48 1,020 1.00

E2 48 1,020 1.00

Plan Offering: Plan B Warranty: A Maintenance: B

Purchase Option: 60% Useful Life Category: 2 Per Call: 2

MODEL DESCRIPTIONS

Model B1 -- provides amplification, analog-to-digital conversion, and addressing of 128 analog input points at a scanning rate up to 200 points per second using mercury wetted relay multiplexers. A special feature provides addressing for an additional 256 points in two other detectors. For details refer to IBM System/7 Installation Manual - Physical Planning, GA34-0004.

Model C1 -- provides amplification, analog-to-digital conversion, and addressing of 128 analog input points at a scanning rate up to 20,000 points per second using solid state multiplexers. The maximum scanning rate is dependent upon the input signal level and mode of operation. Low level signals may be scanned at a maximum rate of 14,000 points per second. High level signals may be scanned at a maximum rate of 20,000 points per second. Maximum scanning rate with auto ranging is 7,000 points per second.

Model D1 -- provides amplification, analog-to-digital conversion, and addressing of 384 analog input points at a scanning rate up to 100 points per second using mercury wetted relay or dry contact relay multiplexers. The first 128 points of relay multiplexers are installed in the model D1. The second 128 points of relay multiplexers are installed in a model E1 attached to the model D1. The third 128 points of relay multiplexers are installed in a model E1 attached to the first model E1.

Model E1 -- expansion model for model D1. Provides for 128 analog input points selected by mercury wetted relay or dry contact relay multiplexers. It is connected to and uses the amplification, analog-to-digital conversion, and addressing circuits of a model D1. The maximum scanning speed is the same as the model D1 (100 points per second). LIMITATION: The first model E1 must be located directly under the model D1 to which it is attached. The second model E1 must be connected directly under the first model E2. MAXIMUM: Two per 5014 mdl B1. PREREQUISITE: Analog Input Expander (#1250) on the 5014 mdl D1.

Model E2 -- expansion module for model B1. Provides for 128 analog input points selected by mercury wetted relay multiplexers. It is connected to and uses the amplification, analog-to-digital conversion, and addressing circuits of a model B1. The maximum scanning speed is the same as the model B1 (500 points per second). LIMITATION: The first model E2 must be located directly under the model B1 to which it is attached. The second model E2 must be located directly under the first model E2. MAXIMUM: Two per 5014 mdl B1. PREREQUISITE: Analog Input Expander (#1250) on the 5014 mdl B1.

SPECIAL FEATURES

AMPLIFIER HIGH LEVEL B (#1210). [mdl B1 only] Provides a

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That the ±5.12 volt range is modified to the range of ±640mV to ±5.12 volts. Limitation: Cannot be ordered with Amplifier Multirange B (#1211). Maximum: One per 5014 mddl B1. Field Installation: Yes.

AMPLIFIER HIGH LEVEL C (#1211). [mdl C1 only] Provides a unity gain amplifier for high level analog input signals with a full scale range of ±5.12 volts. Limitation: Cannot be ordered with Amplifier Multirange C (#1216). Maximum: One per 5014 mddl C1. Field Installation: Yes.

AMPLIFIER HIGH LEVEL D (#1212). [mdl D1 only] Provides a unity gain amplifier for high level analog input signals with a full scale range of ±5.12 volts. Limitation: Cannot be ordered with Amplifier Multirange D (#1217). Maximum: One per 5014 mddl D1. Field Installation: Yes.

AMPLIFIER MULTIRANGE B (#1215). [mdl B1 only] Provides a multirange amplifier for analog input signals. The amplifier gains can be set by the program or determined automatically by the amplifier. Amplifier ranges are ±10mV, ±20mV, ±40mV, ±80mV, ±160mV, ±320mV, and ±5.12 volts full scale. In program selected gain mode of operation, 12 bits of data plus sign are generated. In auto ranging mode of operation, 12 bits of data plus sign are generated. The remaining 3 bits are used to indicate the range. Limitation: Cannot be ordered with Amplifier High Level B (#1212). Maximum: One per 5014 mddl B1. Field Installation: Yes.

AMPLIFIER MULTIRANGE C (#1216). [mdl C1 only] Provides a multirange amplifier for analog input signals. The amplifier gains can be set by the program or determined automatically by the amplifier. Amplifier ranges are ±10mV, ±20mV, ±40mV, ±80mV, ±160mV, ±320mV, and ±5.12 volts. In program selected gain mode of operation, 12 bits of data plus sign are generated. In auto ranging mode of operation, 12 bits of data plus sign are generated. The remaining 3 bits are used to indicate the range. Limitation: Cannot be ordered with Amplifier High Level C (#1211). Maximum: One per 5014 mddl C1 Field Installation: Yes.

AMPLIFIER MULTIRANGE D (#1217). [mdl D1 only] Provides a multirange amplifier for analog input signals. The amplifier gain is set by the program or determined automatically by the amplifier. Amplifier ranges are ±10mV, ±20mV, ±40mV, ±80mV, ±160mV, ±320mV, and ±5.12 volts. When used with Multiplexer/MR16 (#5247), the full scale ranges are ±10mV, ±20mV, ±40mV, ±80mV, ±160mV, ±320mV, and ±5.12 volts. Limitation: Cannot be ordered with Amplifier Multirange D (#1217). Maximum: One per 5014 mddl D1. Field Installation: Yes.


ANALOG INPUT ADAPTER C (#1231). [mdl C1 only] Provides capability for two Multiplexer/MS16 (#5249) groups. Maximum: Four per 5014 mddl C1. Field Installation: Yes. Prerequisite: Amplifier High Level C (#1211) or Amplifier Multirange C (#1216).

ANALOG INPUT ADAPTER D/E (#1233). [mdl D1 and E1 only] Provides capability for two Multiplexer/MR16 (#5247) groups on mdds D1, E1, E2, or two Multiplexer/MS16 (#5249) groups on mdds B1, C1. Maximum: Four per 5014 mdds D1, E1, E2. Field Installation: Yes. Prerequisite: Amplifier High Level D (#1212) or Amplifier Multirange D (#1217) on 5014 mddl D1.

ANALOG INPUT EXPANDER B (#1250). [mdl B1 only] Provides the capability to attach one or two 5014 mddl E2s to a 5014 mddl B1. This provides up to 384 analog input point addresses on a 5014 mddl B1. Maximum: One per 5014 mddl B1. Field Installation: Yes. Prerequisite: Amplifier High Level B (#1212) or Amplifier Multirange B (#1215).

MULTIPLEXER/MR16 (#5247). [mdl D1 and E1 only] Provides a group of 16 analog input points. Input points are multiplexed by dry contact relays. Input signals can be in the range of ±40mV to ±5.12 volts. Limitation: The combined quantity of Multiplexer/MR16 (#5245) and Multiplexer/MR16 (#5247) must not exceed two per Analog Input Adapter D/E (#1233). Common mode voltage must not exceed 100 volts and the average sampling rate per point must not exceed 20 samples per minute when averaged over at least 24 hours. This means that a single input point must be addressed more than 28,800 times in 24 hours. Maximum: Two per Analog Input Adapter D/E (#1233). Field Installation: Yes. Prerequisite: Amplifier Input Adapter D/E (#1253). Customer signal connection required, see 5029.

MULTIPLEXER/MS16 (#5249). [mdl C1 only] Provides a group of 16 analog input points. Input points are multiplexed by solid state switches. Input signals can be in the range of ±5.12 volts. Limitation: Common mode voltage must not exceed 10 volts and the average sampling rate is not limited. Maximum: Two per Analog Input Adapter C (#1231). Field Installation: Yes. Prerequisite: Amplifier Multirange B (#1215), Amplifier Multirange C (#1216) or Amplifier Multirange D (#1217).

Maximum: Two per Analog Input Adapter B (#1230) or Analog Input Adapter D/E (#1233). Field Installation: Yes. Prerequisites: Analog Input Adapter B (#1230) on 5014 mddl B1 or Analog Input Adapter D/E (#1233) on mdds D1, E1 or E2. Customer signal connection required, see 5029.

MULTIPLEXER/MS16 (#5249). [mdl C1 only] Provides a group of 16 analog input points. Input points are multiplexed by solid state switches. Input signals can be in the range of ±5.12 volts. Limitation: Common mode voltage must not exceed 10 volts and the average sampling rate is not limited. Maximum: Two per Analog Input Adapter C (#1231). Customer signal connection required, see 5029.

TEMPERATURE REFERENCE ATTACH (#7830). [mdl B1, C1, or D1 only] Provides the capability to attach termination cards containing resistance bulb thermometers (RBT) ... see M 5029. When this feature is installed in a 5014 mddl B1 or D1 the capability is extended to 5014 mddl E1 or E2 associated with it. Limitation: A maximum of 32 RBT termination cards can be attached to one Temperature Reference Attach (#7830). Maximum: One per 5014 mdds B1, C1 and D1. Field Installation: Yes. Prerequisite: Amplifier Multirange B (#1215), Amplifier Multirange C (#1216) or Amplifier Multirange D (#1217).

Special Feature Prices:

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Maximum Feature Quantity Per Model

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5022 DISK STORAGE MODULE

Purpose: Disk Storage Unit for System/7.

Model 1 Single Drive -- 2,457 million 16-bit words... access 200 cylinders on removable cartridge and 200 cylinders on its non-removable disk... 269 milliseconds average access time.

Model 2 Single Drive -- same as Model 1 except 126 milliseconds average access time.

Model 3 Single Drive -- 1,228 million 16-bit words... access 200 cylinders on one non-removable disk... average access time 269 milliseconds.

Model 4 Single Drive -- same as Model 3 except 126 milliseconds average access time.

Model Changes: Field Installable.

Highlights:

Removable Disk Cartridges -- each 5022 mdl 1 or 2 uses a removable 5440 Disk Cartridge that provides virtually unlimited offline disk storage. 5440s must be ordered separately.

Cylinder Concept -- the access mechanism with four vertically aligned heads gives access to the top and bottom tracks of both the removable 5440 and the 5022's non-removable disk for model 1 or model 2. With one positioning of the access mechanism, 12,288 sixteen-bit words are available.

The access mechanism on model 3 or model 4 with two vertically aligned heads gives access to the top and bottom tracks of the non-removable disk, providing 6,144 sixteen-bit words with one positioning of the access mechanism.

Formats -- each of the 200 customer usable cylinders, three alternate cylinders and one CE cylinder on each disk is composed of two tracks of 24 sectors each. Each sector provides a fixed length 128 word data field.

Housing -- the 5022 can reside in an I/O module location in any of the 5026 enclosures. However, it is recommended that it be installed in the bottom module location for user accessibility... see "Specify" [1] below.

Access Times -- minimum access time is 39 milliseconds, average is 269 milliseconds and maximum is 750 milliseconds for model 1 or model 2.

Minimum access time is 28 milliseconds, average is 126 milliseconds and maximum is 255 milliseconds for model 2 or model 4.

Data Transfer Rate -- the disk rotates at 1500 rpm, yielding a data rate of 99,500 words per second and a rotational period of 40 milliseconds.

PREREQUISITES:

(1) An available I/O module location in the 5026 Enclosure.
(2) Each 5022 mdl 1 or 2 requires a 5440 Disk Cartridge.
(3) Integral Power Supply (#4650) is required for:
   a) Each additional 5022 after the first 5022 within a single 5026 Enclosure.
   b) A 5022 installed in a 5026 mdl A2.

Configuration: Multiple 5022s may be installed on a single System/7. IBM supplied programming support for the Disk Cycle Steal (#2664) feature is mutually exclusive with Direct Program Control Disk support. Drives of both types are not supported on the same system. Multiple drives of either type are supported.

System/7 Summary: GA34-0002

Specify: [1] For location of the 5022 Disk Storage Module, specify: #9143 - also enter the desired module location number, as shown under the 5026, in the quantity column of the order form. #9144 - for shipment without mounting in an enclosure (spare). LIMITATIONS: the following limitations apply to the location where a 5022 module can be installed in a 5026 Enclosure:
   a) A 5022 cannot be located in a top position of a 5026 (module locations 0, 3, 6 or 9).
   b) It is recommended that 5022s be located in the bottom position of a 5026 enclosure (module locations 2, 5, 8 or 11). Only when absolutely necessary should a 5022 be located in the middle position of a 5026 enclosure (module locations 1, 4, 7 or 10).
   c) Locating a 5022 mdl 3 or 4 in the bottom position of a 5026 enclosure in systems without Internal Air Isolation (#4621 or #4622) will increase the maximum allowable operating temperature from 90°F to 105°F.
   d) Housing a 5022 in a 5026 mdl D3 or D6 is not recommended due to the increased processor loading during data transfer.


SPECIAL FEATURES

DISK CYCLE STEAL (#2664). Provides data transfers between the 5022 and main storage of a 5010 equipped with companion Cycle Steal Basic (#2662) feature. Limitation: One per 5022. Field Installation: Yes. Prerequisite: Cycle Steal Basic (#2662) on the 5010.

INTEGRAL POWER SUPPLY (#4650). Provides 24 volts power supply which is required for: (1) Installation of each additional 5022 after the first 5022 within a single 5026 Enclosure, and (2) Installation of a 5022 on a 5026 enclosure mdl A2. Field Installation: Yes.

Special Feature Prices:

MAC/ MRC Purchase MMMC

Disk Cycle Steal #2664 $ 16 $ 391 $ 1.00

Integral Power Supply 4650 42 908 1.00

Environment: The 5022 operates within the following temperature and humidity range.

Temperature ** 60-90°F
Relative Humidity 8-95%
Max. Wet Bulb Temperature 85°F
Non-operating Temperature 50-110°F
Non-operating Humidity 8-95%

** In systems without Air Isolation (#4621 or #4622 on 5026), the maximum operating temperature for a 5022 mdl 3 or 4 (fixed pack) is 105°F if the disk is located in the bottom position of a 5026 Enclosure (module locations 2, 5, 8 or 11).

[2] Each 5022 mdl 1 or mdl 2 requires a 5440 Disk Cartridge which must be ordered separately.

M 5022
May 79
5024 I/O ATTACHMENT ENCLOSURE

Purpose: To provide line printing and/or card reading capability for System/7.

Model 1: Basic Enclosure with Line Printer.
Model 2: Basic Enclosure with 2502 Attachment.
Model 3: Expanded Enclosure with Line Printer and 2502 Attachment.

Highlights:

Enclosure -- the 5024 I/O Attachment Enclosure is a data processing oriented addition to the System/7. The enclosure provides basic space, power and logic to attach a printer, a card reader, or both. If both a printer and a card reader are utilized, an enclosure expansion is provided. The 5024 attaches to any 5010 Processor Module Model E equipped with 5024 Attachment Feature (##4115). A fixed length cable is supplied with the 5024 (see Physical Planning Manual for further details).

5024 Attachment Feature (##4115) on 5010 -- provides the interface between the 5010 mdl E and the 5024 and handles data transfers between 5010 mdl E storage and the 5024 on a cycle steal basis. Cycle Steal Basic (##2662) is required on the 5010 mdl E. If both a card reader and a printer are attached, operations may be interleaved but not overlapped. In the interleave mode of operation, performance of the devices will be less than the individual unit's rated speed of 300 cpm reading and 155 lpm printing. For more details see SRL GA34-0002. Only one 5024 may be attached per 5010 mdl E. The 5024 attachment is mutually exclusive with 1200 bps Integrated Moderns (##5500, 5501) and S/360/370 Channel Attachment (RPQ). All systems planning to use any 5010 RPQ together with Feature Code ##4115 must re-submit the RPQ for evaluation.

PREREQUISITES: Cycle Steal Basic (##2662) and 5024 Attachment Feature (##4115) on a 5010 mdl E Processor. For 5024 mdl 2 or 3, a 2502 mdl A2 with specify feature #9901 for 115 V AC, and #9046 for white color.

System/7 Summary: GA34-0002

Input Power: 115 V AC, 1-phase, 60 Hz.
[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.
[3] Print Belt: Specify one -- #9490 for 96-character belt, #9491 for 64-character belt, or #9492 for 48-character belt. (Not on model 2)

PRICES: Mdl MAC/ MLC Purchase MMMC
      MRC 2 yr
5024 1 $ 578 492 $18,040 $107.00
    2  330 281 10,340  20.00
    3  768 654 22,500 114.00

Plan Offering: Plan B Warranty: B Maintenance: D
Purchase Option: 55% Useful Life Category: 2
Termination Charge Months: 5 Termination Charge Percent: 25%
Upper Limit Percent: 0%

Model Changes: Changes from Model 1 or Model 2 to Model 3 are field installable. No other model changes can be made.

5024 Model 1 to Model 3 ...... $ 4,460
5024 Model 2 to Model 3 ...... $12,160

ACCESSORIES

FORMS STAND (##4450). Permits placement of continuous forms (out of carton) on the stand above floor level and provides for forms stacking after printing. This stand or equivalent is required for proper operation of the 5024 mdl 1 or 3. Field Installation: Yes.

ADDITIONAL PRINT BELT (##5550, 5551, 5552). Permits the customer to obtain more than one character set print belt for various applications. Order #5550 for 96-character belt, #5551 for 64-character print belt, #5552 for 48-character print belt. 48 character belt utilizes a character set with \%, (and ) rather than c, % and, respectively. Field Installation: Yes.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Forms Stand</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>#4450</td>
<td>Purchase Only</td>
<td>$ 51</td>
<td>NC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Additional Print Belt</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>96-character</td>
<td>5550</td>
<td>Purchase Only</td>
<td>170</td>
</tr>
<tr>
<td>64-character</td>
<td>5551</td>
<td>Purchase Only</td>
<td>170</td>
</tr>
<tr>
<td>48-character</td>
<td>5552</td>
<td>Purchase Only</td>
<td>170</td>
</tr>
</tbody>
</table>

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5026 ENCLOSURE

Purpose: To provide housing and power for System/7 Processor and Input/Output Modules.

Model A2 2 Position ... for a Processor Module and one I/O Module.

Model C3 3 Position ... for a Processor Module and two I/O Modules.

Model C6 6 Position ... for a Processor Module and five I/O Modules.

Model D3 3 Position Extension ... 3 additional I/O Module locations with C3 or C6.

Model D6 6 Position Extension ... 6 additional I/O Module locations with C3 or C6.

Model D3 or D6 is cable attached to model C3 or C6 and may be located up to 200 feet from the model C3 or C6.

Highlights: Provides housing for the Processor Module and all Input/Output Modules. Also included are the necessary power supplies (see RPO for power restrictions on 3340 Attachment) and interface connections for all modules. The Processor Module must be located in the first module location of A2, C3 or C6 models. I/O Modules may be housed in any of the remaining module locations, except Module 5998-TO 1 must be located in module position 2 and if it is installed a 5022 module may not be located in module position 1. The D3 or D6 model may be located up to 200 feet from the C3 or C6 model. An Internal Air Isolation feature (not available on model A2) seals the enclosure and prevents the outside air from entering into the enclosure. Internal air is filtered through an activated carbon filtration system. Heat within the enclosure is dissipated through an air-to-air heat exchanger. This feature allows the System/7 to be used in environments where airborne elements might harm the electronic circuitry. Since this feature is not available on model A2 enclosures, in environments where there is a possibility of existence of contaminants, a C3 or C6 model must be used.

An “Early Warning” corrosion detector card is installed as a standard item in every System/7 enclosure. This card is specifically designed to be sensitive to airborne contaminants. Inspection of this card gives an early warning so that appropriate action for protection of the system may be taken.

A Power Failure Detect feature (#5731) provides an early indication of imminent power failure so that the program can bring the system to an orderly halt. When power is restored, the auto restart function of the system can provide automatic program load from either the Operator Station or host teleprocessing link. The processor console switch must be appropriately set.

A thermal detector in the enclosure generates a warning interrupt if the internal temperature of the enclosure rises above a specified operating level. The thermal detector causes a power shutdown after the warning signal is generated. The time between the thermal interrupt and the power shutdown could be used by the program to cause an orderly halt of the operation.

PREREQUISITE: Models C3 and D6 require a Dx Enclosure Attachment (#3715) feature in models C3 and C6 enclosures.

Module Locations:

<table>
<thead>
<tr>
<th>Model Location Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>C3</td>
</tr>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

System/7 Summary: GA34-0002

Special: [1] Voltage (AC, 60 Hz): #9802 for 208, 1-phase (mdls A2, C3, D3 only).
#9803 for 380 V, 3-phase (mdls C3, C6, D6 only).
#9804 for 230 V, 1-phase (mdls A2, C3, D3 only).
#9805 for 230 V, 3-phase (mdls C3, C6, D6 only).

NOTE: While options are available, use of 3-phase power is recommended. This would eliminate the need for rewiring for system expansion to models C6 or D6.

[2] Power: Specify one of #9490 for 5010 A and B models ... #9481 for 5010 E models.

[3] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[4] Storage Power Addition (#7401) required for systems with more than 8K of storage (2010 A and B models only) ... see “Special Features.”

[5] Proposal of all 5026 Enclosures must be in accordance with procedures outlined at the end of this section.

[6] Kickstrip #9431, if needed. When kickstrip is installed, the open area underneath the machine is enclosed. This may be inconvenient for the operator or for signal wiring. Use of kickstrip is recommended only when the physical appearance of the system is of prime importance.

[7] Cables: For System/7 external cables for 5026 mdls D3 and D6, supplied by IBM, use cable order form number Z120-2368.

PRICES: Mdl MAC/ MRC Purchase MMMC

<table>
<thead>
<tr>
<th>Model</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>5026</td>
<td>A2</td>
<td>128</td>
<td>3,010</td>
</tr>
<tr>
<td></td>
<td>C3</td>
<td>296</td>
<td>6,510</td>
</tr>
<tr>
<td></td>
<td>C6</td>
<td>441</td>
<td>9,190</td>
</tr>
<tr>
<td></td>
<td>D3</td>
<td>296</td>
<td>6,510</td>
</tr>
<tr>
<td></td>
<td>D6</td>
<td>441</td>
<td>9,190</td>
</tr>
</tbody>
</table>

Plan Offering: Plan B Warranty: B Maintenance: B

Per Call: 2

Model Changes: Changes from C3 to C6 and from D3 to D6 are field installable. No other model changes can be made.

MODEL UPGRADE PURCHASE PRICES (There are no additional installation charges)

From Model C3 to Model C6 ... $4,200
From Model D3 to Model D6 ... $4,200

SPECIAL FEATURES

Dx ENCLOSURE ATTACHMENT (#3715), (mdls C3 and C6 only)
This feature provides for the connection of the Enclosure models D3 or D6 to Enclosure models C3 or C6. Maximum: One #3715 per system. Field Installation: Yes.

INTERNAL AIR ISOLATION 3 (#4621), (not with 5998-TO 1)
This feature provides for an air-to-air heat exchanger for dissipation of the internal heat. An activated carbon filtration system filters the internal air. The feature isolates the inside air from the outside and is used in severe industrial environments where gaseous contaminants harmful to electronic circuitry exist. Limitations: Proposals are not to recommend the IAI feature unless the FE Installation Planning Representative has determined that the feature is required, or the internal system detector indicates measures are necessary to protect an installed system. Maximum: One per C3 or D3 enclosure. Field Installation: Yes.

INTERNAL AIR ISOLATION 6 (#4622), (not with 5998-TO 1)
This feature is identical to #4621 and is provided for model C6 or D6 enclosures. Maximum: One per C6 or D6 enclosure. Field Installation: Yes.

POWER FAILURE DETECT (#5731), Provides a signal to the system when the input AC voltage falls below a safe level. This signal is used by the program to bring the system to an orderly halt. This feature also provides auto restart which can automatically restart system power when input AC power is restored. Maximum: One per enclosure. Field Installation: Yes.

STORAGE POWER ADDITION (#7401), (mdls A2, C3 and C6 only)
Provides a power supply for the 5010 Processor models A and B only, with storage in excess of 8K words. Maximum: One per system. Field Installation: Yes.

MAC/ MRC Purchase MMMC

<table>
<thead>
<tr>
<th>Special Feature Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dx Enclosure Attachment</td>
</tr>
<tr>
<td>Internal Air Isolation 3</td>
</tr>
<tr>
<td>Internal Air Isolation 6</td>
</tr>
<tr>
<td>Power Failure Detect</td>
</tr>
<tr>
<td>Storage Power Addition</td>
</tr>
</tbody>
</table>

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5028 OPERATOR STATION

Purpose: To provide an operator and computer input/output device for System/7.

Highlights: The 5028 Operator Station provides a keyboard, printer, paper tape punch, and paper tape reader. It is attached via a multi-wire cable to a System/7 Processor Module. The printer, paper tape reader, and paper tape punch operate at a speed of 10 characters per second. Transmission code is 7 level ASCII, with the 8th level for "even parity." The paper tape reader and punch can also read and punch 8-bit binary code without parity. The recording tape is one inch wide and may be paper (Part No.s 304469 or 426362), or lubricated, non-metallic plastic. A printing line is 72 characters with 6 lines per inch. Only single part paper may be used for printing.

LOCAL REMOTE switches provide for offline and online operations. The 5028 is used for program loading, data input/output, and paper tape preparation.

The 5028 Operator Station must be available for system maintenance in all configurations. An Operator Station may be shared among several System/7s, except those with 5998-TO 1. The customer must attach the Operator Station to the system requiring maintenance prior to the arrival of a customer engineer. Delays due to the relocation of an Operator Station from one system to another may result in extended down time. Before ordering a system without an Operator Station, the customer must realize the above condition as well as the procedure for disconnecting an Operator Station which requires these steps: stop system; power off Operator Station; disconnect Operator Station; start system.

PREREQUISITE: 5010 Processor Module.

System/7 Summary: GA34-0002

Input Power: 115 V AC, 1-phase, 60 Hz.

Specify: Cables. Use cable order form Z120-2368.

Supplies: A black ribbon, IBM Part No. 1136260 or equivalent, is required.

---

<table>
<thead>
<tr>
<th>PRICES:</th>
<th>Mdl</th>
<th>MAC/</th>
<th>MRC</th>
<th>2 yr</th>
<th>Purchase</th>
<th>MMC</th>
<th>MAC/</th>
<th>MLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>5028</td>
<td>1</td>
<td>$179</td>
<td>$152</td>
<td></td>
<td>$1,940</td>
<td>$69.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Plan Offering: Plan B  Warranty: B  Maintenance: C
Purchase Option: 50% Useful Life Category: 2  Per Call: 2
Termination Charge Months: 5  Termination Charge Percent: 25%  Upper Limit Percent: 0%
Purpose: 5029 mdl 1 is an accessory control number used for ordering components and Termination Cards for connection of customer signal wires to the System/7 interface. 5029 is not a machine in itself. Specify 5029 in the machine field only once per system for all Termination Cards and components. Features on 5029 cannot be ordered. Accessories in the 5029 are for purchasing and no maintenance service is available. Normal parts warranty of 3 months applies to the accessories.

Highlights: 5029 Attachment Accessories provide a number of cards and components used for connection of customer signals to the System/7 interface as conditioning and filtering of standard circuits are offered for each type of sensor I/O point. Special circuits can be constructed by the customer on the Custom Cards. Termination Cards provides a screw-down terminal for connection of customer wires. This feature offers several advantages, such as (a) the customer can wire his signals to the cards prior to system arrival at the site, thereby reducing the installation time ... (b) when a system is upgraded, rewiring is merely a matter of unplugging the cards from the old module and plugging them into the new module ... (c) sensor-based points may be quickly disconnected for troubleshooting.

System/7 Summary: GA34-0002.

ACCESSORIES

Table 1, below, shows a summary of the requirements for the Attachment Accessories.

AI CUSTOM (#1110). This card contains screw terminals for customer connection of four analog input signals to Multiplier/MS4 (#5248 in 5014), Multiplier/MR16 (#5247 in 5014), Multiplier/MR4 (#5246 in 5012), Multiplier/MS16 (#5249 in 5014), or Multiplier/MS4 (#5248 in 5012). Solder terminals are provided for the customer addition of networks to each point to complete the connection. This card should be used where the customer desires to construct analog input networks of his own design. Limitations: Use of this card can affect accuracy and repeatability of the analog to digital conversion of analog signals connected to it.

AI/MR FILTER (#1113). This card contains filter circuits and screw terminals for customer connection of four analog input signals to Multiplier/MS16 (#5247 in 5014), Multiplier/MR16 (#5247 in 5014), or Multiplier/MR4 (#5246 in 5012). Current resistors can be added to the terminals. No provision is made to add other components.

AI/MR RBT/FILTER (#1114). This card contains one resistance bulb thermistor circuit plus three filter circuits for customer connection of three analog input signals to Multiplier/MS16 (#5249 in 5014), Multiplier/MR16 (#5247 in 5014), or Multiplier/MR4 (#5246 in 5012). The resistance bulb thermistor circuit output can be used to calculate a reference junction temperature. The filter circuit is a non-polarized network ... can accept both positive and negative signals. Current resistors can be added to the terminals. No provision is made to add other components. Maximum: 32 per Temperature Reference Attach. Prerequisite: Temperature Reference Attach.

AI/MR NON-POLARIZED FILTER (#1121). This card contains one resistance bulb thermistor circuit plus three filter circuits for customer connection of three analog input signals to Multiplier/MS16 (#5249 in 5014) or Multiplier/MS4 (#5248 in 5012). The resistance bulb thermistor circuit output can be used to calculate a reference junction temperature. This feature offers several advantages, such as (a) the customer can wire his signals to the cards prior to system arrival at the site, thereby reducing the installation time ... (b) when a system is upgraded, rewiring is merely a matter of unplugging the cards from the old module and plugging them into the new module ... (c) sensor-based points may be quickly disconnected for troubleshooting.

AI/MR RBT/NON-POLARIZED FILTER (#1123). This card contains one resistance bulb thermistor circuit plus three filter circuits for customer connection of three analog input signals to Multiplier/MS16 (#5249 in 5014) or Multiplier/MS4 (#5248 in 5012). The resistance bulb thermistor circuit output can be used to calculate a reference junction temperature. The filter circuit is a non-polarized network ... can accept both positive and negative signals. Current resistors can be added to the terminals. No provision is made to add other components. Maximum: 32 per Temperature Reference Attach. Prerequisite: Temperature Reference Attach.

CAPACITOR NON-POLARIZED 10UF (#1570). A special capacitor used to construct the network on the AI/MS Non-Polarized Filter (#1121) termination card. This 10 microfarad, 35 volt, non-polarized capacitor has very low di-electric absorption, low leakage and small physical size.

CONNECTOR, 3-PIN (#1240). This cable plug is used to connect the customer analog output signal wires to the analog output points on the 5012. One is required for each Analog Output Point (#1246 in 5013). Installation of wires on the connector is the customer’s responsibility.

CONNECTOR, 4-PIN (#1815). This plug is used to connect the 2790 loop transmission lines to the 2790 Control (#1819) in the 5012. One is required for each 5014 and one for each 5012 with Analog Input Control Mod B (#1232) or Analog Input Control Mod C (#1233). Installation of wires on the connector is the customer’s responsibility.

CURRENT RESISTOR 4-20 MA (#1670). This precision resistor can be connected across analog input terminals to act as a current shunt. It converts 4 to 20 milliamperes to 128 to 640 millivolts. Limitation: Cannot be used on analog input termination cards AI/MR RBT/Filer (#1114) or AI/MS RBT/NON-Polarized Filter (#1123).

CURRENT RESISTOR 10-50 MA (#1671). This precision resistor can be connected across analog input terminals to act as a current shunt. It converts 10 to 50 milliamperes to 128 to 640 millivolts. Limitation: Cannot be used on analog input termination cards AI/MR RBT/Filer (#1114) or AI/MS RBT/NON-Polarized Filter (#1123).

DI CONTACT SENSE (#3281). This card contains contact sensing circuits and screw terminals for connection of eight digital input signals to Digital Input Group (#3289 in 5012 and 5013) or Process Interrupt (#3710 in 5012 or 5013). One side of each contact sense point is connected to a common 48 volt DC to provide contact sensing capability. No provision is made to add components.

DI CONTACT SENSE NON-ISOLATED (#3280). This card contains contact sensing circuits and screw terminals for customer connection of eight digital input signals to Digital Input Group (#3289 in 5012 or 5013), Digital Input Non-Isolated (#3292) in 5012 or 5013). One side of each contact sense point is connected to a common 48 volt DC to provide contact sensing capability. No provision is made to add components.

DI CUSTOM (#3282). This card contains screw terminals for customer connection of eight digital input signals to Digital Input Group (#3289 in 5012 or 5013), Digital Input Non-Isolated (#3292) in 5012 or 5013) or Process Interrupt (#3710 in 5012 or 5013). Solder terminals are provided for customer addition of networks to each point to complete the connection. This card should be used where the customer desires to use digital input networks of his own design.

DI VOLTAGE SENSE (#3283). This card contains circuits and screw terminals for customer connection of eight digital input signals to Digital Input Group (#3289 in 5012 or 5013), Digital Input Non-Isolated (#3292) in 5012 or 5013) or Process Interrupt (#3710 in 5012 or 5013). No provision is made to add components on this card.

DO CONNECTOR (#3410). This card contains screw terminals for connection of eight digital output signals to DO Low Power Group (#3421 in 5012 or 5013), DO Medium Power Group (#3422 in 5012 or 5013), DO Medium Power Non-Isolated (#3424 in 5012 or 5013), or DO Contact Group (#3420 in 5012 or 5013). No provision is made to add components.

DO CUSTOM (#3430). This card contains screw terminals for customer connection of eight digital output signals to DO Low Power Group (#3421 in 5012 or 5013), DO Medium Power Group (#3422 in 5012 or 5013), DO Medium Power Non-Isolated (#3424 in 5012 or 5013), or DO Contact Group (#3420 in 5012 or 5013). Solder terminals are provided for the customer addition of networks to each point.

VOLTAGE CHECK (#1194). This card provides seven voltage outputs of either polarity suitable for use as an analog input checking source. The card can be plugged into a specific socket and wired to one analog input point at a time to be used as a program addressable voltage check source. The following voltage are provided: 4 volts, 512 millivolts, 128 millivolts, 64 millivolts, 32 millivolts, 15 millivolts, and 5 millivolts.
### Accessories Prices: Feature Purchase

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>AI Custom</td>
<td>$30.00</td>
</tr>
<tr>
<td>AI/MR Filter</td>
<td>1113</td>
</tr>
<tr>
<td>AI/MR RBT/Filter</td>
<td>1114</td>
</tr>
<tr>
<td>AI/MS Connector</td>
<td>1122</td>
</tr>
<tr>
<td>AI/MS Non-Polarized Filter</td>
<td>1121</td>
</tr>
<tr>
<td>AI/MS Polarized Filter</td>
<td>1124</td>
</tr>
<tr>
<td>AI/MR RBT/Non-Polarized Filter</td>
<td>1123</td>
</tr>
<tr>
<td>Capacitor Non-Polarized 10UF</td>
<td>1570</td>
</tr>
<tr>
<td>Connector, 3-Pin</td>
<td>1240</td>
</tr>
<tr>
<td>Connector, 4-Pin</td>
<td>8185</td>
</tr>
<tr>
<td>Current Resistor 4-20 MA</td>
<td>1670</td>
</tr>
<tr>
<td>Current Resistor 10-50 MA</td>
<td>1671</td>
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<tr>
<td>DI Contact Sense</td>
<td>3281</td>
</tr>
<tr>
<td>DI Custom</td>
<td>3282</td>
</tr>
<tr>
<td>DI Voltage Sense</td>
<td>3283</td>
</tr>
<tr>
<td>DO Connector</td>
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</tr>
<tr>
<td>DO Custom</td>
<td>3430</td>
</tr>
<tr>
<td>Voltage Check Card</td>
<td>1184</td>
</tr>
</tbody>
</table>

**Note:** Specifications stated in the sales manual are a generalized description of the system features. Detail specifications for System/7 Sensor I/O features must be quoted or proposed from the latest revision of the IBM System/7 Installation Manual - Physical Planning, GA34-0004.

---

### TABLE 1

**Analog Input (AI) — System/7 Attributes for System/7**

<table>
<thead>
<tr>
<th>Components</th>
<th>2790 Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Input (AI)</td>
<td>External Sync</td>
</tr>
<tr>
<td>AI/MR Filter (#1113)</td>
<td>1</td>
</tr>
<tr>
<td>AI Custom (#1110)</td>
<td>1</td>
</tr>
<tr>
<td>AI/MS Connector (#1123)</td>
<td>1</td>
</tr>
<tr>
<td>AI/MS Non-Polarized Filter (#1121)</td>
<td>1</td>
</tr>
<tr>
<td>AI/MS Polarized (#1124)</td>
<td>1</td>
</tr>
<tr>
<td>AI/MR RBT/Non-Polarized Filter (#1123)</td>
<td>1</td>
</tr>
<tr>
<td>AI Current Resistors</td>
<td>Total Maximum Cards per AI Group</td>
</tr>
<tr>
<td>Current Resistor 4-20 MA (#1670)</td>
<td>4</td>
</tr>
<tr>
<td>Current Resistor 10-50 MA (#1671)</td>
<td>4</td>
</tr>
<tr>
<td>Total Maximum Resistors per AI Group</td>
<td>4</td>
</tr>
<tr>
<td>DI Terminalization Cards</td>
<td>Di Contact Sense (#3280)</td>
</tr>
<tr>
<td>Di Contact Sense Non-Isolated (#3280)</td>
<td>2</td>
</tr>
<tr>
<td>Di Voltage Sense (#3283)</td>
<td>2</td>
</tr>
<tr>
<td>Di Custom (#3283)</td>
<td>2</td>
</tr>
<tr>
<td>Total Maximum Cards per DI Group</td>
<td>2</td>
</tr>
<tr>
<td>DO Terminalization Cards</td>
<td>DO Connector (#3410)</td>
</tr>
<tr>
<td>DO Custom (#3430)</td>
<td>2</td>
</tr>
<tr>
<td>Total Maximum Cards per DO Group</td>
<td>2</td>
</tr>
<tr>
<td>Connectors</td>
<td>1 per I/O Module</td>
</tr>
<tr>
<td>Connector, 3 Pin (#1240)</td>
<td>1 per Point</td>
</tr>
<tr>
<td>Connector, 4 Pin (#8185)</td>
<td>1 per Loop</td>
</tr>
</tbody>
</table>

---

**TABLE 1 (cont'd)**

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Purpose: The 5203 Printer mdl 3 is used for printed output for a S/370 mdl 115. For description and use of the 5203 mdls 1, 2 and 3 with S/3, see GSD manual.

Model 3 300 lpm rated speed with a 48 character set.

Model Changes: Field Installable.

Highlights: The standard unit has 96 print positions ... can be expanded to 120 or 132 positions. See “Special Features.” Vertical spacing is 6 or 8 lines/inch, under operator control. Horizontal spacing is 10 characters to the inch.

One interchangeable train cartridge is supplied with the 5203 mdl 3 ... see “Specify.” Additional interchangeable train cartridges are available ... see “Special Features.”

When Universal Character Set Control (#9848) is installed on the 3115, and the 5203 is equipped with Universal Character Set Attachment (#8639), interchangeable train cartridges containing character sets from 49 to 120 characters can be used. Use of such character sets may result in reduced throughput, depending upon the character set being used and the text being printed. See 5203 Printer in “Type Catalog” for details.

Printed format is controlled by the stored program. Continuous marginally punched forms are fed by a forms tractor. Maximum forms dimensions are 16-3/4" wide and 14" long (edge-to-edge). Minimum forms dimensions are 3-7/8" wide and 3" long (edge-to-edge). Paper eject speed is 16.67 /second at 6 lines/inch ... 12 /second at 8 lines/inch.

Limitations: [1] Only marginally punched, pin fed, continuous forms can be used on the 5203. No staples are permitted in the print train area.

[2] No representations or commitments as to readability of 5203 printing by optical character recognition equipment shall be made.

[3] Print quality and forms feeding varies with paper specifications, ribbon and number of copies. Multiple copy forms of more than four parts and forms with a first part heavier than 13-pounds should be tested under operating conditions to determine that results are satisfactory for the user’s application.

[4] Forms sets which gave satisfactory results on 5203 mdls 1 and 2 may show a decrease in print quality when used on a 5203 mdl 3.

[5] For S/370 mdl 115, the 5203 Printer mdl 3 requires 120 print positions if this is the only printer on the system.

Maximum: Only one 5203 mdl 3 can be attached to a S/370 mdl 115.

Supplies: ribbons

Prerequisites: For S/370 mdl 115 -- an Integrated 3203/5203 Printer Prerequisite (#4653) and Integrated 5203 Printer Mdl 3 Attachment (#4690) on the 3115.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 60 Hz): #9003 for 208 V or #9905 for 230 V. Must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9046 for white.

[3] Print Train Arrangement: See 5203 Printer in “Type Catalog” for arrangements and required feature #s.


PRICES: Mdl MAC/ MRC Purchase MMMC
5203       3 $ 488 $10,880 $158

Plan Offering: Plan A, Additional Use Charge Rate: 10%
Metering: I/O Unit (Online) Warranty: B Maintenance; C Purchase Option: 40% Useful Life Category: 2 Per Call: 2

SPECIAL FEATURES

INTERCHANGEABLE TRAIN CARTRIDGE, ADD'L (#4740). An additional operator changeable train cartridge containing from 48 to 120 different characters. See “Type Catalog” for feature numbers of available arrangements. Prerequisites: If any character set containing more than 48 different characters is to be used, Universal Character Set Attachment (#8639) is required on the 5203. In addition, Universal Charater Set Control (#9848) is required on the 3115 Processing Unit.

PRINT POSITIONS, 24 ADDITIONAL (#5558). Increases the number of print positions from 96 to 120.

PRINT POSITIONS, 12 ADDITIONAL (#5559). [For field installation only ... for plant installation of 132 print positions, order #5560 below] Increases the number of print positions from 120 to 132. Prerequisite: Print Positions, 24 Add'l (#5558) on the 5203.

PRINT POSITIONS, 36 ADDITIONAL (#5560). Increases the number of print positions from 96 to 132.

UNIVERSAL CHARACTER SET ATTACHMENT (#8639). Required if any Interchangeable Train Cartridge with more than 48 different characters is to be used. See 5203 Printer in “Type Catalog” for details. Prerequisite: Universal Character Set Control (#9848) on the 3115.

Special Feature Prices: MAC/ MRC Purchase MMMC FIC
Interchangeable Train Cartridge, Add'l #4740 $123 $2,145 $40.50 **
Print Positions, 24 Add'l 5558 59 1,180 2.50 $205
Print Positions, 12 Add'l 5559 19 587 2.50 NC 189
Print Positions, 36 Add'l 5560 88 1,750 2.50 205
Universal Char Set Attach 8639 10 236 1.50 162

** Installation by IBM is not normally required. However, if assistance is required, charges will be made on a Time and Material basis.
**IBM 5213 PRINTER**

**Purpose:** Optional console printer for the S/370mdl 115 (5213 mdl 1 only) or S/370 mdl 125 (5213 mdl 1 only).

For description and use of the 5213 mdl 1, 2 or 3 with the number of mdl 1 only) or (LPM) can be approximated using formulas:

- Continuous forms and above (mdl 1) -- a black ribbon, 13-7/8" wide (hole-to-hole), provides single space forms indexing under program control, and has high speed tab left. Up to 6-part forms can be printed, with a maximum thickness of .018" (for optimum feeding and stacking, no more than 3 parts are recommended). Forms length can be 3" to 14" in increments of 1/6". Card stock continuous forms are not recommended. An optional forms stand stacker is available ...

- Use of the "underscore" in conjunction with another character will overprint the lowest matrix dot forming that character and is not recommended. Refer to SRL GAZ4-3488 for form design considerations and limitations.

**Model 1** -- a pin feed platen, which feeds marginally punched continuous forms 13-7/8" wide (hole-to-hole), provides single space forms indexing under program control, and has high speed tab left. Up to 6-part forms can be printed, with a maximum thickness of .018" (for optimum feeding and stacking, no more than 3 parts are recommended). Forms length can be 3" to 14" in increments of 1/6". Card stock continuous forms are not recommended. An optional forms stand stacker is available ...

**Performance Considerations** -- an analysis of each document type to be printed is necessary to find actual throughput of a serial printer. When used with dedicated printing jobs, throughput depends upon the ratio (R) of lines printed per page to the maximum number of lines available per page and upon the number of character positions (C) in the printed line. Lines printed per minute (LPM) can be calculated using formulas:

For Model 1: \[ \text{LPM} = \frac{2700}{R} \]

**EXAMPLE:** For Model 1: 100 lines on a page are printed, \( R = 1 \). Assume a maximum length of 75 character positions.

Then: \[ \text{LPM} = \frac{2700}{100} = 27 \text{ (approximate throughput)} \]

**Prerequisites:** An integrated 5213 Printer mdl 1 Attachment (4692) on the 3115 or 3125 Processing Unit.

**Limitations:** Only one printer can be attached to a 3115 or 3125 Processing Unit.

**Supplies:** Serial #12000 and below (mdl 1) -- a black ribbon, IBM Part No. 1136906 or equivalent, is recommended. Serial #12001 and above (mdl 1) -- a black ribbon, IBM Part No. 1136970 or equivalent, is recommended

**Bibliography:** GC20-8090

**Specify:** Voltage (AC 1-phase, 3-wire, 60 Hz): \#9902 for 208 V, or \#9904 for 230 V must be consistent with system voltage.

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MRC/PRCH</th>
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<tbody>
<tr>
<td>5213</td>
<td>1</td>
<td>S 179</td>
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Plan Offering: Plan A, Additional Use Charge Rate: 10% Metering: Base Unit (meter on 3115 or 3125) Maintenance: B Purchase Option: 40% Useful Life Category: 2 Per Call: 2 Warranty: B

**Accessories:** The following item is available on a purchase only basis. For shipment with machine, order the Feature # indicated below at the price listed in M 10000 pages. See M 10000 for additional information and field installation.

**FORMS STAND STACKER** (4450). (mdl 1 only) Permits placement of continuous forms (out of carton) on the stand above floor level and provides for continuous forms stacking after printing.

---

**IBM 5424 MULTI-FUNCTION CARD UNIT**

**Purpose:** A multi-function card input/output unit for attachment to a 4331 Processor. Uses the 96-column card.

**Model**
- Speed (Read/Punch/Print)
  - A1: 250/60/60 * cpm
  - A2: 500/120/120 * cpm

  \* Print Speed: Is at the maximum rate of 60 or 120 cards per minute on any or all of the first three lines. Printing on the fourth (lower) line will cause reduction in throughput regardless of whether or not printing occurs on any or all of the first three lines. Resultant throughput is 48 cpm for a model A1 and 96 cpm for a model A2.

**Highlights:** Provides the combined functions of a card reader, punch, collator and interpreter in one unit. Permits collating, gangpunching, reproducing, summary punching, punching of calculated results, printing, and classifying of cards in a single pass of the cards. Card sorting is also possible using a multiple pass method under program control.

**Input Section:** Separate primary and secondary card hoppers, each with a 2,000 card capacity, feed cards independently to a common read station and on into separate wait stations. Depending upon the model, rated serial reading is at 250 or 500 cards per minute from either hopper. The common reading unit is checked for proper functioning on each read cycle. The card code read is 6 rows consisting of A, B, 8, 4, 2, 1 punches representing a 64-character set.

**Output Section:** From separate wait stations, cards are fed to a common punch station, through the punch and cornering stations to the print station, where up to 4 lines with up to 32 characters per line can be printed on the card. Line designation is determined by the stored program. Characters represented are the standard 64 character set corresponding to the 96-column card code. Printing is by engraved typewheel. Cards are then selected into any of the 4 stackers, each with a 600-card capacity. Depending upon the model, rated serial punching is at 60 or 120 cards/minute.

**Multi-function:** With the ability to move cards from either hopper under independent control to the punching station and with complete stacker selection flexibility, the common card functions of collating, reproducing, gangpunching, summary punching, and selective stacking can be accomplished.

**Maximum:** One 5424 mdl A1 or A2 can be attached to an 4331 Processor.

**Prerequisites:** A 5424 Attachment (#3901) on the 4331 ... 4331 Attachment (#6510) on the 5424 itself. See "Special Features" below.

**Limitations:**
1. Detailed disclosure specifications describing the 96-column card are available from the IBM Corp., Commercial Development Office, Armonk, New York. Card configurations or card stocks which do not conform to these specifications may result in unsatisfactory machine performance. The configurations available from IBM

2. OCR type font for use with current line IBM Optical Character Reading Equipment is not available.

**Supplies:** The 5424 uses a cassette ribbon replaceable by the customer.


**SPECIFY**

- Voltage (AC 1-phase, 3-wire, 60 Hz): \#9902 for 208 V, or \#9904 for 230 V must be consistent with system voltage.
- Color: \#9098 for pearl white must be specified.

**PRICES:**

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<td></td>
<td>A2</td>
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Plan Offering: Plan A, Additional Use Charge Rate: 10%

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<tr>
<td>Purchase Option: 35%</td>
<td>Useful Life Category: 2</td>
</tr>
</tbody>
</table>

**Model Changes:** Field installable.

† No Educational Allowance.

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IBM 5425 MULTI-FUNCTION CARD UNIT

Purpose: A multi-function card input/output unit for a 5/370 mdl 115, 125 ... uses the 96-column card.

Model Speed (Read/Punch/Print)
- A1: 250/60/60* cpm
- A2: 500/120/120* cpm

Model Changes: Field installable.

Highlights: Provides the combined functions of a card reader, punch, collator and interpreter in one unit. Permits collating, gang-punching, reproducing, summary punching, punching of calculated results, printing, and classifying of cards in a single pass of the cards. Card sorting is also possible using a multiple pass method under program control.

Input Section -- separate primary and secondary card hoppers, each with a 2000-card capacity, feed cards independently to a common read station and on into separate wait stations. Depending upon the model, rated serial reading is at 250 or 500 cards/minute from either hopper. The common reading unit is checked for proper functioning on each read cycle. The card code read on both models is 8 rows of D, C, B, A, 8, 4, 2, 1 punches representing a 256-character set.

Output Section -- from separate wait stations, cards are fed to a common punch station, through the punch and cornering stations, to the print station, where up to 4 lines with up to 32 characters per line can be printed on the card. Line designation is determined by the stored program. Characters represented are the standard 64-character set corresponding to the 6-bit subset of the 96-column card code. Printing is by engraved typewheel. Cards are then selected into anyone of 4 stackers, each with a 600-card capacity. Depending upon the model, rated serial punching is at 60 or 120 cards/minute.

Note: Punching is eight rows representing a 256-character set. Eight-row punching in columns 33-96 can overpunch print positions 65-128.

Multi-function -- with the ability to move cards from either hopper under independent control to the punching stations and with complete stacker selection flexibility, the common card functions of collating, reproducing, gang-punching, summary punching, and selective stacking can be accomplished.

* Print Speed -- is at the maximum rate of 60 or 120 cards/minute when printing on any or all of the first three lines. Printing on the fourth (lower) line will cause some reduction in throughput regardless of whether or not printing occurs on any or all of the first three lines. Resultant throughput is 48 cpm for mdl A1 and 96 cpm for mdl A2. Uses a cassette ribbon replaceable by the customer.

Maximum: One 5425 mdl A1 or A2 can be attached to a 5/370 mdl 115 or 125.

Prerequisites: An Integrated 5425 Attachment (#4695) with #9183 specified for mdl A1 or #9184 for mdl A2 on the 3115 or 3125.

Limitations: [1] Detailed disclosure specifications describing the 96-column card are available from the IBM Corp., Commercial Development Office, Armonk, New York. Card configurations or card stocks which do not conform to these specifications may result in unsatisfactory machine performance. The configurations available from IBM

[2] OCR type font for use with current line IBM optical character reading equipment is not available.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 3-phase, 60 Hz): #9903 for 208 V, or #9905 for 230 V ... must be consistent with system voltage.

[2] Color: #9041 for red, #9042 for yellow, #9043 for blue, #9045 for gray, or #9048 for white ... must be consistent with 3115 or 3125.

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**Purpose:** An operator oriented key entry unit used to create the 96-column card as well as verify data which has been previously recorded.

*For use with System/3, 3740 System or 5320, see GSD manual.*

**Model 1**
- Rated card read speed 20 columns per second.

**Model 2**
- Rated card read speed 60 columns per second. Minus right adjust standard.

When equipped with a 2772/3741/5320 Attachment (#7850), the model 1 can be attached to a 2770 Data Communication System for transmission and punching of 96 column card data or can be attached to a 3741 Data Station/Programmable Work Station as an auxiliary card reader.

When equipped with a 3735 Attachment (#7801), the model 1 can be attached to a 3735 Programmable Buffer Terminal for transmissions, reading, and punching of 96-column card data.

**Highlights:**
- Buffer, key entry, punch and print areas...
- 64-character keyboard...
- Auto skipping... automatically duplicating at electronic speeds...
- Four program levels...
- Right adjust, size of field can be 96 columns...
- Word erase... record erase...
- Upper, lower and numeric shift control...
- Punches and punches at 20 columns per tier per second, equivalent to 60 characters per second...
- Engraved printing...
- Backlighted, easy-to-read column indicator...
- Hopper and stacker capacity of 350 cards...
- 410 square inch reading board work area...
- Rotational keyboard mobility...
- Auxiliar duplication is a standard operation...
- Feed check light indicates card misfeed or card jam...
- Stack... stacker full light.

Alphabetic, numeric and special character recording in cards can be key verified on the same machine.

Notches verified correct cards on trailing edge of card...
- Manually skipped columns verified as blanks...
- Programmmed or manually keyed auto verified fields will be verified...
- Programmed skipped fields will not be verified for content...
- Right adjust fields are programmable for testing proper number of blanks inserted...
- When an error is detected, keyboard locks and error light is lit...
- Depressing error reset unlocks keyboard...
- When in third try on column in error, memory is changed to reflect corrected data...
- At end of corrected field, control reverts to first manual column of corrected field for reverification...
- Completion of proper verify routine allows blank cards to be manually inserted in hopper and repunch operation provides a correct card with verify notch...
- Incorrect card will be stacked without notching...
- Correct field formatting will enhance throughput when verifying...

A cassette ribbon provides for rapid and easy operator installation.

A card gauge is provided without additional charge with each Data Recorder.

**Limitation:** Detailed disclosure specifications describing the 96-column card are available from the IBM Corp., Commercial Development Office, Armonk, New York. Card configurations or card stocks which do not conform to these specifications may result in unsatisfactory machine performance. The configurations available from IBM manual:

**Specify:**
- [1] Voltage (115 V AC, 1-phase, 60 Hz, non-lock plug): 
  - #9861
- [2] When ordered as a component of a 2770 system, 2772/3741/5320 Attachment (#7850) is required...
  - See "Special Features."
- [3] When ordered for attachment to a 3735 Programmable Buffered Terminal, 3735 Attachment (#7801) is required...
  - See "Special Features."
- [4] When ordered for attachment to a 3741 Data Station/Programmable Work Station, 2772/3741/5320 Attachment (#7850) is required...
  - See "Special Features."
- [5] Print Wheel Arrangement: Slash-zero is the standard numeric character. If a non-slash zero (0) is desired, specify #9490. See Type Catalog TC 1 for field installation charge.

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**SPECIAL FEATURES**

**8-BIT READ/PUNCH (#3666).**
- [Model 1 only] Provides offline capability to punch special 8-bit coded characters in 96-column cards. Dependent on C/D-Bit switch setting, 5496 operates in either conventional System/3 6-bit mode or Special 8-bit mode. C/D switch ON permits 96-column cards punched with 256-character set to be read into storage for subsequent punchout (duplication) or manual keyboard entry of combined bit structures to generate special 8-bit coded characters. Keyboard generated characters utilize the multi-punch key method. 8-bit characters are not printable regardless of print switch setting.

In verify, the 8-bit mode of operation is inhibited regardless of the C/D-Bit switch setting, thereby preventing the verification of 8-bit coded characters.

**Limitation:** Cannot be installed on machines equipped with System/3 Model 6 Attachment (#7501), 3735 Attachment (#7801), or 2772/3741/5320 Attachment (#7850). Field Installation: Not recommended for use with System/3 Model 6 Attachment.

**SELF-CHECKING NUMBER (#7061, 7062).**
- Provides a means of verifying predecoded alphanumeric information at the same time it is punched. Use of the feature requires that a check digit be added to the basic code number to produce a self-check number. The check digit is always placed in the units position of a self-checking number. More than one self-checking field can be checked per card. Correctly keyed cards are identified by "B" bit punch in the space adjacent to column 32 of tier 1. Self-checked fields bypassed via skip key depression will not carry the "B" bit punch in the specified location. One of two versions of the feature can be installed:
  - #7061 = Modulus 10 factors...
  - #7062 = Modulus 11 factors...

In that order, and the arithmetic weighting factors used to arrive at the Modulus 10 check digit.

**Limitations:** Neither version will operate on a left-based number...

- Self-check numbers of Modulus 10 are not compatible with those of Modulus 11.

**SYSTEM/3 MODEL 6/5320 ATTACHMENT (#7501).**
- See GSD manual for details and prices.

**3735 ATTACHMENT (#7801).**
- [Model 1 only] To attach the 5496 to the 3735 Programmable Buffered Terminal. Operation is under switch control on the 5496. When in "Terminal" position, the 5496 may be used as either a card reader or a card punch for punching of 96-column card data at 20 columns per tier per second, or equivalent to 60 characters per second...

In that order, equivalent to 60 characters per second...

In that order, equivalent to 60 characters per second...

When in manual position, the 5496 operates as a standard machine.

**Limitation:** Cannot be installed on the 2772 or 3741. Note: A signal switch setting, thereby preventing the verification of 8-bit coded characters.

**Limitation:** Cannot be installed on machines equipped with System/3 Model 6 Attachment (#7501), 3735 Attachment (#7801), or 2772/3741/5320 Attachment (#7850). Field Installation: Not recommended for use with System/3 Model 6 Attachment.

**SELF-CHECKING NUMBER (#7061, 7062).**
- Provides a means of verifying predecoded alphanumeric information at the same time it is punched. Use of the feature requires that a check digit be added to the basic code number to produce a self-check number. The check digit is always placed in the units position of a self-checking number. More than one self-checking field can be checked per card. Correctly keyed cards are identified by "B" bit punch in the space adjacent to column 32 of tier 1. Self-checked fields bypassed via skip key depression will not carry the "B" bit punch in the specified location. One of two versions of the feature can be installed:
  - #7061 = Modulus 10 factors...
  - #7062 = Modulus 11 factors...

In that order, and the arithmetic weighting factors used to arrive at the Modulus 11 check digit.

**Limitations:** Neither version will operate on a left-based number...

- Self-check numbers of Modulus 10 are not compatible with those of Modulus 11.

**SYSTEM/3 MODEL 6/5320 ATTACHMENT (#7501).**
- See GSD manual for details and prices.

**3735 ATTACHMENT (#7801).**
- [Model 1 only] To attach the 5496 to the 3735 Programmable Buffered Terminal. Operation is under switch control on the 5496. When in "Terminal" position, the 5496 may be used as either a card reader or a card punch for punching of 96-column card data at 20 columns per tier per second, or equivalent to 60 characters per second...

In that order, equivalent to 60 characters per second...

In that order, equivalent to 60 characters per second...

When in manual position, the 5496 operates as a standard machine.

**Limitation:** Cannot be installed on the 2772 or 3741. Note: A signal switch setting, thereby preventing the verification of 8-bit coded characters.

**Limitation:** Cannot be installed on machines equipped with System/3 Model 6 Attachment (#7501), 3735 Attachment (#7801), or 2772/3741/5320 Attachment (#7850). Field Installation: Not recommended for use with System/3 Model 6 Attachment.

**SELF-CHECKING NUMBER (#7061, 7062).**
- Provides a means of verifying predecoded alphanumeric information at the same time it is punched. Use of the feature requires that a check digit be added to the basic code number to produce a self-check number. The check digit is always placed in the units position of a self-checking number. More than one self-checking field can be checked per card. Correctly keyed cards are identified by "B" bit punch in the space adjacent to column 32 of tier 1. Self-checked fields bypassed via skip key depression will not carry the "B" bit punch in the specified location. One of two versions of the feature can be installed:
  - #7061 = Modulus 10 factors...
  - #7062 = Modulus 11 factors...

In that order, and the arithmetic weighting factors used to arrive at the Modulus 11 check digit.

**Limitations:** Neither version will operate on a left-based number...

- Self-check numbers of Modulus 10 are not compatible with those of Modulus 11.

**SYSTEM/3 MODEL 6/5320 ATTACHMENT (#7501).**
- See GSD manual for details and prices.

**REFERENCES**
- IBM MAC/ Purchase

**PRICES**

<table>
<thead>
<tr>
<th>Model</th>
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<th>MAC/</th>
<th>Purchase</th>
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**Plan Offering:**
- Plan B
- Purchase Option: 40% Maintenance: C

**Warranty:**
- B
- Useful Life Category: 2
- Per Call: 1

**Model Changes:** Model 1, with serial number 51221 or above, can be field upgraded to a Model 2.
### Special Feature Prices

<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/ MRC</th>
<th>Purchase</th>
<th>MMMC</th>
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**SPECIAL FEATURE COMBINATIONS** — maximum combinations, indicated by "X", are shown in vertical columns.

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<td>Self-Checking Number Modulus 10 or 11 #7061/7062</td>
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<td>System/3 Model 6 Attachment #7501</td>
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<tr>
<td>1735 Attachment #7801</td>
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</tr>
<tr>
<td>2772/3741/5320 Attachment #7850</td>
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</tbody>
</table>

* Not recommended for field installation.

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7330 MAGNETIC TAPE UNIT

The following specifications can be changed in the field.

[1] Voltage (AC, 3-phase, 4-wire, 60 Hz): $9903$ for 208 V, or $9905$ for 230 V... must be consistent with system voltage.


7770 AUDIO RESPONSE UNIT

Purpose: Provides a composed audio response to a digital inquiry from a 1001 Data Transmission Terminal, a telephone set, or other inquiry type terminal to a field-oriented S/360 mdl 22, 25, 30, 40, 50, 65, 75, 85, 195 or any S/370 Processor, or any 4300 Processor.

Highlights: Connects a data processing system with telephone and other inquiry type terminals through common carrier data sets over appropriate communication services. The 7770 receives an input consisting of a series of coded characters from the inquiry terminal.

The inquiry message and the response message are transmitted between the 7770 and the processing unit character-by-character under program control. There is no limitation on the length of the inquiry or response message. Other major characteristics are:

- Conversational Mode Operation under program control -- inquiry-answer sequence may be repeated any number of times within the same call without re-dialing the 7770 for each inquiry.
- Primary Character Timeout Disconnect -- the 7770 answers an incoming call and waits 32 seconds for the first inquiry character to appear... if it does not appear within this time, the call is abandoned, releasing the line for other service.
- Inquiry characters are sent to the processor for translation and 99 codes are recognizable. For valid codes, see SRL GA27-2712.

Vocabulary -- a 32-word American English vocabulary is provided with the basic 7770. This can be expanded, in 16-word increments, to up to 128 words... see "Special Features." One word of the vocabulary must be silence. Words may be specified by the customer according to message requirements. However, lengthy words must be split and will count as two words. See SRL GA27-2712 for guidance in word selection. For field vocabulary modifications, a replacement rotor will be shipped from the plant.

Input/Output Lines -- the basic unit handles up to four lines. The number of lines can be expanded in 4-line increments to 48 lines... see "Special Features." Random inquiries on all input/output lines can be responded to simultaneously.

Configurations -- see the chart following "Special Features" for various combinations and number of input/output lines possible, and the special features required for them.

Communications -- the 7770 will operate with:

(a) 1001 Data Transmission Terminal
(b) Rotary dial telephone with associated push-button† manual dialing device for inquiry
(c) Rotary dial telephone with associated push-button† type card dialing device for inquiry
(d) Push-button† manual dial telephone‡
(e) Push-button† type card dial telephone‡†
(f) Rotary dial telephone‡
(g) Rotary dial card dialer telephone‡‡
(h) Rotary dial card curler telephone‡‡†

Communication Facilities -- operates in half-duplex mode over common carrier switched telephone network... common carrier leased private line switched telephone service..., privately owned communication networks of voice bandwidth. When operating over a switched telephone network, telephone lines should be ordered for receive-only service, with make-busy capability in the data set.

Customer Responsibilities -- the customer must be advised that:

[1] He is responsible for price quotations, installation and cost (including and receipt of) of common carrier equipment and services.
[2] Toll charges, if required for installation and maintenance of

the 7770, are to be paid by the customer... [3] DP Marketing Representative must have customer obtain firm installation date for transmission service before processing the OCC card... [4] 7770 Vocabulary Specification Sheet must be completed and submitted at least 90 days prior to installation.

Programming Support -- programming systems support is covered under DOS and OS TCAM... see "Programming." 

Prerequisites: A control unit position on a system multiplexer channel... one subchannel per input/output line.

S/360 mdl 25 -- Multiplexer Channel (#5248) see 2025.
S/360 mdl 22, 30, 40, 50 -- multiplexer channel (standard) see 2022, 2030, 2040, 2050.
S/360 mdl 65, 75, 85, 195, or S/370 mdl 165, 168, 195 -- basic multiplexer channel of 2870... see 2870.
S/370 mdl 115, 125 -- Multiplexer Channel (special feature) see 3115, 3125.
S/370 mdl 155, 158 -- multiplexer channel (standard), 2nd Byte Multiplexer Channel (special feature) see 3155, 3158.
3031, 3032 Processor -- byte multiplexer channel (one is standard) see 3031, 3032.
3033 Processor -- byte multiplexer channel (two are standard) see 3033.
4331 Processor -- byte multiplexer channel (special feature) see 4331.
4341 Processor -- byte multiplexer channel (standard) see 4341.

Bibliography: GC20-0001

Specify: [1] Voltage (AC, 1-phase, 3-wire, 60 Hz): $9902$ for 208 V, or $9904$ for 230 V... must be consistent with system voltage.


[3] Vocabulary Words: Submit completed Vocabulary Specification Sheet at least 90 days prior to installation... see "Special Features."

PHRASES: Mdl MRC Purchase MMMC

| 7770 | 3 | $1,295 | $48,370 | $52.50 |
| Plan Offering: Plan A, Additional Use Charge Rate: 30% Metering: Assignable Unit Warranty: B Maintenance: B Purchase Option: 55% Per Call: 3

SPECIAL FEATURES

EOI DISABLE (#3540). Allows EOI character of some push-button† dialer devices to be used as a data character instead of an EOI character. Maximum: One.

I/O LINE FRAME (#4668). Required if more than sixteen input/output lines are to be attached. Maximum: One.

I/O LINE EXPANDED (#4677). Provides for additional input/output lines. Maximum: Eleven.

I/O LINE PANEL (#4679). An additional panel for eight input/output lines or portion thereof. One is required for each increment of eight lines, or portion thereof, added beyond the first eight lines. Maximum: Five.

ISOLATION, CONTROL UNIT (#4700). [For field installation on units shipped prior to December 29, 1967... standard on units shipped after that.] To turn power on or off on the 7770 without generating spurious signals. Thus a CPU, if it can be logically disconnected from the system before power is turned off, can continue operating. Prerequisite: in all cases there are compatible EC level requirements.

† For example: TOUCH-TONE, trademark of Bell System, or Touch-Calling, term used by General Telephone System.
‡ Limited to areas served by telephone company central offices for push-button dialing.
‡‡ This is a standard telephone company offering. If technically feasible for local conditions, it may be offered on a special assembly basis at discretion of a local telephone company using a telephone dictation trunk device suitably modified for this purpose.

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VOCABULARY WORDS, ADD'L (#8721). Each adds 16 vocabulary words. See SRL GA27-2712 for vocabulary word selection. When ordered for field installation, a replacement rotor is shipped from the plant. Maximum: Six #8721s, for a maximum of 128 words on a 7770.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>MAC/</th>
<th>MRC</th>
<th>Purchase</th>
<th>MMMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>EOI Disable</td>
<td>#3540</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
<td>$11</td>
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<tr>
<td>I/O Line Frame</td>
<td>4668</td>
<td>$217</td>
<td>$8,065</td>
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<tr>
<td>I/O Line Expanded</td>
<td>4677</td>
<td>190</td>
<td>7,065</td>
<td>16.50</td>
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<tr>
<td>I/O Line Panel</td>
<td>4679</td>
<td>81</td>
<td>3,020</td>
<td>2.50</td>
<td>119</td>
</tr>
<tr>
<td>Isolation, Control Unit</td>
<td>4700</td>
<td>NC</td>
<td>NC</td>
<td>NC</td>
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<tr>
<td>Vocabulary Words, Add'l</td>
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</table>

7770 CONFIGURATION CHART ... Maximum Feature Configuration Table.

<table>
<thead>
<tr>
<th>Feature No.</th>
<th>Line Group Assignment</th>
<th>Max. No. Features Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>#4677</td>
<td>1 2 3 4 5 6 7 8 9 10 11</td>
<td>11</td>
</tr>
<tr>
<td>#4679</td>
<td>1 2 3 4 5</td>
<td>5</td>
</tr>
<tr>
<td>#4668</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

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IBM 8101 STORAGE AND INPUT/OUTPUT UNIT

Purpose: Provides additional disk storage and device attachment capability for the 8100 Information System.

Model A10 - Device attachment capability

Model A11 - 29MB (29,327,360 bytes) - movable heads only and device attachments

Model A13 - 64MB (64,520,192 bytes) - movable heads only and device attachments

Maximum: Two per 8100 Information System with a 8130 Processor. One of the 8101s may be configured with Communication or Display/Printer features Type I or Type II. Four with an 8140 Processor. Two of the 8101s may be configured with Communication or Display/Printer features Type I or Type II. The maximum is one if the 8609 Magnetic Tape Unit mdl 1B is attached to the 8130 Processor or three if the 8609 Magnetic Tape Unit mdl 1B is attached to the 8140 Processor. See Table 2 for 8100 System maximums.

Highlights: The 8101 Storage and Input/Output Unit provides additional disk storage and device attachment capabilities for the 8100 Information System. The 8101 attaches to the I/O bus of the 8130 or 8140 Processor.

Disk storage for the 8101 mdls A11 and A13 is provided by a non-removable high speed direct access storage. Depending on the model selected, disk storage of up to 64 million bytes with movable heads is available. The disk storage operates at a data rate of 1,031,000 bytes per second. The average access time is 27 milliseconds with an average rotational delay of 9.6 milliseconds. Removable diskette storage of 1MB (985,088) bytes is available and operates at up to 62K bytes per second. The diskette drive can read/write in basic data exchange format on either the IBM Diskette 2D or the IBM Diskette Type 1.

The 8100 System can attach to any S/370 or 4300 Processor via the 3704/3705 for SNA/SDLC or BSC line control. The 8100 System can attach to the ICA of the S/370 mdl 115, 125, 135 or 138 processors for BSC line control. The IBM 8100 System can attach to the Communications Adapter of the 4331 Processor for BSC and/or SDLC line control.

The 8101 extends the capability of the 8100 Information System by providing for the attachment of a variety of input/output devices. These devices consist of displays, printers, magnetic tape, and device attachments and data collection units. The devices may be attached to the 8101 loops, data link attached loops, communication ports or direct attachment to the 8101.

Communication Attached devices - Devices that can be attached to the communication ports of the 8101 are the: 3260 Control Unit Display Station mdls 1, 2, 3, 4, 11, 12, 13, 14 with the 3260 Display Station mdls 1, 2, 3, 4, 3287 Printer mdls 1, 2 and 3289 Line Printer mdls 1, 2 - 3631 Plant Communication Controller mdl 1A, 1B - 3632 Plant Communication Controller mdl 1A, 1B - 8775 Display Terminal mdl 1 and 2 - 3767 Communication Terminal mdl 1, 2 - 3842 Loop Control Unit - 2741 Communications Terminal - TTY 33/35 or equivalent - non-IBM terminals compatible to 2780/3780 protocol - 8140 Processor - 8140 Processor - 8101 Storage and Input/Output Unit.

Loop Attached Devices at 2400 or 9600 bps - Devices that can be attached to a direct attached loop at 9600 bps or data link attached loop at 2400 bps are the - 3287 Printer mdls 1, 2 - 3289 Printer mdls 3 with 350 3680 Magnetic Tape Unit and the 3782 Card Reader and via the 3782 Card Reader Attachment Unit the 3521 Card Punch and 2502 Card Reader mdl A1 (see Note 1) - 3276 Control Unit Display Station mdls 11, 12, 13, 14 with the 3276 Display Station mdls 1, 2, 3, 4, 3287 Printer mdls 1, 2, 3, 4 - 2875 Display Terminal mdl 1 and 2 - 3641 Reporting Terminal mdl 1, 2 - 3642 Encoder Printer mdls 1, 2 - 3643 Keyboard Display mdls 1, 2, 3, 4, 5 - 3644 Automatic Data Unit - 3645 Printer - 3646 Scanner Control Unit -3647 Time and Attendance Terminal.

Loop Attached Devices at 38,400 bps - Devices that can be attached to a direct attached loop at 38,400 bps are the - 3287 mdls 11 and 12, 8775 Display Station mdls 11 and 12.

Direct Attached Devices - Devices that can be attached directly to the 8101 Storage and Input/Output Unit are the - 3277 Display Station mdls 1, 2 - 3284 Printer mdls 1, 2 - 3286 Printer mdls 1, 2 - 3287 Printer mdls 1, 2 - 3288 Line Printer - 8809 Magnetic Tape Unit mdl 1A.

NOTE 1: Dedication of a 9600 bps single line loop to the attachment of the 3287 mdl 1 printer should be considered in cases where the printer will be heavily utilized.

Loop Accessories and Wire: See M10000 pages for pricing and ordering instructions.

Customer Set-up (CSU): The 8101 Storage and Input/Output Unit is designated as a customer set-up thereby offering the customer early availability and relocation flexibility. Aids and configurators are provided to enable the 8101 to be properly ordered and configured. Set-up procedures are included with the customer's manual with each machine. An 8101 installation verification program will be shipped with each machine on a diskette. A clear indication that the machine is operational will be given.

If the user relocates and/or interchanges attaching units from one system to another, the user must consider priority and address compatibility of the processor and its attachment.

Prerequisites: 8130 or 8140 Processor for mdls A10, A11 or A13. The 8101 model A10 requires one Display and Printer Attachment Type I (#9941) or Communication Attachment Type I (#9943).

Bibliography: Available at a later date.

Color: Pebble gray is the only color available.

Specify: [1] Voltage (120 VAC, 1-phase, 3-wire, 60Hz): Specify #9891 for non-lock plug or #9890 for locking plug. If 4.3 meter (14 ft) cable is not desired, specify #9896 for 1.8 meter (6 ft) cable.

[2] Cabling: For cabling information see Accessories pages (M10000), appropriate 8100 System installation manuals and Processor Site Preparation Guides.

[3] Processor Attachment: Specify #9931 for 8130 Processor or #9932 for 8140 Processor.

[4] System Attachment: Each 8101 requires a specify code to identify one of the four sets of I/O addresses. Specify one of the following codes for each 8101 attaching to the same processor: #9921, #9922, #9923, or #9924. These specify codes may be selected in any sequence. Duplicate codes are not permitted within a system. Relocation and/or interchange of 8101 units from one system to another system requires checking to avoid duplication of the specify codes.

[5] Device or Communication Attachment: One must be specified for the 8101 mdl A10. The mdl A10 provides as part of the basic machine, the capabilities to attach Display/Printer or Communication facilities. On initial orders for the mdl A10, one of these capabilities must be specified. Further expansion of the mdl A10 is provided by special features. These same capabilities are provided by special features for the mdls A11 and A13. See Table 1 for additional configuration information.

[9941] - Display and Printer Attachment Type 1: Provides, in conjunction with feature #1505 and #1506, the capability for the attachment of 3277 Display, 3287 Printer and 3284, 3286 and 3288 Printers in any combination up to a maximum of twenty-four.

[9943] - Communication Attachment Type 1: Provides the capability for the attachment of loops and communication facilities in any combination up to a maximum of four. Additional special features for line control communication interface and modems are required to complete each communication facility selected.

[6] Terminal Requirements: For attachment of 3640 family of terminals see terminal requirements on the 8100 and/or 8140 Machine pages.

---

**PRICES:**

<table>
<thead>
<tr>
<th>Mdl</th>
<th>MRC</th>
<th>MLC</th>
<th>2 yr</th>
<th>Purchase</th>
<th>MM/MC/AMMCR</th>
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<tr>
<td>8101</td>
<td>A10</td>
<td>$201</td>
<td>$171</td>
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<td>A11</td>
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<td>55.50</td>
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<td></td>
<td>A13</td>
<td>524</td>
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<td>16,410</td>
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</tr>
</tbody>
</table>

Rental Plan: Plan D

Machine Group: A

Useful Life Category: 2

Purchase Option: 55%

Per Call: 1

Warranty: B

Initial Period of Maintenance Service: 3 mos.

Termination Charge Months: 5

Termination Charge Percent: 25%

Upper Limit Percent: 5%

Model Changes: Model upgrade requires replacement of the disk storage unit. Adequate provisions must be made for retaining data contained on the disk storage unit and elimination of user proprietary information.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

- Field conversion charge for Model A10 to A11 is $ 5,950*
- Field conversion charge for Model A10 to A13 is $11,010*
- Field conversion charge for Model A11 to A13 is $ 2,500**

* For mdl A10 w/o #1507 and no change in the Type 1 (see Table 1) feature requirement. Submit an RPQ for all other conversions.

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**SPECIAL FEATURES**

**Performance:** The maximum number of Features for Attaching Communications (FAC) capable of concurrent operation is a function of the speed of the line, the communication facility, the operating system installed and the application work load. The maximum number of communication features which can be physically installed can exceed the operational capability. Increased processor utilization will result from sustained operation of BSC at the maximum aggregate data rate and up to a maximum of twenty-four activity operating at lower priority levels. Analysis should be performed to determine the impact.

**Diagnositcs:** The 8100 System hardware and feature operation, diagnostic support and maintenance support described in 8100 System publications are dependent on the presence of functional support modules provided by Distributed Processing Programming Executive (DPPE) or Distributed Processing Control Executive (DPCX). Operational and maintenance conditions for the 8100 System are predicated on the presence of these functional support modules. Customers ordering 8100 System hardware without DPPE or DPCX should provide the functional support as contained and described in the Functional Definition Manual 8100 which will be available at the time of installation.

**DISPLAY AND PRINTER ATTACHMENT TYPE I** (#1501). Provides in conjunction with feature #1505 and #1506 the capability for the attachment of 3277 Display, 3287 Printer and 3289 Printers in any combination up to a maximum of twenty-four. Limitations: Not available with 8101 mdl A10. Not available with Communication Attachment Type I (#1503), Communications Attachment Type II (#1504) or Display and Printer Attachment Type II (#1502). See Table 1 for additional information. Maximum: One. See Table 2 for 8100 System maximums. Field installation: Yes. For field installation by purchase customer, see Note 2 under Table 1. Prerequisite: Communication Attachment Type I (#1503 or #9943).

**COMMUNICATION ATTACHMENT TYPE I** (#1503). Provides in conjunction with feature #1505 and #1506 the capability for the attachment of 3277 Display, 3287 Printer and 3289 Printers in any combination up to a maximum of twenty-four. Additional special features for line control, communication interface and modems are required to complete each communication facility selected. Limitations: Not available with 8101 mdl A10. Not available with Display And Printer Attachment Type I (#1501) or #9941 or Communication Attachment Type II (#1504). See Table 1 for additional information. Maximum: One. See Table 2 for 8100 System maximums. Field installation: Yes. For field installation by purchase customer, see Note 2 under Table 1. Prerequisite: Communication Attachment Type I (#1503 or #9943).

**DISPLAY AND PRINTER ATTACHMENT TYPE II** (#1502). Provides in conjunction with feature #1505 and #1506 the capability for the attachment of 3277 Display, 3287 Printer and 3289 Printers in any combination up to a maximum of twenty-four. Limitation: Not available with Display And Printer Attachment Type I (#1501 or #9941) or Communication Attachment Type II (#1504). See Table 1 for additional information. Maximum: One. See Table 2 for 8100 System maximums. Field installation: Yes. For field installation by purchase customer, see Note 2 under Table 1. Prerequisite: Communication Attachment Type II (#1503 or #9943).

**COMMUNICATION ATTACHMENT TYPE II** (#1504). Provides the capability for the attachment of loops and communications ports in any combination up to a maximum of four. Additional special features for line control, communication interface and modems are required to complete each communication facility selected. Limitation: Not available with Display And Printer Attachment Type II (#1502) or Display And Printer Attachment Type I (#1501 or #9941). See Table 1 for additional information. Only available with port positions one thru four. Maximum: One. See Table 2 for 8100 System maximums. Field installation: Yes. For field installation by purchase customer, see Note 2 under Table 1. Prerequisite: Communication Attachment Type II (#1503 or #9943).

**DISPLAY AND PRINTER ADAPTER** (#1505). Provides the attachment of the first four 3277 Display, 3287 Printer and 3289 Printers in any combination up to a maximum of four. Maximum: Five. See Table 2 for 8100 System maximums. Field installation: Yes. Prerequisite: Display And Printer Adapter (#1505).

**DISKETTE DRIVE AND MAGNETIC TAPE ATTACHMENT** (#1507). Provides in conjunction with feature #1505 and #1506 the capability for the attachment of Diskette Drive and Tape Attachment for the mdl A11 and A13. Maximum: One. See Table 1 for additional information. Maximum: One. See Table 2 for 8100 System maximums. Field installation: Yes.

**SDLC COMMUNICATIONS WITH BUSINESS MACHINE CLOCK** (#1601). Provides control for EIA RS-232-C interface, integrated modems, direct connection and CCITT V.35 interface. Limitation: In an 8100 System only ten of these features (#1601 or #1602) may be active at one time. Maximum: Eight. See Table 2 for 8100 System maximums. The maximum is reduced by one for each communications feature (#1602, 1603 or 1604) selected. Field installation: Yes. Prerequisite: Communications Attachment Type I or II (#1503, #1504 or #9943). Specify: Code as provided in FAC description in the "Communication Capabilities" section.

**SDLC COMMUNICATIONS WITHOUT BUSINESS MACHINE CLOCK** (#1602). Provides control for EIA RS-232-C or Digital Data Service Adapter (DDSA) interface, CCITT V.35 interface and Loop Adapter. Limitation: In an 8100 System only ten of these features (#1601 or #1602) may be active at one time. Maximum: Eight. See Table 2 for 8100 System maximums. The maximum is reduced by one for each communications feature (#1601, 1603 or 1604) selected. Field installation: Yes. Prerequisite: Communications Attachment Type I or II (#1503, #1504 or #9943). Specify: Code as provided in FAC description in the "Communication Capabilities" section.

**BSC/SS COMMUNICATIONS WITH BUSINESS MACHINE CLOCK** (#1603). Provides control for EIA RS-232-C interface, integrated modems or direct connection. Limitation: Start/Stop communications are not available with integrated modems. In an 8100 System with a 8130 Processor attached, the maximum aggregate BSC data rate is 9600 bps and 330 bps for Start/Stop. With an 8140 Processor attached, the maximum aggregate data rate is 19,200 bps and 660 bps for Start/Stop. Maximum: Eight. See Table 2 for 8100 System maximums. The maximum is reduced by one for each communications feature (#1601, 1602 or 1603) selected. Field installation: Yes. Prerequisite: Communication Attachment Type I or II (#1503, #1504 or #9943). Specify: Code as provided in FAC description in the "Communication Capabilities" section.
EIA RS-232-C INTERFACE (#3701). Provides interface to external input/output/data communication equipment or direct connection at speeds of up to 9600 bps. Maximum: One per selected communications feature (#1601, 1602, 1603 or 1604). Field Installation: Yes. Prerequisite: C Communications with Business Machine Clock (#1601), SDLC Communications without Clock (#1602), BSC/SS Communications with Business Machine Clock (#1603), and either SDLC Communications Feature Without Business Machine Clock (#1602) or BSC Communications Feature Without Business Machine Clock (#1604). Field Installation: Yes. Prerequisite: Loop Adapter (#4830). Specify: Code as provided in FAC description in the "Communication Capabilities" section.

**SECURITY COVER LOCKS (#5655).** This feature provides key operated security locks for the machine covers, restricting access to the machine interior and external cable connector area. See Security Lock Diskette (#5656) if security lock is required. Additional or replacement keys are not available from IBM. Maximum: One. Field Installation: Yes.

**SECURITY LOCK, DISKETTE (#5656).** This feature provides a key operated security lock to restrict access to the diskette magnetic media. It is accessible only by opening the front cover. For maximum security, the Security Cover Lock (#5655) must be used in addition to the diskette security lock. Additional or replacement keys are not available from IBM. Maximum: One. Field Installation: Yes.

**8100 System Maximums**

The following table lists the system maximums common to the 8130, 8140 and 8101. Depending on the processor and special features selected, these maximums may not be possible. See the appropriate Machines pages for additional feature information.

**TABLE 2**

<table>
<thead>
<tr>
<th>Feature/Function</th>
<th>8130</th>
<th>8140</th>
<th>8101</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diskette Drive</td>
<td>A31</td>
<td>A41</td>
<td>A51</td>
</tr>
<tr>
<td>Multi-speed Clock</td>
<td>1503</td>
<td>1504</td>
<td>1505</td>
</tr>
<tr>
<td>Tape Attachment</td>
<td>1507</td>
<td>1508</td>
<td>1509</td>
</tr>
<tr>
<td>Communications Ports</td>
<td>19</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>SDLC, BSC/SS Loop</td>
<td>4520</td>
<td>4521</td>
<td>4522</td>
</tr>
<tr>
<td>Diskette Drive *</td>
<td>1507</td>
<td>1508</td>
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<td>SDLC, BSC/SS Loop</td>
<td>4520</td>
<td>4521</td>
<td>4522</td>
</tr>
</tbody>
</table>

**NOTE 3:** Only one 8101 may have Communication and Display/Printer features with the 8130 Processor. Only two 8101 units may have Communication and Display/Printer feature with the 8140 Processor.

* One additional Diskette Drive (#4520) is available on a 8101.

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8101 Storage and Input/Output Unit (cont’d)

additional details. Reference to switched communications in the FAC codes, refers to the communication link between the 8100 System and the S/370 or 4300 Processors.

The 8101 special features allow a maximum of eight communication capabilities to be configured and designated as communication ports. Each communication port position (1 thru 8) must consist of a communications feature for SDLC, BSC or Start/Stop.

The SDLC communications feature is available with and without business machine clock (#1601, #1602). The BSC/SS communications feature (#1603) is available with business machine clock and the BSC Communications feature (#1604) is available without business machine clock. If an 8101 communications port is required to provide the attached facility with business machine clock at speeds greater than 2400 bps the Multi-speed Clock feature (#5200) is required. The Multi-speed Clock feature (#5200) can provide business machine clocking at speeds greater than 2400 bps.

In addition to selecting a communications feature (#1601, 1602, 1603, 1604) for each port configured in an 8101, a communication interface or integrated modem must be selected to support the communication facility attaching to that port. Direct connect at 4800 and 9600 bps require the Multi-speed Clock feature (#5200). Each port of the 8101 also requires the selection of a specific code to indicate the System 8100 FAC code selected for that port. Certain System 8100 FAC codes will require a second specific code to select options available within that facility: 2/4 wire, line speed or multipoint control/tributary.

NOTE: The selected option specified within a given FAC and specific port position can be changed in the field by Field Engineering. All such changes are chargeable at the applicable FE hourly rate.

Specify Codes and FAC Code Descriptions:

A specify code number is required to identify the selected FAC code and its physical port position. Communication Attachment Type I (#9443, #1503) is specified as port positions one thru four and Communication Attachment Type II (#1504) is specified as port positions five thru eight. The specify code is constructed by concatenating the selected FAC and its port position to the numerical suffix, e.g.: #9ABC where AB = FAC No. and C = Port Position.

FAC codes range in number from 08 to 61 resulting in FAC specify codes ranging in number from #9081 to #9618. Additional codes must be specified for selected options. Those codes are outlined in the FAC code descriptions. No two FAC codes can occupy the same port position. Configuration Manual GA27-2876 will aid in assigning the port positions.

--- LOOP ---

FAC No. FAC Code Description

SDLC

FAC 8 Loop, high speed single lobe at 38,400 bps
FAC 9 Loop, high speed, two lobe at 38,400 bps
FAC 10 Loop, single lobe at 9600 bps
FAC 11 Loop, two lobe at 9600 bps

FAC 8 - Loop, High Speed, Single Lobe -- Required for operating a loop at 38,400 bps. Limitations: Not available with FAC 09 Loop, High Speed, Two Lobe #9091 thru #9098 and FAC 21 and 29. Prerequisites: #1602 and #4830. Maximum: One per 8101. One per 8100 System. Specify: From the table below, specify the required code to complete the configuration for the port selected.

FAC Specify Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8

Port #9081 #9082 #9083 #9084 #9085 #9086 #9087 #9088

FAC 9 - Loop, High Speed, Two Lobe -- Required for operating a two lobe loop at 38,400 bps. Limitation: Not available with FAC 08 Loop, High Speed, Single Lobe (#9081 thru #9088) and FAC 21 and 29. Prerequisites: #1602, #4830 and #4835. Maximum: One per 8101. One per 8100 System. Specify: From the table below, specify the required code to complete the configuration for the port selected.

FAC Specify Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8

Port #9091 #9092 #9093 #9094 #9095 #9096 #9097 #9098

FAC 10 - Loop, Single Lobe -- Required for operating a loop at 9600 bps. Limitations: #1602 and #4830. Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8

Port #9101 #9102 #9103 #9104 #9105 #9106 #9107 #9108

FAC 11 - Loop, Two Lobe -- Required for operating two lobe loops at 9600 bps. Prerequisites: #1602, #4830 and #4835. Maximum: One for ports one thru four and one for ports five thru eight. Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8

Port #9111 #9112 #9113 #9114 #9115 #9116 #9117 #9118

--- SDLC ---

FAC No. FAC Code Description

EIA RS-232-C

FAC 12 600 or 1200 bps (external modem)
FAC 13 Up to 9600 bps (external modem)
FAC 15 600, 1200 or 2400 bps, direct connect with clock (no modem)
FAC 16 4800 or 9600 bps direct connect with clock (no modem)
FAC 17 Direct connect without clock

Integrated Modem

FAC 18 600 or 1200 bps non-switched
FAC 19 600 or 1200 bps switched with auto answer

AT&T Dataphone Digital Service

FAC 20 2400, 4800 or 9600 bps non-switched
FAC 21 56.00 bps non-switched

CCITT V.35

FAC 24 Direct connect with clock (no modem)
FAC 25 Direct connect with clock (no modem)
FAC 26 4800 or 9600 bps
FAC 27 Direct connect without clock (no r.o.dem)
FAC 29 56,000 bps non-switched

FAC 12 - EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock ... operating with external modem without clocking ... and point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ... or point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ... or point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ... or point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ...

FAC 13 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... or point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ... or point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ...

FAC 15 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal or 8100 System must not provide business machine clock) and direct connection up to 40 feet. Prerequisites: #1601 and #3701. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8

Port #9311 #9312 #9313 #9314 #9315 #9316 #9317 #9318

FAC 15 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal or 8100 System must not provide business machine clock) and direct connection up to 40 feet. Limitation: One Multi-speed Clock (#5200) is required for ports positions one thru four or five thru eight. Prerequisites: #1602, #3701 and #5200. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8

Port #9161 #9162 #9163 #9164 #9165 #9166 #9167 #9168

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FAC 17 - EIA RS-232-C Interface — Up to 9600 bps without business machine clock ... and direct connection up to 40 feet. Prerequisites: #1602 and #3701. Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9171 #9172 #9173 #9174 #9175 #9176 #9177 #9178

FAC 18 - Integrated Modem — 600 or 1200 bps ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Prerequisites: #1601 and #5500. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9181 #9182 #9183 #9184 #9185 #9186 #9187 #9188

2-wire 600 bps 9851 9852 9853 9854 9855 9856 9857 9858
1200 bps 9861 9862 9863 9864 9865 9866 9867 9868

4-wire 600 bps 9741 9742 9743 9744 9745 9746 9747 9748
1200 bps 9751 9752 9753 9754 9755 9756 9757 9758

FAC 19 - Integrated Modem — 600 or 1200 bps ... point-to-point switched with auto answer 2 wire. Prerequisites: #1601 and #1500. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9591 #9592 #9593 #9594 #9595 #9596 #9597 #9598

600 bps 9741 9742 9743 9744 9745 9746 9747 9748
1200 bps 9751 9752 9753 9754 9755 9756 9757 9758

FAC 20 - Digital Network Interface (to AT&T Dataphone Digital Service) — 2400, 4800, 9600 bps without business machine clock ... and 4 wire point-to-point non-switched ... or multipoint non-switched. Prerequisites: #1602 and #5660. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9201 #9202 #9203 #9204 #9205 #9206 #9207 #9208

Point-to-point or Multipoint Control
2400 bps 9001 9002 9003 9004 9005 9006 9007 9008
4800 bps 9051 9052 9053 9054 9055 9056 9057 9058
9600 bps 9091 9092 9093 9094 9095 9096 9097 9098

Multipoint Tributary
2400 bps 9101 9102 9103 9104 9105 9106 9107 9108
4800 bps 9151 9152 9153 9154 9155 9156 9157 9158
9600 bps 9191 9192 9193 9194 9195 9196 9197 9198

FAC 21 - Digital Network Interface (to AT&T Dataphone Digital Service) — 56,000 bps without business machine clock ... point-to-point non-switched operation. Prerequisites: #1602 and #5660. Maximum: One per 8101, system maximum is one per 8100 System (not available with FAC codes 8, 9 or 29). Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9211 #9212 #9213 #9214 #9215 #9216 #9217 #9218

FAC 24 - CCITT V.35 Interface — 600, 1200 or 2400 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. Prerequisites: #1601 and #1550. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9241 #9242 #9243 #9244 #9245 #9246 #9247 #9248

600 bps 9741 9742 9743 9744 9745 9746 9747 9748
1200 bps 9751 9752 9753 9754 9755 9756 9757 9758
2400 bps 9761 9762 9763 9764 9765 9766 9767 9768

FAC 25 - CCITT V.35 Interface — 4800 or 9600 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. Limitation: One Multi-speed Clock is required for port position one thru four or five thru eight. Prerequisites: #5200. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9251 #9252 #9253 #9254 #9255 #9256 #9257 #9258

4800 bps 9771 9772 9773 9774 9775 9776 9777 9778
9600 bps 9781 9782 9783 9784 9785 9786 9787 9788

FAC 27 - CCITT V.35 Interface — Up to 9600 bps without business machine clock ... and direct connection up to 1000 feet. Prerequisites: #1602 and #1550. Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9271 #9272 #9273 #9274 #9275 #9276 #9277 #9278

FAC 29 - CCITT V.35 Interface — 56,000 bps without business machine clock and external data communication equipment with clock, and point-to-point non-switched. Limitation: Not available when 8101 is attached to the 8130 Processor. Prerequisites: #1602 and #1550. Maximum: One per 8101. System maximum is one per 8100 System. Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9291 #9292 #9293 #9294 #9295 #9296 #9297 #9298

--- --- --------- ----

FAC No. FAC Code Description

**EIA RS-232-C**

<table>
<thead>
<tr>
<th>FAC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAC 40</td>
<td>600 to 1200 bps (external modem)</td>
</tr>
<tr>
<td>FAC 41</td>
<td>Up to 9600 bps (external modem)</td>
</tr>
<tr>
<td>FAC 43</td>
<td>600, 1200 or 2400 bps, direct connect with clock (no modem)</td>
</tr>
<tr>
<td>FAC 44</td>
<td>4800 or 9600 bps, direct connect with clock (no modem)</td>
</tr>
</tbody>
</table>

**AT&T Dataphone Digital Service**

<table>
<thead>
<tr>
<th>FAC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAC 45</td>
<td>600 or 1200 bps non-switched</td>
</tr>
</tbody>
</table>

**EIA RS-232-C Interface** — 600 to 1200 bps without business machine clock ... operating with external modem with no clock ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Prerequisites: #1602 and #3701. Specify: From the table below, specify the required code to complete the configuration for each port selected.

**Integrated Modem**

<table>
<thead>
<tr>
<th>FAC</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAC 40</td>
<td>EIA RS-232-C Interface — 600 to 1200 bps with business machine clock ... operating with external modem with no clock ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Prerequisites: #1602 and #3701. Specify: From the table below, specify the required code to complete the configuration for each port selected.</td>
</tr>
</tbody>
</table>
FAC Code
Port I Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9441 #9442 #9443 #9444 #9445 #9446 #9447 #9448
4800 bps 9771 9772 9773 9774 9775 9776 9777 9778
9600 bps 9781 9782 9783 9784 9785 9786 9787 9788

FAC 45 - Integrated Modem - 600 or 1200 bps ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire.
Prerequisites: #1603 and #5500. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

Port Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9453 #9454 #9455 #9456 #9457 #9458
2-wire 600 bps 9851 9852 9853 9854 9855 9856 9857 9858
1200 bps 9861 9862 9863 9864 9865 9866 9867 9868
4-wire 600 bps 9741 9742 9743 9744 9745 9746 9747 9748
1200 bps 9751 9752 9753 9754 9755 9756 9757 9758

FAC 47 - Digital Network Interface (to AT&T Dataphone Digital Service) - 2400, 4800 or 9600 bps without business machine clock ... 4 wire point-to-point non-switched ... or multipoint non-switched. Prerequisites: #1604 and #5860. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

Port Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9471 #9472 #9473 #9474 #9475 #9476 #9477 #9478
Point-to-point or Multipoint Control 2400 bps 9001 9002 9003 9004 9005 9006 9007 9008
4800 bps 9021 9022 9023 9024 9025 9026 9027 9028
4800 bps 9041 9042 9043 9044 9045 9046 9047 9048
Multipoint Tributary 2400 bps 9011 9012 9013 9014 9015 9016 9017 9018
4800 bps 9031 9032 9033 9034 9035 9036 9037 9038
9600 bps 9051 9052 9053 9054 9055 9056 9057 9058

--- START/STOP ---

FAC No. FAC Code Description
EIA RS-232-C FAC 60 110, 134.5, 150, 300 or 600 bps (external modem)
FAC 61 110, 134.5, 150, 300 or 600 bps, direct connect with clock (no modem)

FAC 60 - EIA RS-232-C Interface - 134.5, 300, 600 bps with business machine clock ... operating with external modem ... and point-to-point non-switched facilities. See M 2700 pages for specific information on communication facilities and other attachment information.
Also 110 or 150 bps with business machine clock ... operating with external modem ... and point-to-point non-switched facilities will be provided under provisions of the IBM Multiple Supplier System Policy. Limitation: The 600 bps line speed is not available when the 8101 is attached to an 8130 Processor. Prerequisites: #1603 and #3701. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

Port Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9601 #9602 #9603 #9604 #9605 #9606 #9607 #9608
110 bps 9701 9702 9703 9704 9705 9706 9707 9708
134.5 bps 9711 9712 9713 9714 9715 9716 9717 9718
150 bps 9721 9722 9723 9724 9725 9726 9727 9728
300 bps 9731 9732 9733 9734 9735 9736 9737 9738
600 bps 9741 9742 9743 9744 9745 9746 9747 9748

FAC 61 - EIA RS-232-C Interface - 110, 134.5, 150, 300, 600 bps with business machine clock ... operating with no modem (the attached terminal must provide its own business machine clock) ... and direct connection to 40 feet. Limitation: The 600 bps line speed is not available when the 8101 is attached to an 8130 Processor. Prerequisites: #1603 and #3701. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

Port Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6 Port 7 Port 8
Port #9611 #9612 #9613 #9614 #9615 #9616 #9617 #9618
110 bps 9701 9702 9703 9704 9705 9706 9707 9708
134.5 bps 9711 9712 9713 9714 9715 9716 9717 9718
150 bps 9721 9722 9723 9724 9725 9726 9727 9728
300 bps 9731 9732 9733 9734 9735 9736 9737 9738
600 bps 9741 9742 9743 9744 9745 9746 9747 9748

HOST AND TERMINAL MODEN FACILITIES
For communication facilities and modem attachment data, see the M 2700 and appropriate Machines pages for additional information.

DIRECT CONNECTION ATTACHMENT
In addition to terminal attachment to the 8100 System through common carrier facilities (see M 2700 pages) or local loops, attachment can be made by direct connect. The direct connect can be made by using the SDLC (FAC 15 or 16), BSC (FAC 43 or 44) and Start/Stop (FAC 61). Shown below are the direct connect attachable devices and required device feature numbers. The IBM 8100 Information System Installation Manual - Physical Planning, G27-2877, will assist in the selection of direct connect cables.

FAC Attach Code Device Speeds (bps) Device Feature No.
15 3276 600, 1200, 2400 #1701 w/#9491 and #6302
16 3276 4800, 9600 #1701, w/#9491 and #6302
15 3767 600, 1200, 2400 #3718, w/#9707, #9533
15 3767 134.5 #9115 or #9120
15, 24 8130/8140/8101 600, 1200, 2400 #3701 (FAC 17) or #1550
8775-11, 12 600, 1200, 2400 (FAC 27) and #1602
8775-11, 12 4800, 9600 #3701 (FAC 15) or #1550 (FAC 24)
16, 25 8130/8140 4800, 9600 #3701 (FAC 17) or #1550
8775-11, 12 4800, 9600 (FAC 27) and #1602
8775-11, 12 4800, 9600 #3701 (FAC 16) or #1550 (FAC 25)
43 2780/3780 Line 600, 1200, 2400 Refer to specific device Protocol
44 2780/3780 Line 4800, 9600 Refer to specific device Protocol

Note 4: For attachment of devices that conform to 2780/3780 protocol.

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IBM 8130 PROCESSOR

Purpose: Provides control, storage, processing capability, disk and diskette storage, and device attachment capabilities for the IBM 8100 Information System.

Models: The following models of the 8130 are available depending on processor storage size and non-removable disk storage size. Some models have fixed head capability as well as movable heads for the non-removable, high-speed, direct access disk storage. All 8130 models include removable diskette storage with up to 1 million bytes of storage.

<table>
<thead>
<tr>
<th>Model</th>
<th>Processor Storage (bytes)</th>
<th>Non Removable Disk Capacity (million bytes)</th>
<th>Fixed Head Disk Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A21</td>
<td>256K (262,144)</td>
<td>29MB (29,327,360)</td>
<td>None</td>
</tr>
<tr>
<td>A22</td>
<td>256K (262,144)</td>
<td>23MB (23,461,888)</td>
<td>131,072</td>
</tr>
<tr>
<td>A23</td>
<td>256K (262,144)</td>
<td>64MB (64,520,192)</td>
<td>131,072</td>
</tr>
<tr>
<td>A24</td>
<td>256K (262,144)</td>
<td>58MB (58,654,720)</td>
<td>131,072</td>
</tr>
</tbody>
</table>

Maximum: One per 8100 Information System.

Highlights: The 8130 Processor is a multi-level, interrupt driven processor which provides control, processing capability, processor storage, disk and diskette storage and communication features for the 8100 Information System. The flexibility offered by the 8130 allows the system to configure a system, while retaining the ability to modify the system to meet future needs.

Specifications:
- System control and processing is provided by machine program instructions and up to eight I/O hardware interrupt levels provide for interrupt processing. The 8130 provides 256K (262,144) bytes of processor storage that can be expanded to a maximum of 512K (524,288) bytes and provision for dynamic addressing and storage protection for up to 4 million bytes of logical storage.
- The 8130 with a special feature for system expansion provides for the attachment of up to two 8101 Storage and Input/Output Units, one of which may be configured with Communication and Display/Printer Feature Type I or Type II, or one 8101 Storage and Input/Output Unit and one 8809 Magnetic Tape Unit mdl 1B. An alternate configuration can consist of a 8130, two 8101 Storage and Input/Output Units, and one 8809 Magnetic Tape Unit mdl 1A. Up to three additional 8809 Magnetic Tape Units can be attached to the 8809 Magnetic Tape Unit mdl 1A or 1B.
- The 8130 Processor is provided with fixed high speed direct access storage. Depending on the 8130 model selected, disk storage of up to 64 million bytes with movable heads or up to 58 million bytes of disk storage with movable and fixed heads is available. The disk storage operates at a data rate of 1.031 million bytes per second. The average access time is 27 milliseconds with an average rotational delay of 9.6 milliseconds. Removable diskette storage is available with up to 1MB (985,068) of storage operating at up to 62K bytes per second data rate. The diskette drive can read/write in basic exchange format on either the IBM diskette 2D or the IBM Diskette Type 2.
- The 8100 System can attach to any 8370 or 4300 Processors via 3704/3705 for SNA/SDLC or BSC line control. The 8100 System can attach to the ICA of the 115, 125, 135 or 138 processors for BSC line control. The IBM 8100 System can attach to the Communications Adapter of the 4331 Processor for BSC and/or SDLC line control. For specific attachment, see M 2700 pages.

The capability of the 8100 Information System is further extended by providing for the attachment of a variety of input/output devices. These devices may be attached to the 8130 via communication features which include data link, direct connect, and loops that are direct attached or data link attached loops. The 8130 provides for the attachment of two communication ports which can be expanded by optional features up to a maximum of six. With the 8101 Storage and Input/Output Unit attached, the communication ports physically attached can be further increased by up to eight, providing an 8100 System maximum of fourteen communication ports.

Loop Attached Devices at 2400 or 9600 bps: Devices that can be attached to a direct attached loop at 9600 bps or data link attached loop at 2400 bps are the - 3287 Printer mdls 11, 12, -

3289 Printer mdl 3 with 3501 Card Reader and via the 3782 Card Attachment Unit the 3521 Card Punch and 2502 Card Reader mdl A1 (See Note 1) - 3276 Control Unit Display Station mdls 1, 2, 3, 4, 11, 12, 13, 14 with 3278 Display Station mdls 1, 2, 3, 4, 5, 3267 Printer mdls 1, 2 and 3269 Line Printer mdls 1, or - 3877 Display Terminal mdls 11 and 12 - 3274 Communications Terminal - TTY 33/35 equivalent - non-IBM terminals conforming to the 2780/3780 line protocol - 3842 Loop Control Unit - 8130 Processor - 8140 Processor - 8101 Storage and Input/Output Unit.

Loop Attached Devices at 2400 or 9600 bps: Devices that can be attached to a direct attached loop at 9600 bps or data link attached loop at 2400 bps are the - 3287 Printer mdls 11, 12, -

3289 Printer mdl 3 with 3501 Card Reader and via the 3782 Card Attachment Unit the 3521 Card Punch and 2502 Card Reader mdl A1 (See Note 1) - 3276 Control Unit Display Station mdls 1, 2, 3, 4, 5, 3267 Printer mdls 1, 2 and 3269 Line Printer mdls 1, or - 3877 Display Terminal mdls 11 and 12 - 3274 Communications Terminal - TTY 33/35 equivalent - non-IBM terminals conforming to the 2780/3780 line protocol - 3842 Loop Control Unit - 8130 Processor - 8140 Processor - 8101 Storage and Input/Output Unit.

Loop Attached Devices at 38,400 bps: Devices that can be attached to a direct attached loop at 38,400 bps are the - 3287 mdls 11, 12. The 8775 Display Terminal mdl 1, 2 - 3664 Automatic Data Unit.

Direct Attached Devices: Devices that can be attached directly to the processor are the - 8101 Storage and Input/Output Unit - 8809 Magnetic Tape Unit mdl 1B.

Note: 1: Dedication of a 9600 bps single lobe loop to the attachment of the 3289 mdls printer should be considered in cases where the printer will be heavily utilized.

Loop Accessories and Wire: See M10000 pages for ordering instructions.

Customer Set-up: The 8130 Processor is designated a customer set-up unit thereby offering the customer early availability and relocation flexibility. Aids and configurators are provided to facilitate the configuration and ordering of the 8130. Set-up procedures for the customer will be shipped with each machine on a diskette. A clear indication that the machine is operational will be given.

If the user relocates and/or interchanges attaching units from one system to another, the user must consider priority and address compatibility of the processor and its attachments.

PREREQUISITES: None.

Bibliography: Available at a later date.

Color: Pebble gray is the only available color.

Specify:
- [1] (120 VAC, 1-phase, 3-wire, 60Hz): $9591 for non-locking plug, or $9890 for locking plug. If 4.3 meter (14 ft) power cord is not desired, specify $9986 for 1.8 meter (6 ft) cable.
- [2] Cabling: For cabling information see Accessories pages (M10000), appropriate 8100 Information System installation manuals and Processor Site Preparation Guides.
- [3] Programming Configuration: Specify $9700 for Distributed Processing Programming Executive (DPPEX), $9710 for Distributed Processing Control Executive (DPCX), or $9720 for DPPEX and DPCX, or $9730 for all other configurations.
- [4] Terminal Requirements: Specify $9800 (off line 3640 terminal exerciser) if ordering any of the following terminals: 3641, 3642, 3643, 3644, 3645, 3646 or 3647 - 1) To 62K bytes of disk space before the initial load. 2) When the first terminal is ordered to attach via an 8101, and none are attached to the processor. 3) Via when the first terminal is field installed on an 8100 System.

Maximum: One per 8100 System. Field installation: Yes.

<table>
<thead>
<tr>
<th>PRICES: Mdl</th>
<th>MRC</th>
<th>2 yr</th>
<th>Purchase</th>
<th>MLC</th>
</tr>
</thead>
<tbody>
<tr>
<td>A21</td>
<td>705</td>
<td>$600</td>
<td>$24,000</td>
<td>122</td>
</tr>
<tr>
<td>A22</td>
<td>729</td>
<td>620</td>
<td>24,720</td>
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<tr>
<td>A23</td>
<td>752</td>
<td>640</td>
<td>25,440</td>
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<tr>
<td>A24</td>
<td>776</td>
<td>660</td>
<td>26,160</td>
<td>138</td>
</tr>
</tbody>
</table>


Model Changes: Model upgrade may require replacement of disk storage unit. Adequate provisions must be made for retaining data contained on disk storage unit and elimination of user proprietary information.

MODEL UPGRADE PURCHASE PRICES (there are no additional installation charges)

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
<th>A22</th>
<th>A23</th>
<th>A24</th>
</tr>
</thead>
<tbody>
<tr>
<td>A21</td>
<td>$2,200</td>
<td>$2,500</td>
<td>$3,000</td>
<td></td>
</tr>
<tr>
<td>A22</td>
<td>2,500</td>
<td>2,800</td>
<td>3,200</td>
<td></td>
</tr>
<tr>
<td>A23</td>
<td>2,500</td>
<td>2,800</td>
<td>3,200</td>
<td></td>
</tr>
</tbody>
</table>

Customer price quotations and customer order and acknowledgment letters for purchase of must state: Installation of this model change involves removal of parts which become the property of IBM.”

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FEATURE EXPANSION TYPE 1 (#1520). Allows the 8130 to be expanded from two communication ports to six communication ports. #1520 is required for the attachment of two lobe loops or communication features requiring the Multi-speed Clock (#5200). Maximum: One per 8130. Field Installation: Yes.

SYSTEM EXPANSION (#1530). Provides programmable hardware sublevel interrupt determination. Requires one for attachment of up to two 8101 Storage and Input/Output Units or one 8101 and/or one 8809 Magnetic Tape Unit mid 1B directly to the 8130. Maximum: One per 8130. Field Installation: Yes.

CCITT V.35 INTERFACE (#1550). Provides interface for data transmission at speeds up to 9600 bps. Maximum: One per selected communications feature (#1601 or #1602). Field Installation: Yes. Prerequisite: SDL Communications with Clock (#1602), SDL Communications without Clock (#1601) or SDL Communications with Clock (#1602) and Multi-speed Clock (#5200).

SDL COMMUNICATIONS WITH BUSINESS MACHINE CLOCK (#1602). Provides control for EIA RS-232-C interface, integrated modems, direct connection and CCITT V.35 interface. Limitation: In an 8100 System only ten of these features (#1601 or #1602) may be active at one time. Maximum: Two without Feature Expansion Type 1 (#1520) ... with #1520, the maximum is six. Maximum is fourteen per 8100 System (see Note 2) with a 8130. The maximum is reduced by one for each communications feature (#1602, 1603, 1604). Field Installation: Yes. Specify: Code as provided in FAC descriptions in the "Communications Facilities" section.

SDL COMMUNICATIONS WITHOUT BUSINESS MACHINE CLOCK (#1601). Provides control for EIA RS-232-C or Digital Data Service Adapter interface, direct connection and CCITT V.35 interface. Limitation: In an 8100 System only ten of these features (#1601 or #1602) may be active at one time. Maximum: Two without Feature Expansion Type 1 (#1520), with #1520, maximum is six. Maximum is fourteen per 8100 System (see Note 2) with a 8130. The maximum is reduced by one for each communications feature (#1601, 1603, 1604). Field Installation: Yes. Specify: Code as provided in FAC descriptions in the "Communications Facilities" section.

BSC/SS COMMUNICATIONS WITH BUSINESS MACHINE CLOCK (#1603). Provides control for EIA RS-232-C or Digital Data Service Adapter interface, integrated modems or direct connection. In an 8100 System the maximum aggregate BSC data rate is 9600 bps and 330 bps for Start/Stop. Limitation: Start/Stop communications not available with integrated modems. Maximum: Two without Feature Expansion Type 1 (#1520), with #1520 maximum is six. Maximum is fourteen per 8100 System (see Note 2) with a 8130. The maximum is reduced by one for each communications feature (#1601, 1602, 1604). Field Installation: Yes. Specify: Code as provided in FAC descriptions in the "Communications Facilities" section.

BSC COMMUNICATIONS WITHOUT BUSINESS MACHINE CLOCK (#1604). Provides control for EIA RS-232-C or Digital Data Service Adapter interface and direct connection. Limitation: In an 8100 System the maximum aggregate BSC data rate is 9600 bps. Maximum: Two without Feature Expansion Type 1 (#1520), six with #1520. The maximum is fourteen per 8100 System (see Note 2) with a 8130. The maximum is reduced by one for each communications feature (#1601, 1602, 1603). Field Installation: Yes. Specify: Code as provided in FAC descriptions in the "Communications Facilities" section.

PROCESSOR STORAGE TYPE 1 (#1710). Provides 128K (131,072) bytes of additional processor storage. Maximum: One per 8130. Code as provided in FAC descriptions in the "Communications Facilities" section.


EIA RS-232-C INTERFACE (#3701). Provides interface to external modem/data communication equipment or direct connection at speeds of up to 9600 bps. Maximum: One per communications feature (#1601, 1602, 1603 or 1604). Field Installation: Yes. Prerequisite: SDL Communications with Clock (#1601), SDL Communications without Clock (#1602), BSC/SS Communications with Clock (#1603), BSC Communications without Clock (#1604), SDL Communications without Business Machine Clock (#1602) and Multispeed Clock (#5200). Specify: Code as provided in FAC description in the "Communications Facilities" section.

KEYLOCK (#4655). This keylock feature provides processor security by the selection of three modes of operation. These consist of: Disable power on and disable operator panel ... Enable power on but disable operator panel ... Enable power on and enable operator panel. For additional or replacement keys, see M10000 pages. Maximum: One. Field Installation: Yes.

LOOP ADAPTER (#4830). Provides for direct attachment of a single lobe loop at 9600 or 38,400 bps. Maximum: Two without Feature Expansion Type 1 (#1520). With #1520, the maximum is six. Maximum is fourteen per 8100 System (see Note 2) with a 8130. Only one of these features may operate at 38,400 bps. Maximum is six per 8100 System. Field Installation: Yes. Prerequisite: SDL Communications without Clock (#1602). Specify: Code as provided in FAC description in the "Communications Facilities" section.

LOOP ADAPTER SECOND LOBE (#4835). Provides for the attachment of a separate physical loop cable to extend the coverage and availability of the directly attached loop. Maximum: Three per 8130. Maximum is five per 8100 System (see Note 2) with a 8130. Field Installation: Yes. Prerequisites: Loop Adapter (#4830) and Feature Expansion Type 1 (#1520). Specify: Code as provided in FAC description in the "Communications Facilities" section.

MULTI-SPEED CLOCK (#5200). Provides business machines clocking at 4800 bps and 9600 bps for direct connection. Can provide multiple speeds simultaneously. Limitation: Available for ports positions three through six only. Maximum: One per selected communications feature with a 8130. The maximum is three per 8100 System with a 8130. Field Installation: Yes. Prerequisites: Feature Expansion Type 1 (#1520) and either SDL Communications Feature without Clock (#1602) or BSC/SS Communications Feature without Clock (#1604). Specify: Code as provided in FAC description in the "Communications Facilities" section.

MODEM, INTEGRATED, NON-SWITCHED (#5500). Provides interface to common carrier leased facilities at 600 or 1200 bps. Limitation: Not available for Start/Stop communication facilities. Maximum: One per selected communications feature with a 8130. Field Installation: Yes. Prerequisites: SDL Communications with Clock (#1601) or SDL Communications without Clock (#1602). Specify: Code as provided in FAC description in the "Communications Facilities" section.

MULTI-CONFIGURATION Communications Service Adapter Interface (DDSA) (#5660). Provides interface to AT&T Dataphone** Digital Service Network for transfer of digital data at speeds of 2400, 4800 or 9600 bps. Available for point-to-point line configurations or multipoint line configurations. Maximum: One per selected communications feature (#1601 or #1604). Field Installation: Yes. Prerequisite: SDL Communications without Clock (#1602), or BSC Communications without Clock (#1604). Specify: Code as provided in FAC description in the "Communications Facilities" section.

SECURITY COVER LOCKS (#6555). This feature provides a key operated security lock for the machines covers, restricting access to the machine interior and external cable connector area. See Security Lock Diskette (#6566) if diskette security is required. Additional or replacement keys are not available from IBM. Maximum: One. Field Installation: Yes.

SECURITY LOCK, DISKETTE (#6566). This feature provides a key operated security lock to restrict access to the diskette magneto-optical media. It is accessible only by prior maximum system security, the Security Cover Lock (#6555) must be used in addition to the diskette security lock. Additional or replacement keys are not available from IBM. Maximum: One. Field Installation: Yes.

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IBM
8130 Processor (cont’d)

NOTE 2: An 8100 System consisting of a 8130 Processor and attached 8101 Storage and Input/Output Unit.

Special Feature Prices

<table>
<thead>
<tr>
<th>Feature Expansion Type</th>
<th>MRC</th>
<th>EIA RS-232-C Interface</th>
<th>CCITT V.35 Interface</th>
<th>SDLC Communication Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1520</td>
<td>14</td>
<td>12</td>
<td>405</td>
<td>15</td>
</tr>
<tr>
<td>#1530</td>
<td>71</td>
<td>71</td>
<td>2,400</td>
<td>150</td>
</tr>
<tr>
<td>#1550</td>
<td>15</td>
<td>13</td>
<td>110</td>
<td>2,000</td>
</tr>
</tbody>
</table>

NOTE: The selected option specified within a given FAC and specific port position can be changed in the field by Field Engineering. All such changes are chargeable at the applicable FB hourly rate.

Specify and FAC Code Descriptions:

A specific code number is required to identify the selected FAC code and its physical port position. The code must be construct-

ced by concatenating the selected FAC and its port position to the numeral 9, e.g.:

w Bus Machine Clock 1601

#9ABC where AB = FAC No. ... C = Port Position.

FAC codes range in number from 08 to 61 resulting in FAC specific codes ranging in number from #9081 to #9616. Additional
codes must be specified for selected options. No two FAC codes can occupy the same port position. Configuration Manual GA27-2976 will
aid in assigning the port positions.

- - - LOOP - - -

FAC No. FAC Code Description

| FAC 8 | Loop, high speed single lobe at 38,400 bps |
| FAC 9 | Loop, high speed two lobe at 38,400 bps |
| FAC 10 | Loop, single lobe at 9600 bps |
| FAC 11 | Loop, two lobs at 9600 bps |

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SDLC

FAC 8 | Loop, high speed single lobe at 38,400 bps |
| FAC 9 | Loop, high speed two lobe at 38,400 bps |
| FAC 10 | Loop, single lobe at 9600 bps |
| FAC 11 | Loop, two lobs at 9600 bps |

EIA RS-232-C

FAC 12 | EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock . . . operating with external modem without clocking ... and point-to-point switched 2 wire ... or point-to-point non-switched 2 or 4 wire ... or multipoint 4 wire. Limitation: Re-

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### FAC Selection

<table>
<thead>
<tr>
<th>FAC No.</th>
<th>FAC Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAC 40</td>
<td>600 or 1200 bps - external modem</td>
</tr>
<tr>
<td>FAC 41</td>
<td>Up to 9600 bps - external modem</td>
</tr>
<tr>
<td>FAC 43</td>
<td>600, 1200 or 2400 bps direct connect with clock (no modem)</td>
</tr>
<tr>
<td>FAC 44</td>
<td>4800 or 9600 bps direct connect with clock (no modem)</td>
</tr>
</tbody>
</table>

**FAC 20** - Digital Network Interface (to AT&T Dataphone Digital Service) — 2400, 4800, 9600 bps without business machine clock ... and 4 wire point-to-point non-switched or multipoint non-switched. Limitation: Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. Prerequisites: #1602 and #9660. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9201 #9202 #9203 #9204 #9205 #9206</td>
<td></td>
</tr>
</tbody>
</table>

Point-to-point or Multipoint Control

- 2400 bps: 9001 9002 9003 9004 9005 9006
- 4800 bps: 9041 9042 9043 9044 9045 9046
- 9600 bps: 9011 9012 9013 9014 9015 9016

Multipoint Tributary

- 2400 bps: 9011 9012 9013 9014 9015 9016
- 4800 bps: 9031 9032 9033 9034 9035 9036
- 9600 bps: 9051 9052 9053 9054 9055 9056

**FAC 24** - CCITT V.35 Interface — 600, 1200 or 2400 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. Limitation: Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9241 #9242 #9243 #9244 #9245 #9246</td>
<td></td>
</tr>
</tbody>
</table>

- 600 bps: 9741 9742 9743 9744 9745 9746
- 1200 bps: 9751 9752 9753 9754 9755 9756
- 2400 bps: 9761 9762 9763 9764 9765 9766

**FAC 15 - EIA RS-232-C Interface** — 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal or 8100 System must not provide business machine clock) ... and direct connection up to 40 feet. Prerequisites: #1520, #1602, #3701 and #5200. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9151 #9152 #9153 #9154 #9155 #9156</td>
<td></td>
</tr>
</tbody>
</table>

- 600 bps: 9741 9742 9743 9744 9745 9746
- 1200 bps: 9751 9752 9753 9754 9755 9756
- 2400 bps: 9761 9762 9763 9764 9765 9766

**FAC 16 - EIA RS-232-C Interface** — 4800 or 9600 bps with business machine clock ... operating with no modem (attached downstream terminal must not provide machine clock) ... and direct connection up to 40 feet. Prerequisites: #1520, #1602, #3701 and #5200. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port N/A N/A #9164 #9165 #9166 #9167</td>
<td></td>
</tr>
</tbody>
</table>

- 4800 bps: 9773 9774 9775 9776
- 9600 bps: 9783 9784 9785 9786

**FAC 17 - EIA RS-232-C Interface** — up to 9600 bps without business machine clock ... operating with other 8100 System (with business machine clock) ... and direct connection up to 40 feet. Limitation: Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9171 #9172 #9173 #9174 #9175 #9176</td>
<td></td>
</tr>
</tbody>
</table>

**FAC 18 - Integrated Modem** — 600 or 1200 bps ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Limitation: Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6. Prerequisites: #1602 and #3701. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9181 #9182 #9183 #9184 #9185 #9186</td>
<td></td>
</tr>
</tbody>
</table>

2 wire
- 600 bps: 9851 9852 9853 9854 9855 9856
- 1200 bps: 9861 9862 9863 9864 9865 9866
4 wire
- 600 bps: 9741 9742 9743 9744 9745 9746
- 1200 bps: 9751 9752 9753 9754 9755 9756

**FAC 19 - Integrated Modem** — 600 or 1200 bps ... point-to-point switched with automatic power 2 wire ... or multipoint non-switched 2 wire. Limitation: Requires Feature Expansion Type 1 (#1520) and #5501. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9191 #9192 #9193 #9194 #9195 #9196</td>
<td></td>
</tr>
</tbody>
</table>

2 wire
- 600 bps: 9741 9742 9743 9744 9745 9746
- 1200 bps: 9751 9752 9753 9754 9755 9756

**FAC 21 - CCITT V.35 Interface** — 600, 1200 or 2400 bps with business machine clock ... operating with other 8100 System (with business machine clock) ... and direct connection up to 1000 feet. Prerequisites: #1520, #1602, #1550 and #5200. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection Port 1 Port 2 Port 3 Port 4 Port 5 Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9271 #9272 #9273 #9274 #9275 #9276</td>
<td></td>
</tr>
</tbody>
</table>

--- BSC ---
8130 Processor (cont’d)

FAC 41 - EIA RS-232-C Interface - Up to 9600 bps without business machine clock ... operating with external data communication equipment ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Limitation: Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6.

Prerequisites: #1604 and #3701. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection</th>
<th>Port 1</th>
<th>Port 2</th>
<th>Port 3</th>
<th>Port 4</th>
<th>Port 5</th>
<th>Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9411 #9412 #9413 #9414 #9415</td>
<td>Port 1</td>
<td>Port 2</td>
<td>Port 3</td>
<td>Port 4</td>
<td>Port 5</td>
<td>Port 6</td>
<td></td>
</tr>
</tbody>
</table>

FAC 43 - EIA RS-232-C Interface - 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal must not provide machine business clock) and direct connection up to 40 feet. Limitation: Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6.

Prerequisites: #1603 and #3701. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection</th>
<th>Port 1</th>
<th>Port 2</th>
<th>Port 3</th>
<th>Port 4</th>
<th>Port 5</th>
<th>Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9431 #9432 #9433 #9434 #9435</td>
<td>Port 1</td>
<td>Port 2</td>
<td>Port 3</td>
<td>Port 4</td>
<td>Port 5</td>
<td>Port 6</td>
<td></td>
</tr>
</tbody>
</table>

FAC 45 - Integrated Modem - 600 or 1200 bps ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Limitation: Requires Feature Expansion Type 1 (#1520) for port positions 3, 4, 5 and 6.

Prerequisites: #1603 and #5500. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection</th>
<th>Port 1</th>
<th>Port 2</th>
<th>Port 3</th>
<th>Port 4</th>
<th>Port 5</th>
<th>Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9451 #9452 #9453 #9454 #9455</td>
<td>Port 1</td>
<td>Port 2</td>
<td>Port 3</td>
<td>Port 4</td>
<td>Port 5</td>
<td>Port 6</td>
<td></td>
</tr>
</tbody>
</table>

FAC 47 - Digital Network Interface (to AT&T Dataphone Digital Service) - 2400, 4800 or 9600 bps without business machine clock ... 4 wire point-to-point non-switched ... or multipoint non-switched. Limitation: Requires feature expansion Type 1 (#1520) for port positions 3, 4, 5 and 6.

Prerequisites: #1604 and #5600. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

<table>
<thead>
<tr>
<th>FAC Specify</th>
<th>Selection</th>
<th>Port 1</th>
<th>Port 2</th>
<th>Port 3</th>
<th>Port 4</th>
<th>Port 5</th>
<th>Port 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port #9471 #9472 #9473</td>
<td>Port 1</td>
<td>Port 2</td>
<td>Port 3</td>
<td>Port 4</td>
<td>Port 5</td>
<td>Port 6</td>
<td></td>
</tr>
</tbody>
</table>

Point-to-point or Multipoint Control

<table>
<thead>
<tr>
<th>2400 bps</th>
<th>4800 bps</th>
<th>9600 bps</th>
<th>Multipoint Trumbly</th>
</tr>
</thead>
<tbody>
<tr>
<td>9001</td>
<td>9002</td>
<td>9003</td>
<td>9004</td>
</tr>
</tbody>
</table>

--- START/STOP ---

FAC No.

<table>
<thead>
<tr>
<th>FAC Code Description</th>
<th>EIA RS-232-C</th>
<th>FAC 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>110, 134.5, 150 or 300 bps</td>
<td>(external modem)</td>
<td>(external modem)</td>
</tr>
</tbody>
</table>

NOTE: For attachment of devices that conform to 2780/3780 line protocol.

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IBM 8140 Processor

Purpose: Provides control, storage, processing capability, disk and diskette storage and device attachment capabilities for the IBM 8100 Information System.

Details:
- Model A31
  - Processor: 256K (262,144)
  - Storage: 29MB (29,327,360)
  - Non-removable Disk Capacity: None
  - Removable Disk Capacity: 64MB (65,536,064)
  - Fixed Head Disk Capacity: None

Maximum: One per 8100 Information System.

Features:
- Floating Point Arithmetic

Base Processor and Nonremovable Disk Capacity

<table>
<thead>
<tr>
<th>Model</th>
<th>Processor Storage (bytes)</th>
<th>Non Removable Capacity (million bytes)</th>
<th>Fixed Head Capacity (bytes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A31</td>
<td>256K (262,144)</td>
<td>29MB (29,327,360)</td>
<td>None</td>
</tr>
<tr>
<td>A32</td>
<td>256K (262,144)</td>
<td>23MB (23,461,688)</td>
<td>131,072</td>
</tr>
<tr>
<td>A33</td>
<td>256K (262,144)</td>
<td>54MB (56,200,192)</td>
<td>None</td>
</tr>
<tr>
<td>A34</td>
<td>256K (262,144)</td>
<td>58MB (58,654,720)</td>
<td>131,072</td>
</tr>
<tr>
<td>A41</td>
<td>320K (327,680)</td>
<td>29MB (29,327,360)</td>
<td>None*</td>
</tr>
<tr>
<td>A42</td>
<td>320K (327,680)</td>
<td>23MB (23,461,688)</td>
<td>131,072*</td>
</tr>
<tr>
<td>A43</td>
<td>320K (327,680)</td>
<td>64MB (66,520,192)</td>
<td>None*</td>
</tr>
<tr>
<td>A44</td>
<td>320K (327,680)</td>
<td>58MB (58,654,720)</td>
<td>131,072*</td>
</tr>
<tr>
<td>A51</td>
<td>512K (524,288)</td>
<td>29MB (29,327,360)</td>
<td>None</td>
</tr>
<tr>
<td>A52</td>
<td>512K (524,288)</td>
<td>23MB (23,461,688)</td>
<td>131,072</td>
</tr>
<tr>
<td>A53</td>
<td>512K (524,288)</td>
<td>54MB (56,200,192)</td>
<td>None*</td>
</tr>
<tr>
<td>A54</td>
<td>512K (524,288)</td>
<td>58MB (58,654,720)</td>
<td>131,072</td>
</tr>
</tbody>
</table>

* These models include Floating Point Arithmetic.

Highlights:
- The 8140 Processor is a multi-level, interrupt driven processor which provides control, processing capability, process storage, disk and diskette storage and communications features for the 8100 Information System. The flexibility offered by the 8140 allows the user to configure a system for initial requirements, while retaining the ability to modify the system to meet future needs.

- System control and processing is provided by machine program instructions. The 8140 mdl A41 thru A44 also includes additional instructions for supporting floating point arithmetic. Eight I/O interrupts provide for interrupt processing. The 8140 offers various amounts of processor storage of which 4,096 bytes are read only storage and not available for user programs. Processor storage can be expanded up to a maximum of 384K (393,216) for the model A31 thru 34. Fixed amounts of 320K (327,680) bytes for the model A41 thru A44 and 512K (524,288) bytes for the model A51 thru A54. Capability for dynamic addressing and storage protection for up to 4 million bytes of logical storage is also available.

- The 8140 allows for the attachment of up to four 8101 Storage and Input/Output Units two of which may be configured with Communication and Display/Printer Feature Type I or Type II, or three 8101 Storage and Input/Output Units and one 8809 Magnetic Tape Unit mdl 1A. An alternate configuration can consist of a 8140, four 8101 Storage and Input/Output Units, and one 8809 Magnetic Tape Unit mdl 1A. Up to three additional 8809 Magnetic Tape Units can be attached to the 8809 Magnetic Tape Unit mdl 1A or 1B.

- The 8140 Processor is provided with fixed high speed direct access storage. Depending on the 8140 model selected, disk storage of up to 64 million bytes with movable heads or up to 58 million bytes of fixed storage is available. The disk storage operates at a data rate of 1,031 million bytes per second. The average access time is 27 milliseconds with an average rotational delay of 9.6 milliseconds. Removable diskette storage is available with up to 1MB (985,038) of storage operating at up to 62K bytes per second data rate. The diskette drive can read/write in basic data exchange format on either the IBM Diskette 2D or the IBM Diskette Type 1.

- The 8100 System can attach to any 5/370 or 4300 Processors via the 3704/3705 for SNA/S DLC or BSC line control. The 8100 System attaches to the ICA of the 115, 125, 135 or 138 processors for BSC line control. The IBM 8100 System can attach to the Communications Adapter of the 4331 Processor for BSC and/or SDLC line control. For specific attachment see M 2700 pages.

- The capability of the 8100 Information System is further extended by providing for the attachment of a variety of input/output devices of the system. These devices may be attached to the 8140 via communications features which include data link, direct connect, and loops that are direct attached or data link attached. The number of communication ports that can be attached to the 8140 is three for the model A31 thru A34 and two for the model A41 thru A44. The 8140 mdl A51 thru A54 requires the 8101 Storage and Input/Output Unit for the attachment of communication ports.

- The capability of the processor to another, the user may relocate and/or interchange the processor from one system to another, the user must consider priority and address installation verification program.

- The flexibility offered by the processor to another, the user may relocate and/or interchange the processor from one system to another, the user must consider priority and address installation verification program.

Customer Set-Up:
- The 8140 Processor is designed as a customer set-up unit thereby offering the customer early availability and relocation flexibility. Aids and configurators are provided to facilitate the configuration and ordering of the 8140. Set-up procedures for the customer will be shipped with each machine. An 8140 installation verification program will be shipped with each machine on a diskette. A clear indication that the machine is operational will be given.

- If the user relocates and/or interchanges attaching units from one system to another, the user must consider priority and address compatibility of the processor and its attachments.

- The 8140 Processor may be shipped with each machine. An 8140 installation verification program will be shipped with each machine on a diskette. A clear indication that the machine is operational will be given.

Prequisites:
- None

Bibliography: Available at a later date.

Color: Pebble gray is the only available color.

Specify: [1] Voltage (120 VAC, 1-phase, 3-wire, 60Hz): Specify the power cable. Available at a later date.

[2] Cabling: For cabling information see Accessories pages (M10000), appropriate 8100 Information System installation manuals and Processor Site Preparation Guides.

[3] Programming Configuration: Specify the Processor model for Distributed Processing Programming Executive (DPPE), #9700 for Distributed Processing Control Executive (DPCEX), #9720 for DPDE and DPPE, or #9730 for all other configurations.

[4] Terminal Requirements: Specify the terminal type for a 3840 terminal (except when the first terminal is field replaced).

Maximum: One per 8100 System. Field installation: Yes.

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data contained in disk storage and information.

installation charges for the following model upgrades)

an RPQ.

number of communication features which can be property of

ment letters for purchase must state:

functional support as contained and described in the Functional

Diagnostics: The presence of these functional support modules. Customers ordering quantities of this feature will allow the expansion of the

of additional processor storage. The ordering of the additional

A31 thru A34 storage up to a maximum of 393.216 bytes.

One

CCITT

Provides control for

Communications without Business Machine Clock

on the 8140. Field installation: Yes.

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MULTI-SPEED CLOCK (#5200). Provides business machine clocking at 4800 bps and 9600 bps for direct connection facilities. Can provide multiple speeds simultaneously. Limitation: Not available with the 8140 mdl A31 thru A44. Maximum: One per 8140 mdl A31 thru A34 and mdl A41 thru A44. Field installation: Yes. Prerequisites: SDL Communications without Business Machine Clock (#1602), or BSC Communications without Business Machine Clock (#1604). Specify: Code as provided in FAC descriptions in the “Communication Facilities” section.

MODEM, INTEGRATED, NON-SWITCHED (#5500). Provides interface to common carrier leased facilities at 600 or 1200 bps. Limitation: Not available for Stop/Start communication facilities. Maximum: One per selected communications feature (#1601 or #1603). Field installation: Yes. Prerequisite: SDL Communications Adapter with Clock (#1601), or BSC/SS Communications with Clock (#1603). Specify: Code as provided in FAC descriptions in the “Communication Facilities” section.

MODEM, INTEGRATED, SWITCHED (#5501). Provides interface to common carrier switched facilities with auto answer at 600 or 1200 bps. Limitation: Not available with BSC and Start/Stop communication facilities. Maximum: One per selected communications feature (#1601). Field installation: Yes. Prerequisite: SDL Communications with Clock (#1601). Specify: Code as provided in FAC descriptions in the “Communication Facilities” section.

DIGITAL DATA SERVICE ADAPTER (DDSA) (#5660). Provides interface to AT&T Dataphone. Digital Service Network for transfer of digital data at speeds of 2400, 4800, 9600 in point-to-point, or multipoint configurations, or 56,000 bps in point-to-point configurations. Maximum: For speeds up to 9600 bps one per selected communications feature (#1602 or #1604). For operation at 56,000 bps one per 8140 Processor, one per 8100 System. Not available with FAC code 8, 9 or 29. Field installation: Yes. Prerequisites: SDL Communications without Clock (#1602) for operation to 56,000 or BSC Communications without Clock (#1604) for operation to 9600 bps. Specify: Code as provided in FAC descriptions in the “Communication Facilities” section.

SECURITY COVER LOCKS (#6550). This feature provides key operated security locks for the machine covers, restricting access to the machine interior and external cable connector area. See Security Lock Diskette (#6566) if diskette security is required. Additional or replacement keys are not available from IBM. Maximum: One. Field installation: Yes.

SECURITY LOCK, DISKETTE (#6566). This feature provides a key operated security lock to restrict access to the diskette magnetic media. It is accessible only by opening the front cover. For maximum security, the Security Cover Lock (#6555) must be used in addition to the diskette security lock. Additional or replacement keys are not available from IBM. Maximum: One. Field installation: Yes.

Specify Codes and FAC Code Descriptions:
A specify code number is required to identify the selected FAC code and its physical port position. The specify code is constructed by concatenating the selected FAC and its port position to the numeral 9, e.g.: #9AB where AB = FAC No. and C = Port Position.

FAC codes range in number from 08 to 61 resulting in FAC specify codes ranging in number from #9081 to #9613. Additional codes may be specified for selected options. These codes are outlined in the FAC code descriptions. No two FAC codes can occupy the same port position. Configuration Manual GAZ7-2876 will aid in assigning the port positions.

<table>
<thead>
<tr>
<th>FAC No.</th>
<th>FAC Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAC 8</td>
<td>Loop, high speed single lobe at 38,400 bps</td>
</tr>
<tr>
<td>FAC 9</td>
<td>Loop, high speed two lobes at 38,400 bps</td>
</tr>
<tr>
<td>FAC 10</td>
<td>Loop, single lobe at 9600 bps</td>
</tr>
<tr>
<td>FAC 11</td>
<td>Loop, two lobes at 9600 bps</td>
</tr>
</tbody>
</table>

By port:
- FAC 8:
  - Port #9081: Loop, high speed single lobe at 38,400 bps
  - Port #9082: Loop, high speed two lobes at 38,400 bps
  - Port #9083: Not available
- FAC 9:
  - Port #9081: Loop, high speed single lobe at 38,400 bps
  - Port #9082: Loop, high speed two lobes at 38,400 bps
  - Port #9083: Not available
- FAC 10:
  - Port #9091: Loop, single lobe at 9600 bps
  - Port #9092: Not available
- FAC 11:
  - Port #9091: Loop, single lobe at 9600 bps
  - Port #9092: Not available

NOTE: The selected option specified within a given FAC and specific port position can be changed in the field by IBM. All such changes are chargeable at the applicable FE hourly rate.

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<table>
<thead>
<tr>
<th>FAC No.</th>
<th>FAC Code Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EIA RS-232-C</td>
<td><strong>FAC 11 - Loop, Two Lobe -- Required for operating two lobe loops at 9600 bps. Prerequisites: #1602, #4830 and #4835. Specify:</strong> From the table below, specify the required codes to complete the configuration for each port selected.</td>
</tr>
<tr>
<td>Integrated Modem</td>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9101 #9102 #9103</td>
</tr>
<tr>
<td>AT&amp;T Dataphone Digital Service</td>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9111 #9112 N/A</td>
</tr>
<tr>
<td>CCITT V.35</td>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9121 #9122 #9123</td>
</tr>
<tr>
<td><strong>FAC 12 - EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock ... operating with external modem without clocking ... and point-to-point switched 2 wire ... or point-to-point non-switched 2 wire ... or multipoint 4 wire. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1601 and #3701. Specify:</strong> From the table below, specify the required codes to complete the configuration for each port selected.</td>
<td></td>
</tr>
<tr>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9151 #9152 #9153</td>
<td></td>
</tr>
<tr>
<td><strong>FAC 15 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal or 8100 System must not provide business machine clock) and direct connection up to 40 feet. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1601 and #3701. Specify:</strong> From the table below, specify the required codes to complete the configuration for each port selected.</td>
<td></td>
</tr>
<tr>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9161 #9162 #9163</td>
<td></td>
</tr>
<tr>
<td><strong>FAC 16 - EIA RS-232-C Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem (attached downstream terminal must not provide business machine clock) ... and direct connection up to 40 feet. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1602, #3701 and #5200. Specify:</strong> From the table below, specify the required codes to complete the configuration for each port selected.</td>
<td></td>
</tr>
<tr>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9171 #9172 #9173</td>
<td></td>
</tr>
<tr>
<td><strong>FAC 17 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... and direct connection up to 40 feet. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1602 and #3701. Specify:</strong> From the table below, specify the required codes to complete the configuration for each port selected.</td>
<td></td>
</tr>
<tr>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9181 #9182 #9183</td>
<td></td>
</tr>
<tr>
<td><strong>FAC 18 - Integrated Modem -- 600 or 1200 bps ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1601 and #5500. Specify:</strong> From the table below, specify the required codes to complete the configuration for each port selected.</td>
<td></td>
</tr>
<tr>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9191 #9192 #9193</td>
<td></td>
</tr>
<tr>
<td><strong>FAC 19 - Integrated Modem -- 600 or 1200 bps ... point-to-point switched with auto answer 2 wire. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites:</strong> #1601 and #5501. Specify:** From the table below, specify the required codes to complete the configuration for each port selected.</td>
<td></td>
</tr>
<tr>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9201 #9202 #9203</td>
<td></td>
</tr>
<tr>
<td><strong>FAC 20 - Digital Network Interface (to AT&amp;T Dataphone Digital Service) -- 2400, 4800, 9600 bps without business machine clock ... and 4 wire point-to-point non-switched ... or multipoint non-switched. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites:</strong> #1602 and #5660. Specify:** From the table below, specify the required codes to complete the configuration for each port selected.</td>
<td></td>
</tr>
<tr>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9211 #9212 #9213</td>
<td></td>
</tr>
<tr>
<td><strong>FAC 21 - Digital Network Interface (to AT&amp;T Dataphone Digital Service) -- 56,000 bps without business machine clock ... and point-to-point non-switched operation. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites:</strong> #1602 and #5660. Maximum: One per 8140. Maximum is one per 8100 System (not available with FAC codes 8, 9, 29). Specify:** From the table below, specify the required code to complete the configuration for each port selected.</td>
<td></td>
</tr>
<tr>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9221 #9222 #9223</td>
<td></td>
</tr>
<tr>
<td><strong>FAC 24 - CCITT V.35 Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem ... and direct connection up to 1000 feet. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites:</strong> #1601 and #5860. Specify:** From the table below, specify the required codes to complete the configuration for each port selected.</td>
<td></td>
</tr>
<tr>
<td><strong>FAC Specify</strong> Selection Port 1 Port 2 Port 3 Port #9231 #9232 #9233</td>
<td></td>
</tr>
</tbody>
</table>
FAC 27 - CCITT V.35 Interface - Up to 9600 bps without business machine clock ... operating with other 8100 System (with business machine clock)... and direct connection up to 1000 feet. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1602 and #1550. Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3
Port #9271 #9272 #9273

FAC 29 - CCITT V.35 Interface - 56,000 bps without business machine clock and external data communication equipment with clock, and point-to-point non-switched. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1602 and #1550. Maximum: One per 8140. Maximum is one per 8100 System (not available with FAC codes 8, 9 and 21). Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3
Port #9291 #9292 #9293

--- --- ---
FAC No. FAC Code Description
EIA RS-232-C
FAC 40 600 or 1200 bps (external modem)
FAC 41 Up to 9600 bps (external modem)
FAC 43 600, 1200 or 2400 bps direct connect with clock (no modem)
FAC 44 4800 or 9600 bps direct connect with clock (no modem)
Integrated Modem FAC 45 600 or 1200 bps non-switched

AT&T Dataphone Digital Service
FAC 47 2400, 4800 or 9600 bps non-switched

FAC 40 - EIA RS-232-C Interface -- 600 or 1200 bps with business machine clock ... operating with external modem with no clock ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1603 and #3701. Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3
Port #9401 #9402 #9403
600 bps 9741 9742 9743
1200 bps 9751 9752 9753

FAC 41 - EIA RS-232-C Interface -- Up to 9600 bps without business machine clock ... operating with external data communication equipment ... and point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1604 and #3701. Specify: From the table below, specify the required code to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3
Port #9411 #9412 #9413

FAC 43 - EIA RS-232-C Interface -- 600, 1200 or 2400 bps with business machine clock ... operating with no modem (downstream terminal must not provide business machine clock) and direct connection up to 40 feet. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1603 and #3701. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3
Port #9431 #9432 #9433
600 bps 9741 9742 9743
1200 bps 9751 9752 9753
2400 bps 9761 9762 9763

FAC 44 - EIA RS-232-C Interface -- 4800 or 9600 bps with business machine clock ... operating with no modem (attached downstream terminal must not provide business machine clock) ... and direct connection up to 40 feet. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1604, #3701 and #5200. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3
Port #9441 #9442 #9443
4800 bps 9771 9772 9773
9600 bps 9781 9782 9783

FAC 45 - Integrated Modem -- 600 or 1200 bps ... point-to-point non-switched 2 or 4 wire ... or multipoint non-switched 4 wire. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1603 and #5500. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3
Port #9451 #9452 #9453
2-wire 9851 9852 9853
4-wire 9861 9862 9863

FAC 47 - Digital Network Interface (to AT&T Dataphone Digital Service) -- 2400, 4800 or 9600 bps without business machine clock ... 4 wire point-to-point non-switched ... or multipoint non-switched. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1604 and #5660. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3
Port #9471 #9472 #9473
Point-to-point or Multipoint Control 2400 bps 9001 9002 9003
4800 bps 9021 9022 9023
9600 bps 9041 9042 9043
Multipoint Tributary 2400 bps 9011 9012 9013
4800 bps 9031 9032 9033
9600 bps 9051 9052 9053

--- --- ---
FAC NO. FAC Code Description
EIA RS-232-C
FAC 60 110, 134.5, 150, 300 or 600 bps (external modem)
FAC 61 110, 134.5, 150, 300 or 600 bps direct connect with clock (no modem)

FAC 60 - EIA RS-232-C Interface -- 134.5, 300, 600 bps with business machine clock ... operating with external modem ... and point-to-point non-switched facilities. See M 2700 pages for specific information on communication facilities and other attachment information.

Also 110 or 150 bps with business machine clock ... operating with external modem ... and point-to-point non-switched facilities will be provided under provisions of the IBM Multiple Supplier System Policy.

Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1603 and #3701. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify Selection Port 1 Port 2 Port 3
Port #9411 #9412 #9413

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DP Machines

8140 Processor (cont’d)

Port #9601 #9602 #9603
110 bps 9701 9702 9703
134.5 bps 9711 9712 9713
150 bps 9721 9722 9723
300 bps 9731 9732 9733
600 bps 9741 9742 9743

FAC 61 - EIA RS-232-C Interface — 110, 134.5, 150, 300, 600 bps with business machine clock ... operating with no modem (the attached terminal must provide its own business machine clock ... and direct connection up to 40 feet. Limitation: Port position three not available with 8140 mdl A41 thru A44. Prerequisites: #1603 and #3701. Specify: From the table below, specify the required codes to complete the configuration for each port selected.

FAC Specify
Selection Port 1 Port 2 Port 3
Port #9611 #9612 #9613
110 bps 9701 9702 9703
134.5 bps 9711 9712 9713
150 bps 9721 9722 9723
300 bps 9731 9732 9733
600 bps 9741 9742 9743

HOST AND TERMINAL MODEM FACILITIES

For communication facilities and modem attachment data, see the M 2700 pages and appropriate machines pages for additional information.

1200 bps integrated modem, switched and non-switched
Dataphone Digital Service Adapter
3863 Modem, switched and non-switched
3864 Modem, switched and non-switched
3865 Modem, non-switched
3872 modem, switched and non-switched
3874 modem, switched and non-switched
3875 modem, non-switched

DIRECT CONNECTION ATTACHMENT

In addition to terminal attachment to the 8100 System through common carrier facilities (see M 2700 pages) or local loops, attachment can be made by direct connect. The direct connect is made by using the SDLC (FAC 15 or 16), BSC (FAC 43 or 44) and Start/Stop (FAC 61) facilities. Shown below are the direct connect attachable devices and required device feature numbers.


FAC Code Attach Device Speeds (bps) Device Feature No.
15 3276 600, 1200, 2400 #3701, w/#9491 and #8302
16 3276 4800, 9600 #3701, w/#9491 and #3802
15 3767 600, 1200, 2400 #3718 w/#9707, #9533
61 2741 134.5 #9115 or #9120
15, 24 8130/8140/8101 600, 1200, 2400 #3701 (FAC 17) or #1550 (FAC 27) and #1602
8775-11, 12 600, 1200, 2400 #3701 (FAC 15) or #1550 (FAC 24)
16, 25 8130/8140 4800, 9600 #3701 (FAC 17) or #1550 (FAC 27) and #1602
8775-11, 12 4800, 9600 #3701 (FAC 16) or #1550 (FAC 25)
43 2780/3780 600, 1200, 2400 Refer to specific device
Protocol See Note 3
44 2780/3780 Line Protocol 4800, 9600 Refer to specific device
See Note 3

NOTE 3: For attachment of devices that conform to 2780/3780 protocol.

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IBM 8775 DISPLAY TERMINAL

Purpose: A high function cathode ray tube display terminal which provides a means of entering data to or receiving data from the 8100 System. Extended highlighting, multipoint and extended data entry capabilities are available. A keyboard or a Selector Light Pen permit an operator to display and manipulate data on the screen in a flexible and efficient manner. Other functions include Audible Alarm, Security Keylock and Magnetic Slot Reader. The 8775 meets both general and unique display requirements with its set of basic and optional features.

MODELS - Loop Attach

Model 1 Displays 960, 1920 or 2560 characters in the 9x16 character matrix size
Model 2 Displays 960, 1920, or 2560 characters in the 9x16 character matrix size or 3440 characters in the 9x12 character matrix size

MODELS - SNA/SDLC Data Link Attach over Communication Facilities

Model 11 Displays 960, 1920 or 2560 characters in a 9x16 character matrix size.
Model 12 Displays 960, 1920, 2560 characters in the 9x16 character matrix size or 3440 characters in the 9x12 character matrix size.

The 8775 Display Terminal communicates with an 8130 or 8140 processor using Synchronous Data Link Control (SDLC) over either direct or data link attach loops or via data link attach over communication facilities. The basic 8775 offers equivalent function and is upward data stream compatible with the 3276/3278.

Highlights: Displays 960, 1920 or 2560 characters in a 9x16 character matrix, or 3440 characters in a 9x12 character matrix (models 2 and 12 only).

The number of characters displayed is determined under operator control. All configurations include 62 alphanumeric and 32 special characters, the Space, and Null characters. Use of 3270 Field Formatting capability permits individual fields of data on the screen to be program defined with various attributes such as protected/unprotected, alphanumeric/numeric, normal/highlighted intensity, displayable/non-displayable, and selector light pen detection allowed/disallowed.

Enhanced function, which includes APL, extended highlighting, multiple partitions and field validation, is offered as a new feature.

Operator Factors: The 8775 has an anti-reflective screen. Indicators are displayed on the bottom row of the screen, outside the data display area, and provide useful operator information. Updating the screen from the host is accomplished without refresh interrupt (i.e., no blinking). The keyboard, which is low in profile, provides a palm rest area and has separators to help prevent accidental striking of control keys. The operator may select one of several cursor modes.

Editing Facilities: Cursor move, tab, home key, back tab, insert, delete, extended erase (erase to end-field, erase all keyboard input data, and erase entire screen) and cursor select keys are all basic. All alphanumeric, special symbol, and cursor move keys have typematic capability. Doubly speed cursor typematic is attained with a simultaneous depressing of the ALT key and a horizontal cursor positioning key. The cursor select function provides an alternative to the selector light pen function. Fields of data may be selected by positioning the cursor then using the cursor select key.

Input Flexibility: A choice of keyboards or the selector light pen provide input flexibility. See "Special Features" below.

Security Facilities: A special non-displayed input mode provides for fields of data to be program-defined so that they will accept data entered from the keyboard without displaying the data on the screen. A Security Keylock (optional) prevents modification or display of data in the display buffer unless the key is turned to the "on" position. The Set Up Keylock (optional) controls access via the keyboard to change the terminal address. Those capabilities and the terminal's ability to identify itself to the host program, allow customer-supplied security program routines to control access to data and to record an audit of actions. A Magnetic Slot Reader is available to enter system user identification.

Communications: 8775 display terminals are attached to customer-owned loops or data link attached to an 8100 Information System. A direct loop to an 8100 System processor may operate at 34.8K bps, or 9600 bps, this operating speed being determined by the customer at order time. A data link attached loop operating at 2400 bps (1200 bps half-speed option) may be connected to the 8100 System via the 3842 Loop Control Unit and the 3872 Modem. The 3842 can be connected multipoint or point-to-point on a leased transmission facility to a 3872 modem at the 8100 System site of operation.

The 8775 may communicate to an 8100 Information System using Synchronous Data Link Control (SDLC) transmission over data link non-switched communication facilities.

Communication Facilities: The 8775 operates in data half duplex mode over non-switched facilities in 2 or 4 wire point to point or 4 wire multipoint configurations at transmission speeds of 1200/600, 2000/1200, 4800/2400, 7200/3600, and 9600 bps on non-switched facilities D3, D5, D4, D4M, D5, D5M, D6, D6M, D7M, X1, X1M, X2, X2M, X3, X3M. Refer to the M 2700 pages.

Modems: A 1200 bps integrated modem feature (#5500) or an external IBM modem may be attached to an 8775. External modems require the External Modem Interface (#5701).

MODEMS

3872 modl 1 -- 2400/1200
3874 modl 1 -- 4800/2400
3875 modl 1 -- 7200/3600

For communication capabilities, product utilization and special features see the M 2700 pages and appropriate modem pages for additional information.

Problem Determination Procedures: Significant function has been designed into this unit to provide greater availability to the customer. This has been done through the use of the problem determination and recovery routines and procedures that are easily understood and used by the operator. See "Customer Responsibility" below.

Customer Setup (CSU): The 8775 is designated Customer Setup, thereby offering customers ease of set up and relocation capability.

Customer Responsibility: The customer is responsible for:

- Adequate site, system and other vendor preparation.
- Receipt at customer's receiving dock, unpacking and placement of 8775 display terminal.
- Physical set up, connection of cables incorporating protected customer access areas, and checkout.
- Contact Field Engineering to make cable connections of IBM CSU units to non-CSU units where customer access area is not provided.
- Notify IBM of intent to relocate and follow IBM instructions for relocation.
- Use and follow the problem determination procedures and fill out trouble report prior to calling for IBM service.
- Disconnecting, packing and removal to the customer's shipping dock at time of discontinuance; appropriate instructions will be provided by IBM.

Bibliography: Refer to An Introduction to the IBM 8775 Display Terminal, GC33-3040.

Specify: [1] Voltage (120V AC, 1-phase, 3-wire, 60Hz): #9880 for locking plug, or #9891 for non-lock plug. If standard 2.8 meter (9 foot) power cable is not desired, specify #9511 for 1.8 meter (6 foot) cable, #9512 for 3.7 meter (12 foot) cable, or #9513 for 4.5 meter (15 foot) cable.

[2] Attachment: Specify the following:
#9221 - for attachment to the 8130 Processor
#9222 - for attachment to the 8140 Processor.

[3] Distribution of Magnetic Media for Enhanced Function Feature (#3624) or Multiple Partitions and Scrolling (#5110). Specify:
#9491 - for one 8775 on each 8100 system.
#9492 - for all other 8775s on each 8100 system.

Note: For each 8100 System with one or more 8775s with #3624 or #5110 attached, one and only one 8775 should specify #9491. Care should be exercised when relocating 8775s that this relationship is maintained.

If #9491 is specified also select #9425 Diskette 2B to identify the type of magnetic media. Additional shipping instructions are also required.

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Whenever the Enhanced Function Feature (#3624) or Multiple Partitions and Scrolling (#5110) is updated by an EBCDIC character set, the data is updated by the computer. The operator must enter the data into the next-to-last position on the screen. The operator must enter the data into a terminal designated by specific codes.

All 8775s with #3624 or #5110 are attached to a system which is assigned a TPC (Teleprocessing Control Number). This TPC identifies a network associated with an IBM System or a central site facility. The TPC is a six character code. TPC is assigned subsequent to delivery of the 8775 when the machine serial number is known.

Communication Cable: A 1.8 meter (6 foot) communication cable is provided for attachment to a direct or data link attached loop. If the 1.8 meter cable is not desired, specify #9405 for a 4.5 meter (14 foot) cable. A 6.1 meter (20 foot) communication cable is provided as standard for attachment to standalone modes or to the communication facility when an integrated modem is used or to the communication facility when a DDS adapter is used. If the standard communication cable is not desired, specify #9061 for 3.0 meter (10 foot) cable, #9062 for 5.1 meter (17 foot) cable or #9063 for 12.2 meter (40 foot) cable. Use the CCITT V35 Interface (#1550) feature, a 3.0 meter (10 foot) cable is supplied.

Character Set: #9082 for EBCDIC Character Set -- used in conjunction with 75-key Typewriter Keyboard or Data Entry Keyboard or 87-key EBCDIC Typewriter Keyboard.

PRICES: Mdl MRC 2 yr Purchase AMMC/ MLC
8775 1 74 $ 63 $2,835 $ 19
2 63 71 3,195 19
11 89 68 2,955 21
12 89 76 3,295 23


Model Changes: Yes, as shown below. Field installation: Yes.

MODEL UPGRADE PURCHASE PRICE (there are no additional installation charges)

From Model 1 to Model 2 .... $650
From Model 11 to Model 12 .... $659

SPECIAL FEATURES

SET UP KEYLOCK (#1009). Controls access to change the unit address of the terminal. Maximum: One. Field installation: Yes.

AUDIBLE ALARM (#1090). An alarm sounded under program control to alert the operator to a special condition. This alarm, during keyboard operation, is also sounded when a character is entered into the next-to-last position on the screen. The operator may adjust the volume of the tone. Maximum: One. Field installation: Yes.

BUSINESS MACHINE CLOCKING (#1488). Required for attachment of IBM 1200 bps Integrated Modem feature (#5300) or any external modem that does not provide its own clocking and operates at 1200/600 bps. Maximum: One. Field installation: Yes.

FEATURE STORAGE (#3622). Provides the storage capacity required for the Enhanced Function and Multiple Partitions and Scrolling feature (#5110). Maximum: One. Field installation: Yes. Note: The Enhanced Function Feature and Multiple Partitions and Scrolling consist of two sets of data contained on magnetic media. Either set but not both can be loaded into the 8775 via the SI00 system at a given time. Refer to "Specify" for information on the shipment of the magnetic media to the proper location.

ENHANCED FUNCTION FEATURE (#3624). Provides the ability to display APL characters, to highlight data, display data in user-defined partitions and to validate data fields as they are entered into the display terminal from the operator keyboard. Highlight is on a per character basis in one of three user selectable modes, blink, reverse video or underscore, and, additionally, on a field basis for intensity. Partitioning provides the ability to display data in up to eight user defined rectangular partitions and for the host or user to interact individually with the data within each partition. APL provides the ability to display data in the display area and the unique characters consisting of 94 EBCDIC, 81 APL specific, 37 characters unique to 3270 text and 10 new graphic characters.

Validation provides:
Mandatory Enter - Data must be entered into this field to permit entry to the host.
Mandatory Fill - All positions in this field must be filled to permit entry to the host.
Trigger Field - Causes the contents of the field to be sent from the display when data has been entered into the field and the cursor leaves the field.

Maximum: One. Field installation: Yes. Prerequisites: Feature Storage (#3622), Feature Adapter (#3905). If APL is used, 87-key APL Typewriter Keyboard (#4626) is required. If keyboard selectable highlighting is desired, 87-key keyboards (#4625 or #4627) are required.

FEATURE ADAPTER (#3905). Provides the logic and control necessary to perform the enhanced function. Maximum: One. Field installation: Yes. Prerequisites: Feature Storage (#3622) or Enhanced Function (#3624).

KEYBOARDS

#4621 -- 75-key Typewriter Keyboard, typewriter-like layout, movable, with 49 data keys and 26 control keys. Twelve program function keys are included in the top row of data keys through use of an alternate shift key. Prerequisite: EBCDIC Character Set (#9082).

#4622 -- 75-key Data Entry Keyboard, movable with 35 data keys, 10 program function keys and 30 control keys. Prerequisite: EBCDIC Character Set (#9082).

#4623 -- 75-key Data Entry Keyboard, keypunch layout, movable, with 35 data keys, 10 program function keys and 30 control keys. This is the recommended keyboard for high volume data entry. Prerequisite: EBCDIC Character Set (#9082).

#4625 -- 87-key EBCDIC Typewriter/APL keyboard, an 87-key EBCDIC typewriter keyboard (ref #4627) with modified keytops to allow entry of 81 APL specific characters in addition to the 94-characters EBCDIC set. An APL On/Off key provides whether the keyboard is in basic EBCDIC typewriter or APL mode. In contrast to the 87-key EBCDIC typewriter keyboard without APL (ref. #4627), this keyboard has only twelve program function keys (PF1 thru PF12) which are the group of twelve keys to the right of the main keyboard area. Prerequisites: Enhanced Function Feature (#3624), EBCDIC Character Set (#9082).

#4627 -- 87-key EBCDIC Typewriter Keyboard, typewriter-like layout, movable, with 49 alphanumeric data keys, 26 control keys and 12 program function keys (24 total PF keys). Twelve of the program function keys are included in the top row of the data keys through the use of an alternate shift key. Prerequisite: EBCDIC Character Set (#9082).

Maximum: One of the above keyboards. Field installation: Yes. The keyboard is set up by the customer. Specify if 0.9 meter (3 foot) keyboard cable is not desired, specify #9399 for 1.8 meter (6 foot) cable. Limitation: Keyboards used on 3275/3276/3277/3278 machines are not interchangeable with keyboards used on 8775 machines.

KEYBOARD NUMERIC LOCK (#4600). Provides the ability to lock the keyboard if a non-numeric key (other than 0-9, minus (-), decimal sign, or dup) is depressed in a predefined numeric-only mode. Maximum: One. Field installation: Yes.

ATTACHMENT FEATURE (#M1 or #2). Each 8775 must be equipped with a loop adapter which provides the capability to attach to a direct or data link attached loop of the 8100 System.

LOOP ADAPTER (#4650). Provides the capability to attach to a direct or data link attached loop of the 8100 System. Direct loop may operate at a data rate of 38.4K bps or 9600 bps. The data link attached loop operates at a data rate of 2400 bps with a half-speed option of 1200 bps. Operating speed of 38.4K, 9.6K, or 2.4K is determined by the customer at order time, half-speed of 1200 bps can be selected by the operator. Data link adapters are connected via 3842 Loop Control Unit. Specify: On initial order or by change by service representative.

MONOCASE SWITCH (#4944). Provides the choice to display either uppercase characters only or both uppercase and lowercase characters. Maximum: One. Field installation: Yes.

MAGNETIC READER CONTROL (#4999). Provides the capability of attaching a Magnetic Slot Reader which reads encoded information (numeric only) from a magnetic stripe. Maximum: One. Field installation: Yes.
MULTIPLE PARTITIONS AND SCROLLING (#5110). Multiple partitions provide the ability to display data in up to eight user-defined rectangular partitions and for the host or user to interact individually with data within each partition. Scrolling provides the ability with any designated partition for user interaction with a data record longer than provided for by the physical size of the visible portion of that partition. The operator controls the movement of data either up or down through the use of Scrolling control keys located on the keyboard. An additional scrolling buffer of a maximum of 58 lines of 80 characters to a line (#4640 characters) is provided. The actual scrolling capability is dependent upon screen/partition configuration. Maximum: One. Field Installation: Yes. Prerequisite: Feature Storage (#3622).

SECURITY KEYLOCK (#6340). A lock and key which prevents modification or display of data in the display terminal when in the "OFF" position. Maximum: One. Field Installation: Yes.

SELECTOR LIGHT PEN (#6350). A hand-held, pen-like device which permits the operator to select fields of data from a display for input into the host system. The Selector Light Pen, while not be battery-powered, can be used to keep track of the position of the keyboard used for an item's incident items. Selector Pen (and Cursor Select) operations include a new designator character "&". When this designator is used, the Read Modified operation results in the return of both the addresses and the data of all modified fields on the screen. Maximum: One. Field installation: Yes.

Telecommunication Features

Each 8775 mill 11 or 12 must be equipped with one of the following communication features: CCITT V35 Interface (#1550), External Modem Interface (#3701), 1200bps Integrated Modem (#5500), DDS Adapter (#5650 or #5651). CCITT V35 INTERFACE (#1550). Provides a CCITT V35 interface for direct connection up to 1000 feet operating without a modem. Speeds of 600, 1200, 2400, 4800 and 9600 bps are supported. Business Machine Clocking (#1488) is not required. Maximum: One. Field Installation: Yes on mill 11 and 12. Limitation: Cannot be installed with #3701, #4850, #5500, #5650 or #5651.

EXTERNAL MODERN INTERFACE (#3701). Provides an EIA RS-232C interface and appropriate code to attach either an external IBM modem or PTT mandatory modem. Refer to M 2700 pages. Other external non-IBM modems may be attached subject to the multiple system supplier bulletin. Provides interface to Data Service Unit for attachment at AT & T Dataphone Digital Service. Supports speeds of 600, 1200, 2400, 4800 and 9600 bps. Also supports direct connection up to a distance of 40 feet at speeds of 600, 1200, 2400, 4800, 9600 bps. Business Machine Clocking (#1488) is not required. Maximum: One. Field Installation: Yes on mill 11 and 12. Prerequisite: Business Machine Clocking (#1488) required for those modems which do not provide their own clocking. Limitation: Cannot be installed with: #1550, #4850, #5500, #5650 or #5651.

IBM 1200 BPS INTEGRATED MODERN NON-SWITCHED (#5500). Provides an integrated modem at speeds of 1200/600 bps for operation over non-switched communication facilities. No external modem is required. Speeds: 1200, 2400, 4800, 7200 and 9600 bps. Also supports direct connection up to a distance of 40 feet at speeds of 600, 1200, 2400, 4800, 9600 bps. Business Machine Clocking (#1488) is not required. Maximum: One. Field Installation: Yes on mill 11 and 12. Limitation: Cannot be installed with #1550, #3701, #4850, #5500, #5650 or #5651. Prerequisite: Business Machine Clocking (#1488).

DDS ADAPTER (#5650 for point to point operation; #5651 for multi-point tributary operation). An adapter for SDLT data transmission at speeds of 2400, 4800 or 9600 bps over the AT & T non-switched Dataphone Digital Service Network. The DDS Adapter interfaces to a DDS channel service unit, the customer side termination of the DDS network. Specify: #8922 for 2400 bps...#8923 for 4800 bps...#8925 for 9600 bps. Maximum: One #5650 or #5651. Field Installation: Yes on mill 11 and 12. Limitation: Cannot be installed with #1550, #3701, #4850, #5650 or #5651.

Special Feature Prices:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up Keylock</td>
<td>$1009</td>
</tr>
<tr>
<td>Audible Alarm</td>
<td>$1090</td>
</tr>
<tr>
<td>Business Machine Clock</td>
<td>$1488</td>
</tr>
<tr>
<td>CCITT V35 Interface</td>
<td>$1710</td>
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<tr>
<td>Feature Storage</td>
<td>$3622</td>
</tr>
<tr>
<td>Enhanced Function</td>
<td>$3624</td>
</tr>
<tr>
<td>External Modem Interface</td>
<td>$3701</td>
</tr>
<tr>
<td>Feature Adapter</td>
<td>$3905</td>
</tr>
<tr>
<td>Keyboard</td>
<td></td>
</tr>
<tr>
<td>75-key Typewriter</td>
<td>$4621</td>
</tr>
<tr>
<td>75-key Data Entry</td>
<td>$4622</td>
</tr>
<tr>
<td>75-key Data Entry (Kipunch Layout)</td>
<td>$4623</td>
</tr>
<tr>
<td>87-key Typewriter/ APL</td>
<td>$4626</td>
</tr>
<tr>
<td>97-key Typewriter</td>
<td>$4627</td>
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<tr>
<td>Keyboard Select</td>
<td>$4890</td>
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<tr>
<td>Loop Adapter</td>
<td>$4850</td>
</tr>
<tr>
<td>Monocase Switch</td>
<td>$4944</td>
</tr>
<tr>
<td>Mag Reader Control</td>
<td>$4999</td>
</tr>
<tr>
<td>Multi Partitions &amp; Scroll</td>
<td>$5110</td>
</tr>
<tr>
<td>1200 bps Int Modem</td>
<td></td>
</tr>
<tr>
<td>Non-switched</td>
<td></td>
</tr>
<tr>
<td>DDSA - Pt to Pt</td>
<td>$5650</td>
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<tr>
<td>DDSA - Multi Tributary</td>
<td>$5651</td>
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<tr>
<td>Security Keylock</td>
<td>$6340</td>
</tr>
<tr>
<td>Selector Light Pen</td>
<td>$6350</td>
</tr>
</tbody>
</table>

ACCESSORIES

The following are available on a purchase only basis. Order the Part No. indicated below at the price listed in the M10000 pages.

MAGNETIC SLOT READER (Part No. 4123500) -- a free-standing Magnetic Slot Reader (MSR) that reads encoded information from a magnetic stripe. It attaches by a 1.5 meter cable through the Magnetic Reader Control (#4999). The MSR has 3 lights and a buzzer which provide feedback to the user on the status of the read data. The MSR accommodates a wide range of magnetic stripe plastic cards such as: ID badges, security operator identification cards, etc. These cards can be encoded with numeric only up to 40 characters at 75 bits per inch, or up to 65 characters at 127 bits per inch.

Note: Magnetic cards coded with the Alternate End of Message character (hexadecimal "C") cannot be read by this reader. The MSR cannot be used to log on to an SNA network. Maximum: One. Limitation: Valid for numeric only. Prerequisite: Magnetic Reader Control (#4999).

MERCURY BATTERY (Part No. 1743456) -- provides power to maintain critical information while the terminal is powered off. This supply item is a 4.14 volt non-rechargeable mercury battery. This battery has a shelf life of 1 year under normal conditions and can be expected to provide 3.5 years of normal operation. One battery is supplied at no additional charge with the initial order. Discharged batteries should be returned to IBM for disposal. Field Installation: Yes, by customer.

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**IBM 8809 Magnetic Tape Unit**

**Purpose:** Magnetic tape unit for the 4331 Processor and the 8100 Information System. Provides high speed save/restore capability for fixed DASD as well as satisfying the DB/DC journaling, tape interchange and processing of the using system.

**Model 1A**
First drive which attaches to the 8101 Storage and I/O Unit or to the 8809 Magnetic Tape Unit Adapter on the 4331 Processor.

**Model 1B**
First drive which attaches to the 8130 or 8140 Processor.

**Model 2**
Second or fourth drive which attaches to the first (Model 1A or 1B), third drive (Model 3), or fifth drive (Model 3), respectively.

**Model 3**
Third drive or fifth drive which attaches to a Model 2.

**Model Changes:** Available at time of manufacture only.

**HIGHLIGHTS**
The 8809 Magnetic Tape Unit transports tape directly from reel to reel without capstans or vacuum columns, with tape tension and velocity controlled electronically.

The 8809 will operate in one of two operating modes selectable by the host processor. The first mode is start/stop mode, in which the 8809 operates at 3.175 meters per second (12.5 inches per second) to achieve a 20,000 bytes per second instantaneous data rate. The second mode is streaming mode in which the 8809 operates at 2.54 meters per second (100 inches per second) to achieve a 160,000 bytes per second instantaneous data rate for volume dumps.

Tapes written in either start/stop or streaming mode have an identical tape format. This 63 bytes per millimeter (1600 bytes per inch) phase encoded tape format permits the compatible interchange of tapes with IBM 2400 and IBM 3400 tape subsystems operating with the same recording format and density.

**Note:** The 8100 Information System will require dedicated operation to achieve streaming mode for save/restore volume dumps. The 4331 Processor may require dedicated operation and/or selection of the long gap (30.5mm or 1.2') mode in order to achieve acceptable performance in streaming mode.

**Checking:** Each byte is partly checked while tape is being read. Data written on tape is read back and checked as in reading, with full parity check.

**Error Correction:** Single track error correction "in flight" takes place similar to other IBM tape products in 63bpmm (1600bpi) phase encoded mode during read operations.

**Specifications**
- **Voltage (AC, 1-phase, 3 wire, 60Hz):** 
  - Mdl 1B: #9911 for 120V, #9902 for 208V, or #9914 for 240V.

- **8100 System Attachment:** 
  - 4331 Processor Attachment: #9907.

- **Color (4331 Processor only):**
  - #9060 for Willow Green
  - #9061 for Garnet Rose
  - #9062 for Sunrise Yellow
  - #9063 for Classic Blue
  - #9064 for Charcoal Brown
  - #9065 for Pebble Grey

**PRICES:**

<table>
<thead>
<tr>
<th>Model</th>
<th>MRC 2 Yr</th>
<th>Purchase</th>
<th>MMMC/AMMC/R</th>
</tr>
</thead>
<tbody>
<tr>
<td>8809 1A</td>
<td>$341</td>
<td>$290</td>
<td>$10,440</td>
</tr>
<tr>
<td>1B</td>
<td>417</td>
<td>355</td>
<td>12,790</td>
</tr>
<tr>
<td>2</td>
<td>303</td>
<td>258</td>
<td>9,270</td>
</tr>
<tr>
<td>3</td>
<td>341</td>
<td>290</td>
<td>10,440</td>
</tr>
</tbody>
</table>

**Plan Offering:**
Plan D Purchase Option: 55% Per Call: 1  
Machine Group: D  
Warranty: B  
Useful Life Category: 2  
Termination Charge Months: S  
Termination Charge Percent: 25  
Initial Period of Maintenance Service: 3 mos.  
Upper Limit Percent: 5%  

**SPECIAL FEATURES**
- **8100 System Multi-Drive Feature (#4920):** Required on a mdl 1B if more than one tape drive (additional mdl 2 or mdl 3) is attached to an 8100 System.
- **Special Feature Prices:** MRC 2 YR Purchase

**IBM 8809 Magnetic Tape Unit Introduction, GA26-1659.**

**IBM 8100 Information System Installation Manual - Physical Planning, GA27-2877.**

**IBM 8100 Information System Configuration, GA27-2876.**

**IBM 8100 System Multi-Drive System/360, System/370, and 4300 Processors, GC22-7064.**

**Bibliography:**
- Tape Specifications for IBM One-Half Inch Tape Units at: 556, 800, 1600, and 6250 BPI, GA32-006-5.  
- IBM 8809 Magnetic Tape Unit Introduction, GA26-1659.

**IBM 8809 Magnetic Tape Unit Transport:**
- IBM 8100 System Multi-Drive System/360, System/370, and 4300 Processors, GC22-7064.
ENDORSER PLATES

The Endorser Plate is made to the customer's specifications. An additional charge is made for an endorser plate that requires art and layout work which cannot be accomplished by straight line type setting. This additional charge applies to single plate orders and the first plate of multiple plate orders. Documents can be endorsed with date, identification number and the bank's legal endorsement.

It is recommended that the customer stock at least one spare endorser plate for each group of machines with identical plates, since plates cannot be immediately replaced.

Feature | Purchase | FIC*
--- | --- | ---
For 802 or 803 — no artwork required | #3792 | $48
For 1201 — no artwork required | 3792 | $48
For 1203 or 1260, w Serial Numbering/Endorsing (#3791) — no artwork req'd | 3792 | $5
For 1203 (old style plate) — no artwork required (Field Installation Only) | 3794 | $5
For 1210, 1219, 1241, 1412, 1419 or 1421 — no artwork required | 3792 | $77
*** Art and layout work, if required for any of the above — Additional Charge | 3796 | $35
Blank Endorser Plate (Plant Installation Only) | 3793 | No Charge

* FIC applies to field installation on both rental and purchase machines.
** Not applicable.
*** Artwork for old style 1203 Endorser Plate cannot be used for the Serial Numbering/Endorsing Plate. If artwork is required, the charge for #3796 will apply.
**** Service Charge.

Replacement: Mechanical and Capacity Replacement Machines: 801, 802, 803 or 1201 replaced by 803 or 1201 ... 1203 replaced by 1203 ... 1260 replaced by 1260 ... 1210, 1219, 1241, 1412, 1419 or 1421 replaced by 1419 — a replacement endorser plate will be shipped with each replacement machine at no charge when the machine being replaced has an endorser. If any change in plate design is desired, there is a charge only for art and layout work (#3796), if applicable. The endorser plate on a displaced machine is to be left with the machine, but defaced and rendered unusable.

Installed Machines: The normal plate charge will apply whenever replacement of a worn or damaged plate is required. Charges for art and layout work are to be added, if applicable. Note: Endorser plates are interchangeable only within the group of machines listed on each line under "Prices."

Specify: [1] For shipment with machine, order #3792 or #3793. For field installation, order #3792 ... for old style 1203 plate, order #3794. In all cases, if art and layout work is required for #3792 or #3794, also order #3796.
[2] If #3792 is ordered on several machines, for shipment with machines, or if #3792 or #3794 is ordered for field installation, a completed Endorser Plate Specification Sheet must be forwarded for each machine. If available, a sample endorsement should be attached to each Spec Sheet.
[3] For a mechanical or replacement machine, order Endorser Plate (#9140) at no charge. If any change in plate design is desired, the charge for art and layout work (#3796) is to be added if applicable. Attach sample endorsement to the Endorser Plate Spec Sheet and forward to the plant.
[4] When ordering #3792, #3793 or #9140 for shipment with a machine, specify color of ink to be used — #9145 for black, #9146 for green, #9147 for purple, or #9148 for red.

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## ACCESSORIES

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
<th>MMMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORMS STAND</td>
<td>Permits placement of continuous forms (out of carton) on stand above floor level and provides for stacking after printing. This accessory is a two-shelf forms stand.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For 2213, 3284, 3286, 3287, 3645, 3713, 3735, 3767, 3771, 3773, 3774, 3784, 3791, 3792</td>
<td>#4450</td>
<td>$7/</td>
<td>NC</td>
</tr>
<tr>
<td>For 2152</td>
<td>4450</td>
<td>61</td>
<td>NC</td>
</tr>
<tr>
<td>For 5213</td>
<td>4450</td>
<td>50</td>
<td>NC</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For 3286, 3610, 3612, 3615, 3618, 3775 †††</td>
<td>#4450</td>
<td>$54</td>
<td>NC</td>
</tr>
<tr>
<td>Paid on the 3775 it is recommended that forms be used out of carton.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FORMS GUIDE/ROLL PAPER HOLDER (for 3735)</td>
<td>Provides guide for continuous forms or for mounting rolls of paper. Includes a tear bar. Order Part No. 1858553.</td>
<td>$65</td>
<td>TM</td>
</tr>
<tr>
<td>LONG FORMS STACKER GUIDES (for 3211)</td>
<td>Useful on 3211 when it is required to print on forms having a fanfold depth greater than 18&quot;. One guide supports the paper supply stack and the other extends the stacking area to accommodate the long folds. The rear stacker guide prevents automatic operation of the power stacker folding belts only when in use. Order Part No. 2471661.</td>
<td>365</td>
<td>NC</td>
</tr>
<tr>
<td>†† ILLUMINATING LAMP (802/803)</td>
<td>Bulbs are not included. order #4610.</td>
<td>42</td>
<td>NC</td>
</tr>
<tr>
<td>†† ROLL PAPER HOLDER (for 2740 or 2741)</td>
<td>Provides for mounting of rolls of paper or continuous forms. Includes a tear bar and forms guide. Order Part No. 1186101.</td>
<td>65</td>
<td>TM</td>
</tr>
<tr>
<td>STACKER FOR 1403 (For use with Selective Tape Listing Feature)</td>
<td>Used by 1403s equipped with Selective Tape Listing Feature (#6410, 6411) for orderly stacking of both selective listing tapes and fold pack paper. It is mounted on the back of the printer directly beneath the present stacker rolls. The pocket separators can be moved to obtain 4 to 8 pockets which will stack 3.1&quot; or 1.5&quot; width paper respectively. Combinations of 3.1&quot; and 1.5&quot; width papers can be processed on the same run. Each pocket holds approximately 1,000' of fanfold paper, or 20' of selective listing tapes. The stacker contains its own motor which drives the stacker roll shaft. When the Selective Tape Listing Feature is not in use, the stacker can be easily removed. Order #6413</td>
<td>350.00</td>
<td>TM</td>
</tr>
</tbody>
</table>

† If shipped prior to June 1, 1963 on a Single Use-Charge basis, may be retained by rental customers at any time in the future if they so desire. Where shipped on or after June 1, 1963, the items are to be removed when rental machines are discontinued.

†† If ordered on a Single Use-Charge basis prior to August 6, 1973, may be retained by rental customers at any time in the future if they so desire. Upon machine discontinuance, if a customer does not desire to retain roll paper holder, it is to be returned with the machine. If ordered on a purchase basis, the roll paper holder remains the property of the customer and is to be removed when a rental machine is discontinued.

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CABLES

Cables and or associated parts to attach the subject machines to the 3271/3272 Control Units and 3276 Control Unit Display Stations may be purchased from a customer selected source. For the proper identification, installation, and application of the subject cable and parts, see IBM 3270 Installation Manual - Physical Planning, GA27-2787. The customer is responsible for installation and maintenance of these cables and their associated parts.

**Purchase Price**

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Maximum Length</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSM 1563155</td>
<td>Loop Cable Assembly</td>
<td>609.6m (2000')</td>
<td></td>
</tr>
<tr>
<td>ASSM 1741556</td>
<td>Cable Assy (joining 2 telephone lines)</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>ASSM 1745348</td>
<td>Cable Assy (3603 to Loop Terminal Box)</td>
<td>7.62m (25')</td>
<td></td>
</tr>
<tr>
<td>ASSM 1745372</td>
<td>Cable Assy (Loop Repeater to Loop Terminal Box)</td>
<td>7.62m (25')</td>
<td></td>
</tr>
<tr>
<td>ASSM 1745349</td>
<td>Cable Assy (DDA to 3603)</td>
<td>7.62m (25')</td>
<td></td>
</tr>
<tr>
<td>ASSM 1745350</td>
<td>Cable Assy (3603 to Leased Lines)</td>
<td>7.62m (25')</td>
<td></td>
</tr>
<tr>
<td>BULK 5252769</td>
<td>Bulk Cable (2 Connector)</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>BULK 5252913</td>
<td>Bulk Cable (4 Connector)</td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td>PART 1561344</td>
<td>Strain Relief</td>
<td></td>
<td>$1.10</td>
</tr>
<tr>
<td>PART 1745363</td>
<td>Connector Assembly (3603)</td>
<td></td>
<td>18.00</td>
</tr>
<tr>
<td>PART 5252765</td>
<td>Male Plug</td>
<td></td>
<td>2.75</td>
</tr>
<tr>
<td>PART 5252766</td>
<td>Female Plug</td>
<td></td>
<td>4.00</td>
</tr>
<tr>
<td>PART 5420242</td>
<td>Mini-Ty (used with 1745363)</td>
<td></td>
<td>.05</td>
</tr>
</tbody>
</table>

**CABLES (3600)**

Cables to attach 3600 units may be purchased from IBM or a customer-selected source ... see Physical Planning Manual GA27-2766 for cable and connector specifications. The customer is responsible for installation and maintenance of these cables. Assembled cables may be purchased from IBM at the prices shown below. Order specify bulk cable number, cable assembly number or part number as appropriate.

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Description</th>
<th>Maximum Length</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5165886</td>
<td>Price per Foot</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CABLES (3650, 3660, 3680)**

Bulk loop cable to attach 3650, 3660 or 3680 units may be purchased from IBM or a customer selected source ... see Physical Planning Manual, GA27-3074, or 3680 Site Planning Guide for bulk loop specifications. The customer is responsible for installation and maintenance of these cables. The bulk cable may be purchased from IBM at the price shown below. Order specify bulk cable number and number of feet desired.

<table>
<thead>
<tr>
<th>Bulk Cable No.</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5165886</td>
<td>Price per Foot</td>
</tr>
</tbody>
</table>

**CABLES (3790) (3790)**

Cables to attach 3730 and 3790 units may be purchased from IBM or a customer selected source, specifications and usage. The customer is responsible for installation and maintenance of these cables. Coaxial cables, connections and accessories for the 3277 and 3288 are applicable when these parts are attached to the 3790 system. Refer to 3270 Cable Accessory section for prices and part numbers.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Cable Asm No.</th>
<th>Use</th>
<th>Maximum Length</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3791</td>
<td>156445 (P/N)</td>
<td>Connector Group</td>
<td>$81.85</td>
<td></td>
</tr>
<tr>
<td>3792</td>
<td>1832533</td>
<td>Keyboard-Printer</td>
<td>48'</td>
<td>1</td>
</tr>
<tr>
<td>3792</td>
<td>1832533</td>
<td>Keyboard-Printer</td>
<td>48'</td>
<td>1</td>
</tr>
<tr>
<td>3791</td>
<td>2577672</td>
<td>Aux. Control Unit</td>
<td>2,000'</td>
<td>3</td>
</tr>
<tr>
<td>3791</td>
<td>2577672</td>
<td>3760 mfd 1 and 3</td>
<td>2,000'</td>
<td>3</td>
</tr>
<tr>
<td>3791</td>
<td>2577672</td>
<td>3762 (indoor)</td>
<td>2,000'</td>
<td>3</td>
</tr>
<tr>
<td>3791</td>
<td>2577672</td>
<td>3732, 3736 (indoor)</td>
<td>2,000'</td>
<td>3</td>
</tr>
<tr>
<td>3791</td>
<td>1833108</td>
<td>3732, 3736 (outdoor)</td>
<td>2,000'</td>
<td>3</td>
</tr>
</tbody>
</table>

**Notes:**
1. Communications cable consisting of bulk cable #1544167 and connector group #1836445.
2. Indoor cable for both ends of communications cables.
3. Indoor cable for coax wire and connector kits refer to 3270 Cable Accessory section for prices and part numbers.

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LOCKS AND KEYS

1062: The 1062 is equipped with three locks (Teller A, Teller B, and Auditor) and a complement of keys ... two Teller A, two Teller B, one Master Teller, or Auditor) and one Auditor (normally fits all Auditor locks in the installation). Additional or replacement keys may be purchased. Locks may be changed in the field. Note: Removed locks should be destroyed locally.

1062 Key, each
Specify: For each set of keys — Machine Serial Number ... Key
(Teller A or B, Master Teller, or Auditor) ... Key Identification Number (stamped on key).

1062 Lock, field installation
For rental customer, each
1062 Lock, field installation
For purchase customer, Price based on return of old lock to IBM, ea
Specify: For field replacement of lock — Machine Serial Number and Lock (Teller A or B, Auditor) ... indicate any compatibility requirements (such as master teller key interchangeability) with locks on other units in the system. Each replacement lock includes two keys.

3275, 3276, 3277, 3278, 3732: The 3275, 3276, 3277, 3278 or 3732 with the Security Keylock (#6340) special feature is shipped with two keys. Additional keys may be purchased only from IBM. (Vendor will supply additional keys only to original purchaser.)

3275/3276/3277/3278/3732 Key (#2577741), each
Indicate serial number of lock.

3601: The 3601 is shipped with two keys. Additional keys may be purchased from IBM.

3601 Key, each
Indicate serial number of lock.

3610, 3612: The 3610 mdl 2 and 3612 mdl 2 with the Journal Takeup with Locked Cover (#4561) special feature are shipped with two keys. Additional keys may be purchased from IBM.

3610 mdl 2/3612 mdl 2 Key, each
Indicate serial number of lock.

3610 mdl 4: The 3610 mdl 4 is shipped with two keys. Additional keys may be purchased from IBM.

3610 mdl 4 Key, each
Indicate serial number of lock.

3631: The 3631 is shipped with two keys. Additional keys may be purchased from IBM.

3631 Key, each
Indicate serial number of lock.

3653: The 3653 is equipped with a cash drawer lock and can be equipped with an optional journal lock (#9322). The terminal is shipped with two cash drawer keys. The cash drawer lock will be randomly selected unless specified otherwise from the M 3653 pages. If the customer wishes to add or replace keys or locks with a specific identification number (stamped on lock and key) he should state the 3653's machine serial number and the Key Identification Number. Note: Without a Key Identification Number, the order should state Machine Serial Number and the words "NEW LOCK REQUIRED." If the optional journal lock is specified, the terminal will be shipped with two journal keys also. Additional or replacement keys may be purchased from IBM or a local locksmith. Locks may be changed in the field.

3653 Cash Drawer Lock including two keys, Part No. 1851086, each
3653 Cash Drawer Lock Key, ea (order by machine type & lock serial no)
3653 Journal Lock, Part No. 5995329, each
3653 Journal Lock Key, Part No. 5182285, ea (order by machine type and Part No.)

3663: 3663 Supermarket Terminal stations are equipped with three locks and a complement of keys. Locks and keys are as follows:
Cash drawer lock — randomly selected lock, number unless specified otherwise from the M 3663 page (2 keys shipped as standard).
Till Lock — standard key fits all tills (1 key shipped as standard per till).
Summary Journal Lock (optional feature #4660) — standard key fits all summary journals (1 key shipped as standard per journal).

Additional or replacement keys may be purchased from IBM or a local locksmith. Locks may be changed in the field.
If the customer wishes to add or replace keys or locks with a specific identification number (stamped on lock and key) he should state the 3663's Machine Serial Number and the Key Identification Number. If the customer does not specify key number, a new lock with keys will be randomly selected. Note: Without a Key Identification Number, the order should state Machine Serial Number and the words "NEW LOCK REQUIRED."

3663 Cash Drawer Key, ea (specify Machine Serial No. and Key Identification Number)
3663 Till Key, each
3663 Summary Journal Key, each
3663 Cash Drawer Keylock with 2 keys. (Specify Machine Serial No. and the Key Identification Number being replaced)
LOCKS AND KEYS (cont'd)

3683, 3684: The 3683 and 3684 are equipped with a cash drawer lock and can be equipped with an optional Journal Lock (#4690), optional Manager Keylock (#4905), and (3684 only) optional Diskette Cover Lock (#3310). The cash drawer lock and all other locks ordered will be shipped with two keys. The cash drawer lock, journal lock, manager lock, and diskette cover lock will be randomly selected unless specified otherwise from the M 3683 and M 3684 pages. If the customer wishes to replace a unique lock the order should state the 3683 or 3684 machine serial number, lock name and the lock Identification number (stamped on lock). (Note: Without an Identification number, the order should state machine serial number, lock name and the words "NEW LOCK REQUIRED.") Additional or replacement keys may be purchased from a local locksmith. Locks may be purchased from IBM and may be changed in the field.

The following randomly selected locks may be ordered by part number.

3683/3684 Cash Drawer Lock including 2 keys, Part NO. 8543281, each ** NC NC
3683/3684 Journal Lock, Part No. 8543620, each ** NC NC
3683/3684 Manager Lock, Part No. 8547992, each ** NC NC
3684 Diskette Cover Lock, Part No. 8543620, each ** NC NC

3735: The 3735 with Keylock (#4695) special feature is shipped with two keys. Additional or replacement keys may be purchased only from IBM. A new Keylock (#4695) special feature must be ordered if the Key Identification Number cannot be supplied.

3735 Key, each 2.50 NC NC
3747 Key, each 2.50 NC NC
3747 Lock, field installation ... for rental customer, each 11.00 UC NC NC
3747 Lock, field installation ... for purchase customer (price based on return of old lock to IBM), each 11.00 NC NC

3767: The 3767 with Security Keylock (#6660) feature is shipped with two keys. Additional or replacement keys may be purchased only from IBM. A new Security Keylock (#6660) special feature must be ordered if the Key Identification Number cannot be supplied.

3767 Key, each 2.50 NC NC

3289-3, 3771, 3773, 3774, 3775, 3776, 3777: The 3289-3, 3771, 3773, 3774, 3775, 3776 or 3777 with Keylock (#4650) special feature is shipped with two keys. Additional or replacement keys may be purchased only from IBM. A customer authorization letter with Key Identification Number stamped on key and lock barrel) must accompany each order.

3289-3, 3771, 3773, 3774, 3775, 3776, 3777 Key, each 2.50 NC NC

3780: The 3780 with Keylock (#4650) is shipped with two keys. Additional or replacement keys may be purchased only from IBM. Key Identification Number (stamped on key) must be specified on each order. Without Key Identification Number, a new Keylock (#4650) must be ordered.

3780 Key, each 2.50 NC NC

3760, 3762, 3791, 3792: The 3760, 3762, 3791 or 3792 with Security Keylock (#6350) is shipped with two keys. Additional keys may be purchased only from IBM. Indicate serial number of lock on the order.

3760, 3762, 3791 or 3792 Key, each 2.50 NC NC

3793: The 3793 Powerline Keylock (#5560) is shipped with two keys. Additional or replacement keys may be purchased from IBM. Key Identification Number (stamped on key) must be specified on order. Without Key Identification Number, a new feature (#5560) must be ordered.

3793 Key, each 2.50 NC NC

8130, 8140, 8101: The 8130, 8140 or 8101 with Keylock (#4655) is shipped with two keys. Additional keys may be purchased only from IBM. Indicate serial number of lock on the order.

8130, 8140, 8101 Key, each 2.50 NC NC

6775: The 6775 with the Security Keylock (#6340) feature is shipped with two keys. Additional keys may be purchased only from IBM. (Vendor will supply additional keys only to original purchaser.)

6775 Security Key, each (to be announced) NC NC

6775: The 6775 with the Set Up Keylock (#1009) feature is shipped with two keys. Additional keys may be purchased only from IBM. (Vendor will supply additional keys only to original purchaser.)

6775 Set Up Key, each (to be announced) NC NC

** Purchase Price to be announced.
ACCESSORIES

MOTOR GENERATOR AND STARTER
(S/370 – 3032, 3033, 3165, 3168)

These units are not manufactured by IBM and are available on a purchase only basis. Units must be ordered one year in advance of installation. Manufacturer’s warranty will be extended to the purchaser. Installation, checkout and maintenance will not be provided by IBM and any expenses involved must be borne by the customer.

see S/360 Installation Planning Manual GC22-6820, for installation requirements.

For S/370 mdl 165, 166, 3032 or 3033 Processor: If a motor generator set is chosen as the power source, then one Motor Generator Set (with internally mounted starter) is required for each S/370 mdl 165 and 166, 3062 Attached Processing Unit and 3032 or 3033 Processor. Two are required for a 168 MP system; one for each MP CPU. Specify: Feature # for Motor Generator Set on 3032, 3033, 3062, 3165 or 3168 machine order

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>208/230 VAC, 3-phase, 60 Hz - Motor Generator Set</td>
<td>$20,400</td>
</tr>
<tr>
<td>440 VAC, 3-phase, 60 Hz - Motor Generator Set</td>
<td>$20,400</td>
</tr>
</tbody>
</table>

Note: If more than one MG set is desired on initial order, specify quantity at the indicated prices.

If additional MG set is to be ordered for delivery after system order, as follows:

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor Generator Set ... 208/230 VAC</td>
<td>$20,400</td>
</tr>
<tr>
<td>Motor Generator Set ... 440 VAC</td>
<td>$20,400</td>
</tr>
</tbody>
</table>

† FOB shipping point with freight prepaid designation within the 48 contiguous states. For domestic accounts outside the 48 contiguous U.S., transportation costs are prepaid to port of embarkation in the U.S.

PIN FEED PLATENS
(1033, 1447, 2213
mdl 1, 2740, 2741,
3743, 3735, 3793)

For feeding of continuous forms that have pre-punched feed holes. On any one machine, one pin feed platen may be ordered for shipment with the machine in lieu of the standard solid platen. The platen becomes the property of the customer and cannot be returned for credit. order the applicable Feature # indicated below.

Regular Pin Feed Platen – available for 1033, 1447, 2213 mdl 1, 2740, 2741, 3674, 3735, 3793.

3713 – a pin feed platen with 6 lines/inch spacing is standard on the 3713. On initial machine order, any one of three hole-to-hole forms widths may be specified ... see 3713 "Machines" page. If Adjustable Margin Feature (#1115) is ordered, any one hole-to-hole forms width from 5-1/4" to 13-7/8" (#9151 thru #9168 ... see below) may be ordered in lieu of the choice listed under "Specify" on the 3713 "Machines" page.

For 1033, 1447, 2213 mdl 1, 2740, 2741, 3735, 3793. In lieu of standard friction feed platen (max., one per machine) ... on 3735 or 3793, only 6 lines/inch is available.

Pin Feed Platen (regular) $9509 $ 61.75 NC PO**

Specifying: #9509 at price indicated ... [2] Line Spacing and Hole-to-hole width: One feature #, depending upon forms width and line spacing, from "Line Spacing" below Prerequisite: On 1447, 2213 mdl 1, 2740 and 2741, the appropriate Feature # for line spacing on the basic machine (#9435 for 6 lines/inch, or #9436 for 8 lines/inch) is required ... see "Specify" under each unit in "Machines."

Line Spacing — with either #9509 or #9510, one of the following Feature #s must be specified in accordance with line spacing and hole-to-hole width of the forms which will be used.

<table>
<thead>
<tr>
<th>Over-all Forms</th>
<th>Width</th>
<th>Hole-to-hole</th>
<th>Writing</th>
<th>6 Lines/Inch</th>
<th>8 Lines/Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>5-3/4&quot;</td>
<td>5-1/4&quot;</td>
<td>4-5/8&quot;</td>
<td>9151</td>
<td>#9272</td>
</tr>
<tr>
<td>6-1/2&quot;</td>
<td>6&quot;</td>
<td>5-3/8&quot;</td>
<td>9152</td>
<td>#9272</td>
<td></td>
</tr>
<tr>
<td>8&quot;</td>
<td>7-1/2&quot;</td>
<td>6-7/8&quot;</td>
<td>9153</td>
<td>#9273</td>
<td></td>
</tr>
<tr>
<td>9-1/2&quot;</td>
<td>8&quot;</td>
<td>7-3/8&quot;</td>
<td>9154</td>
<td>#9274</td>
<td></td>
</tr>
<tr>
<td>9-7/8&quot;</td>
<td>9&quot;</td>
<td>6-3/8&quot;</td>
<td>9155</td>
<td>#9275</td>
<td></td>
</tr>
<tr>
<td>10-3/8&quot;</td>
<td>9-7/8&quot;</td>
<td>9-1/4&quot;</td>
<td>9156</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>10-1/2&quot;</td>
<td>10&quot;</td>
<td>9-3/8&quot;</td>
<td>9157</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>10-5/8&quot;</td>
<td>10-1/8&quot;</td>
<td>9-1/2&quot;</td>
<td>9158</td>
<td>#9278</td>
<td></td>
</tr>
<tr>
<td>11-3/4&quot;</td>
<td>11-1/4&quot;</td>
<td>10-5/8&quot;</td>
<td>9160</td>
<td>#9280</td>
<td></td>
</tr>
<tr>
<td>12&quot;</td>
<td>11-1/2&quot;</td>
<td>10-7/8&quot;</td>
<td>9161</td>
<td>#9281</td>
<td></td>
</tr>
<tr>
<td>13&quot;</td>
<td>12-1/2&quot;</td>
<td>11-7/8&quot;</td>
<td>9167</td>
<td>#9287</td>
<td></td>
</tr>
<tr>
<td>13-5/8&quot;</td>
<td>13-1/8&quot;</td>
<td>12-1/2&quot;</td>
<td>9162</td>
<td>#9282</td>
<td></td>
</tr>
<tr>
<td>14-3/8&quot;</td>
<td>13-7/8&quot;</td>
<td>13-1/4&quot;</td>
<td>9168*</td>
<td>#9288*</td>
<td></td>
</tr>
</tbody>
</table>

SPLIT FRICTION FEED PLATEN
(for 2740 mdl 2)

[Plant installation only] A two section platen with the split located to provide a 5-1/2" printing line on the left and 7-1/2" printing line on the right. Prerequisite: Document Insertion (#3401 or #3402) and Line Feeding, 6 lines/inch (#9435) on the 2740 mdl 2. Note: On any one machine, only one split friction feed platen may be ordered for plant installation in lieu of the standard friction feed platen. For additional friction feed platens, split friction feed platens,

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Split Friction Feed Platen, in lieu of friction feed Platen ... maximum, one per machine.</td>
<td>#9600 $ 76 NC PO</td>
</tr>
</tbody>
</table>

* Available only for 2213 mdl 1, 2740, 2741 or 3713. Use of this platen on the 2740/2741 does not extend the writing line beyond 13".

** #9509 at the prices indicated are to be used only for ordering the plant installation of a pin feed platen in lieu of the standard friction feed platen on original orders for these machines.

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ACCESSORIES

PRINT BELT, ADDITIONAL [3288, 3289, 3775, 3776, 3784, 3791, 3792]
Permits customer to obtain more than one character set print belt for various applications.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
<th>MMC</th>
<th>PIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>For 3288: 64-character EBCDIC</td>
<td>5920</td>
<td>160</td>
<td>—</td>
</tr>
<tr>
<td>120-character TN/TTI EBCDIC, Sans Serif font</td>
<td>5921</td>
<td>160</td>
<td>—</td>
</tr>
</tbody>
</table>

A metal belt with engraved font. See appropriate “Machines” page for restrictions and limitations. The belt can be used interchangeably with the one provided on the machine.

120 LPM Max — 3775
155 LPM Max — 3289-1, 3784, 3791, 3792
300 LPM Max — 3776-1
400 LPM Max — 3289-2, 3, 4, 3776-2

Available in EBCDIC and ASCII character arrangements.

For 3289*, 3776, 3784, 3791, 3792 48-character ASCII 5811** 180 — —
For 3289*, 3775, 3776, 3784, 3791, 3792 64-character ASCII 5812** 180 — —
For 3289*, 3775, 3776, 3784, 3791, 3792 94-character ASCII 5813** 180 — —
For 3776 48-character EBCDIC (HN Character Set) 5820 180 — —
For 3289, 3776, 3784, 3791, 3792 48-character EBCDIC 5821 180 — —
For 3289, 3776, 3784, 3791, 3792 64-character EBCDIC 5822 180 — —
For 3289, 3776, 3784, 3791, 3792 94-character EBCDIC 5823 180 — —
For 3289 125-char Text Print EBCDIC 5824 180 — —
For 3791, 96-char EBCDIC (word processing) Courier Typestyle 5831 170 — —
For 3791, 96-char EBCDIC (word processing) Artisan Typestyle 5832 170 — —
For 3791, 128-char EBCDIC (data & word processing) & ASCII 5833 170 — —

410 LPM Max — available in EBCDIC and ASCII character arrangements.

For 3791 48-character EBCDIC/ASCII 5825 160 — —
For 3791 64-character EBCDIC 5826 160 — —
For 3791 94-character EBCDIC 5827 160 — —
For 3791, 128-character EBCDIC (data & word processing) & ASCII 5834 170 — —

* 3289 mdl 1 and 2 only.
** ASCII Feature (#1201) is prerequisite on 3775 or 3776. For 3784, ASCII Feature (#1201) is prerequisite on 3774. ASCII Feature (#9022) required on 3791. For 3289, SCS Operation is not available with ASCII.

PRINT BELT, ADDITIONAL [3282]
Permits the customer to obtain more than one character set print belt for various applications. When ordering, use one feature # for character set size and one feature # for character height. Installation and replacement of these belts are the customer’s responsibility.

If customer desires to have IBM Field Engineering replace or install the print belt, the CE time will be billed to the customer.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
<th>MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>48-character EBCDIC</td>
<td>5940</td>
<td>170</td>
</tr>
<tr>
<td>64-character EBCDIC (optimized)</td>
<td>5943</td>
<td>170</td>
</tr>
<tr>
<td>64-character EBCDIC</td>
<td>5944</td>
<td>170</td>
</tr>
<tr>
<td>Character Set Height</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>2.0mm (.079&quot;)</td>
<td>5951</td>
<td></td>
</tr>
<tr>
<td>2.4mm (.095&quot;)</td>
<td>5950</td>
<td></td>
</tr>
</tbody>
</table>

Mercury Battery, IBM Part No. 1743456
Discharged batteries should be returned to IBM for disposal. Return information is printed on the label of the battery.

<table>
<thead>
<tr>
<th>Purchase</th>
<th>MMC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury Battery, IBM Part No. 1743456</td>
<td>17</td>
</tr>
</tbody>
</table>

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ACCESSORIES

3883/3884 TOTALS RETENTION BATTERY

To provide power for 240 bytes of storage to secure totals, transaction sequence number, terminal address, and other user-defined data against power off or power interruptions. Power source (Eveready #E134, Mailory TR134R or equivalent) is customer replaceable. The capacity rating of these type batteries when new is approximately 1000 milliamp hours. The life of the battery is determined by the shelf life which is approximately 5000 hours. This means that if a battery is installed in a 3883 or 3884 six months after manufacture, its useful machine life will be 6 months on the average.

It is recommended that the users' program test the battery state at least once per day. When the battery condition reaches the low threshold state, there is approximately 72 hours of battery life left. Procurement and replacement of the battery is the customer's responsibility. Customer must ensure that the power is "ON" the terminal when the battery is replaced or all information will be lost.

3883/3884 STORAGE RETENTION BATTERY

To provide power to retain data and programs in main storage and registers during primary power interruption. A 12.5 volt battery is shipped with the initial order for this feature (Storage Retention #7785). For replacement batteries order IBM Part Number 8543656 (or equivalent).

Purchase

Nickel Cadmium Battery, IBM Part No. 8543856

**

** To be announced.

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ACCESSORIES

3600 ACCESSORIES

Accessories for 3600 System equipment may be purchased from IBM or a customer selected source.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3601 md1 1</td>
<td>78999 Fuse (.5 Slow Blow)</td>
<td>$0.55</td>
</tr>
<tr>
<td>3603</td>
<td>111262 Fuse (.4 Slow Blow)</td>
<td>$0.45</td>
</tr>
<tr>
<td></td>
<td>1176668 Fuse (1.5A Slow Blow)</td>
<td>$0.80</td>
</tr>
<tr>
<td>3604 Keytop Labels Mds 1, 2, 3, 4</td>
<td>1561332 Blank Base for Customization</td>
<td>$0.90</td>
</tr>
<tr>
<td></td>
<td>1562333 Clear Protective Overlay</td>
<td>$1.10</td>
</tr>
<tr>
<td></td>
<td>1561341 Preprinted (Group 1)</td>
<td>$2.40</td>
</tr>
<tr>
<td></td>
<td>1561342 Preprinted (Group 2)</td>
<td>$2.45</td>
</tr>
<tr>
<td>3604 Overlays Models 5, 6</td>
<td>4942506 White Background 45 Key</td>
<td>$2.30</td>
</tr>
<tr>
<td></td>
<td>4942515 Blue Insert 15 Key</td>
<td>$1.65</td>
</tr>
<tr>
<td></td>
<td>4943749 Clear Protective Cover 45 Key</td>
<td>$1.40</td>
</tr>
<tr>
<td>3606/3608</td>
<td>1652103 Fuse Holder Assembly</td>
<td>$1.50</td>
</tr>
<tr>
<td></td>
<td>1702817 Display Filter - Standard</td>
<td>$3.45</td>
</tr>
<tr>
<td></td>
<td>1702847 Keyboard Overlay - Standard</td>
<td>$1.65</td>
</tr>
<tr>
<td></td>
<td>1702848 Keyboard Overlay - Blank except for Numerics</td>
<td>$1.65</td>
</tr>
<tr>
<td></td>
<td>1702849 Keyboard Overlay - Protective Cover</td>
<td>$0.50</td>
</tr>
<tr>
<td></td>
<td>1702867 Keyboard Overlay - Std Fctn Key Nomenclature</td>
<td>$1.65</td>
</tr>
<tr>
<td></td>
<td>1702904 Display Filter -Blank Red</td>
<td>$2.05</td>
</tr>
<tr>
<td></td>
<td>1702934 Keyboard Overlay - Blank Fctn Key Nomenclature</td>
<td>$1.65</td>
</tr>
<tr>
<td></td>
<td>1745353 Jumper Assembly (Signal Attenuation)</td>
<td>$1.05</td>
</tr>
<tr>
<td></td>
<td>5929886 Wall Plate Assembly</td>
<td>$13.50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The following accessories may be obtained</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diskettes ... Magnetic Passbook Labels ... Ink Rolls ... 3618 Printer Ribbon</td>
<td></td>
</tr>
</tbody>
</table>

3600 System LOOP REPEATER

(P/N 4400002) Plugs into the Loop cable and redrives all signals being transmitted in a 3600 Finance Communication System. Each Loop Repeater contains Loop redriving capabilities which allow for the extension of the Loop cable length by 2000 feet. Loop Repeaters may be employed on a Loop to extend its overall length to a maximum of 20,000 cable-feet. The unit can be physically mounted on a wall in an out-of-the-way location.

Prerequisite: An operating 3600 System Local Loop or Remote Subloop.

Bibliography: GC22-0005

Customer Responsibilities: The customer must be advised that: [1] The customer is responsible for making certain that the use of the equipment complies with all Federal, State, and Local Laws, Regulations, and Ordinances ... [2] The customer is responsible for price quotations, installation and cost (initial and recurring) of common carrier equipment and service ... [3] The customer is responsible for the set-up of the unit ... [4] The customer will determine the failing unit (see 'Maintenance' below) ... [5] The customer is responsible for determining the required number of spares.

Physical Planning and Set-up: Physical planning and set-up is the responsibility of the customer. Attachment to the Loop cable is provided by ordering External Signal Cable Assembly (IBM P/N 1745372) or equivalent ... see IBM 3600 Finance Communication System Installation Manual - Physical Planning, GA27-2766.

Spares: The customer may wish to replace a failing unit with a spare and must be advised to purchase sufficient spare units for such use. The number of spare units recommended is dependent upon the number of units the customer has installed, application requirements, physical locations and layouts. However, the minimum number of spare units recommended is shown in the following table:

<table>
<thead>
<tr>
<th>Number of Loop Repeaters Installed</th>
<th>Minimum Number of Spares Recommended</th>
<th>Number of Loop Repeaters Installed</th>
<th>Minimum Number of Spares Recommended</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>2</td>
<td>2500</td>
<td>12</td>
</tr>
<tr>
<td>200</td>
<td>2</td>
<td>3000</td>
<td>14</td>
</tr>
<tr>
<td>300</td>
<td>3</td>
<td>3500</td>
<td>16</td>
</tr>
<tr>
<td>500</td>
<td>4</td>
<td>4000</td>
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<td>1000</td>
<td>6</td>
<td>4500</td>
<td>19</td>
</tr>
<tr>
<td>1500</td>
<td>9</td>
<td>5000</td>
<td>21</td>
</tr>
<tr>
<td>2000</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Warranty: Service is available at the designated IBM Repair Center during the 90 day warranty period, which commences 30 days following date of shipment from the plant of manufacture (Raleigh). It shall be the customer’s responsibility to set up the equipment. It shall be the customer’s responsibility to determine the failing unit and remove it from the Loop, and if the unit is still under warranty, to pack it in the designated shipping container and ship it prepaid to the designated IBM Repair Center. IBM will return the serviced unit, shipping charges prepaid. There is no regularly scheduled preventative maintenance recommended by IBM on these units.

Maintenance agreements are not available. FE on-site service will not be provided.

Ordering: Order Part No. 4400002

<table>
<thead>
<tr>
<th>Machine</th>
<th>Part No.</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loop Repeater, each</td>
<td>3601 44000002</td>
<td>$350</td>
</tr>
<tr>
<td>Loop Repeater, each</td>
<td>3602 4400002</td>
<td>$350</td>
</tr>
</tbody>
</table>

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ACCESSORIES

3614 LOGO PANEL

#9401 or #9402

A purchase only accessory for either a 3614 mdl 1, 2, 11 or 12. The personalization panel provides an area on the top half of the front of the 3614 that can be personalized by the customer (silk-screened, painted, etc.). The area is provided for customer name and/or advertising purposes.

Logo Panel

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>#9401</td>
<td>$ 84.75</td>
</tr>
<tr>
<td>Part No.</td>
<td>Purchase Price</td>
</tr>
<tr>
<td>2750814</td>
<td>$ 84.75</td>
</tr>
</tbody>
</table>

Note: Additional logo panels, Part No. 2750814, may be ordered at the price indicated above.

3614 MODEL 2/12

ACCESSORY GROUP

[Purchase Only] The 3614 Model 2/12 Accessory Group consists of a heavy duty enclosure, a through-the-wall bezel and a mounting stand.

Heavy Duty Enclosure: Provides a strong steel enclosure for the through-the-wall configuration. This enclosure has a rear access door with a resettable combination lock and a provision for a keylock. The combination for the combination lock is set by the customer. The customer must provide the actual keylock and the key. Limitation: For 3614 mdl 2 or 12 only.

Through-the-Wall Bezels: Provides a frame around the through-the-wall portion of the 3614 mdl 2 or 12 and provides a casement for the hole in the wall.

Mounting Stand: Provides a support stand for the 3614 mdl 2 or 12 that comes in three different heights. Specify: Height — #9572 for 4", #9573 for 7", or #9574 for 10".

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>#9571</td>
<td>$ 4,500</td>
</tr>
</tbody>
</table>

Note: These items are provided as accessories to the 3614 mdl 2 or 12 to facilitate installation of the 3614 mdl 2 or 12 through-the-wall. Installation, checkout, and maintenance of these items will not be provided by IBM. All responsibility and expenses involved must be borne by the customer.

Warranty for 3614 Model 2/12 Accessory Group: For 90 days commencing on the date of installation or 30 days after shipment, whichever comes first, these accessories are warranted free from defects in materials and workmanship. IBM’s obligation is limited to providing replacement parts on an exchange basis.

Delivery Instructions:

Due to installation requirements, the Accessory Group will generally be shipped three weeks prior to the 3614.

The "Heavy Duty Enclosure" included in this Accessory Group is, in effect, a steel safe with dimensions of approximately 43" x 28" x 63" and weighing approximately 2800 pounds. It does not have casters and will be transported on a skid. The item will be shipped via common carrier to the delivery point designated by the customer and will probably require special handling or rigging at destination. The customer should be advised that it is suggested this item be delivered directly to a local drayman that has the facilities to move an item of these dimensions and weight. The customer should then make local provisions to have the Accessory Group delivered for physical installation at the selected site.

Close coordination should be maintained with the customer, Customer installation responsibilities should be noted as described in the 3614 "Machines" pages and in this section.

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3624 MODELS 2 and 12 ... INSTALLATION ACCESSORIES

Accessories

[Purchase only] Provide heavy-duty steel enclosure, through-the-wall bezel, front trim border, front dress panel, and pedestal base for installation of mdls 2 and 12 in configurations suitable for walk-up or drive-up use.

A heavy-duty enclosure is required. Two heavy-duty enclosures are available. A single function enclosure houses the currency dispensing mechanism on mdls 2 and 12 that do not have a depository. A dual function enclosure houses both the currency dispensing and the depository mechanisms on mdls 2 and 12 that have a depository. The dual function enclosure can also be used to house the currency dispensing mechanism only, on mdls 2 and 12 that do not have a depository. Both enclosures have a single rear access door that includes a combination lock. The combination of the combination lock is set by the customer. A second combination lock is available as an optional feature. A dial keylock is available. Both enclosures have a penetration-detection alarm grid across the inside of the front face. Construction of the heavy-duty enclosures meets requirements of UL291 and complies with the intent of U. S. Federal Regulation P for unattended paying and receiving machines.

Pedestal bases are available in a number of sizes to mount the enclosure at a height most suitable for walk-up or drive-up use. The recommended nominal mounting heights are 1321 mm (52 inches) from keyboard centerline to the intent of U.

Storage cabinet with standard key is included in the pedestal base. A lockable storage cabinet only is also available that can be used with the dual function heavy-duty enclosure to mount the enclosure directly to a floor surface where a pedestal is not required.

A through-the-wall bezel, front trim border that fits around the bezel, and front dress panel that fits within the bezel are required. Two through-the-wall bezels are available - one with a recessed bezel providing a convenient shelf surface for user and recommended for a walk-up installation, and another with a non-recessed bezel positioning the user guidance area nearer the outside wall surface for more convenient use by a vehicle occupant and recommended for a drive-up installation. Two front trim borders are available - one with an envelope holder for depository transactions, and another without an envelope holder.

Warranty: These accessories are warranted free from defects in materials and workmanship for 90 days, commencing either on the date of installation or 30 days after shipment, whichever occurs first. IBM's obligation is limited to providing replacement parts on an exchange basis during the warranty period.

Delivery Instructions:

The "Heavy-Duty Enclosure" included in this group of accessories is a steel enclosure with dimensions of approximately 432 mm x 914 mm x 1575 mm (17" x 36" x 62") and weight of approximately 950 kg (2100 pounds) for the dual function unit, and dimensions of approximately 432 mm x 914 mm x 991 mm (17" x 36" x 39") and weight of approximately 880 kg (1950 pounds) for the single function unit. The enclosure does not have casters and will be transported on a skid.

The item will be shipped via common carrier to the delivery point designated by the customer and may require special handling or rigging at destination. The customer should be advised that it is suggested this item be delivered directly to a local drayman that has facilities to move an item of these dimensions and weight. The customer then should make local provisions to have the enclosure delivered for physical installation at the selected site.

Heavy-Duty Enclosure, Single Function (#3901): Used to enclose currency dispensing mechanism on 3624 mdls 2 or 12 that do not have a depository. Prerequisites: Bezel, Through-the-Wall (#1490 or 1491), Front Dress Panel (#3951), and Front Trim Border Without Envelope Holder (#3962). Note: Pedestal (#4901), that includes a lockable storage cabinet, is available in several heights to mount the single function enclosure. Limitation: Cannot be installed with Depository, Through-the-Wall (#3243), Pedestal for Dual Function Heavy-Duty Enclosure (#4902), Storage Cabinet for Dual-Function Heavy-Duty Enclosure (#4903), or Front Trim Border with Envelope Holder (#3961). Single Function Heavy-Duty Enclosure (#3901) cannot be field upgraded to a Dual Function Heavy-Duty Enclosure (#3902).

Heavy-Duty Enclosure, Dual Function (#3902): Used to enclose the currency dispensing and the depository mechanism on 3624 mdls 2 or 12 that have a depository. May also be used to enclose the currency dispensing mechanism only and provide spare lockable storage space on 3624 mdls 2 or 12 that do not have a depository. Prerequisites: Bezel, Through-the-Wall (#1490 or 1491), Front Dress Panel (#3951), and Front Trim Border, With or Without Envelope Holder (#3961 or 3962). Note: Pedestal (#4902), that includes a lockable storage cabinet, is available in several heights to mount the dual function enclosure ... a lockable storage cabinet only (#4903) is also available to mount dual function enclosure directly to a floor surface where a pedestal is not required. Limitation: Cannot be installed with Pedestal for Single Function Heavy-Duty Enclosure (#4901). Single Function Heavy-Duty Enclosure (#3901) cannot be field upgraded to a Dual Function Heavy-Duty Enclosure (#3902).

Dial Keylock (#3310): (Optional) Provides keylock for the combination dial on a heavy-duty enclosure. Can be used where dual control and/or bank examiner type lock is desired. When locked, the combination dial cannot be turned. Specify: #9251 for key removable when locked or unlocked, dial must be locked by key ... #9252 for key removable when locked or unlocked, indicator is pushed in to lock the dial automatically ... #9253 for key removable when locked only, dial must be locked by key. Maximum: One. Limitation: Installed on only one combination dial where Dial Lock (#3375) is also ordered. Field Installation: Available at time of manufacture only.

3624 Currency Area Lockoff (#3312). [Models 2 and 12 only] [Purchase Only] Provides a security panel to enclose the currency area. Enables the document feed mechanism to be locked in the machine. When used with the Depository Cardige Locking Feature (#3150), it restricts access to the currency area during normal operational servicing of the deposit and/ or other areas of the 3624. Includes keylock and standard key. Note: This accessory does not change the customer's responsibility to remove any currency in the 3624 when the unit has to be serviced by a CE. If customer desires to change lock and/or key provided, customer is responsible for their procurement and installation. Limitation: Cannot be installed with Heavy-Duty Enclosure, Single Function (#3901). Maximum: One.

Dual Lock (#3375): (Optional) Provides second combination-lock on rear access door. Field Installation: No.

Bezel, Through-the-Wall, Recessed (#9249), Non-Recessed (#1491): Bezel for through-the-wall installation of these dimensions and weight.
3624 MODELS 2 and 12 ... INSTALLATION ACCESSORIES (cont'd)

3624. #1490 is recessed, providing a shelf surface, and is recommended for walk-up installation. #1491 is non-recessed, placing the user guidance area nearer the outside wall surface for convenience of a vehicle occupant, and is recommended for drive-up installation. **Prerequisites:** Heavy-Duty Enclosure, Single or Dual Function (#3901 or 3902), Front Dress Panel (#3951), and Front Trim Border With or Without Envelope Holder (#3961 or 3962).

**Pedestal for Single Function Heavy-Duty Enclosure (#4901):** For mounting 3624 mdls 2 or 12 that use the single function enclosure. Consists of a base stand and a lockable storage cabinet. A standard key is provided. Available in heights to position the keyboard centerline 1067, 1194, or 1321 mm (42, 47, or 52 inches) from mounting surface. **Note:** If single function enclosure is installed without a pedestal, the keyboard centerline is 368 mm (14.5 inches) from mounting surface. **Prerequisite:** Heavy-Duty Enclosure, Single Function (#3901). **Limitation:** Cannot be installed with Heavy-Duty Enclosure, Dual Function (#3902). **Specify:** Height of keyboard centerline from mounting surface:

- #9701 1067 mm (42 inches)
- #9702 1194 mm (47 inches)
- #9703 1321 mm (52 inches)

**Pedestal for Dual Function Heavy-Duty Enclosure (#4902):** For mounting 3624 mdls 2 or 12 that use the dual function enclosure. Consists of base stand and a lockable cabinet. A standard key is provided. Available in sizes to position the keyboard centerline 1067, 1194, or 1321 mm (42, 47, or 52 inches) from mounting surface. **Note:** See Storage Cabinet for Dual Function Heavy-Duty Enclosure (#4903) for installing with keyboard centerline height lower than 1067 mm (42 inches) from mounting surface. **Prerequisite:** Heavy-Duty Enclosure, Dual Function (#3902). **Limitation:** Cannot be installed with Heavy-Duty Enclosure, Single Function (#3901). **Specify:** Height of keyboard centerline from mounting surface:

- #9701 1067 mm (42 inches)
- #9702 1194 mm (47 inches)
- #9703 1321 mm (52 inches)

**Storage Cabinet for Dual Function Heavy-Duty Enclosure (#4903):** Lockable storage cabinet only, for 3624 mdls 2 or 12 dual function enclosure mounted directly to floor surface without pedestal. The keyboard centerline height is 965 mm (38 inches) from mounting surface. A standard key is provided. **Prerequisite:** Heavy-Duty Enclosure, Dual Function (#3902). **Limitation:** Cannot be installed with Heavy-Duty Enclosure, Single Function (#3901). **Note:** Storage cabinet is included with the Pedestal for Dual Function Heavy-Duty Enclosure (#4902).

**Front Dress Panel (#3951):** Provides panel to cover face of heavy-duty enclosure and I/O module. **Prerequisites:** Bezel, Through-the-Wall, Recessed or Non-Recessed (#1490 or 1491), and Heavy-Duty Enclosure, Single or Dual Function (#3901 or 3902).

**Front Trim Border, With Envelope Holder (#3961), Without Envelope Holder (#3962):** Provides trim paneling around the bezel to seal through-the-wall installation. #3961 includes built-in depository envelope holder and is available only when the depository feature is installed. #3962 does not include a depository envelope holder. **Prerequisites:** (1) Bezel, Through-the-Wall, Recessed or Non-Recessed (#1490 or 1491) ... (2) Front Trim Border, With Envelope Holder (#3961) requires Depository, Through-the-Wall (#3243).

**ACCESSORY PRICES:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy-Duty Enclosure, Single Function [one req'd]</td>
<td>$1,860</td>
</tr>
<tr>
<td>Dial Function</td>
<td>2,290</td>
</tr>
<tr>
<td>Dial Keylock [optional]</td>
<td>65</td>
</tr>
<tr>
<td>3624 Currency Area Lockoff [&quot;Specify&quot; above for keying options]</td>
<td>120</td>
</tr>
<tr>
<td>Dual Lock [optional]</td>
<td>136</td>
</tr>
<tr>
<td>Bezel, Through-the-Wall [one req'd]</td>
<td>303</td>
</tr>
<tr>
<td>Recessed Non-Recessed (Drive-up use)</td>
<td>259</td>
</tr>
<tr>
<td>Pedestal, Includes Storage Cabinet [optional]</td>
<td>759</td>
</tr>
<tr>
<td>for Single Function Heavy-Duty Enclosure [&quot;Specify&quot; above for mounting height]</td>
<td>393</td>
</tr>
<tr>
<td>Storage Cabinet for Dual Function Heavy-Duty Enclosure [Optional]</td>
<td>182</td>
</tr>
<tr>
<td>[Keyboard height = 965 mm (38 inches)]</td>
<td></td>
</tr>
<tr>
<td>Front Dress Panel [one req'd]</td>
<td>215</td>
</tr>
<tr>
<td>Front Trim Border, Without Envelope Holder [one req'd]</td>
<td>237</td>
</tr>
<tr>
<td>With Envelope Holder</td>
<td>122</td>
</tr>
</tbody>
</table>

**3624 MODELS 1 and 12 ... PEDESTAL, LOBBY (#5510):**

[Purchase only] Provides optional mounting stand for 3624 mdls 1 or 11 that do not have depository feature. **Note:** A pedestal base with casters is included with the lobby model depository special feature. **Limitation:** #5510 cannot be installed with Depository, Lobby (#3233).

**ACCESSORY PRICES:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestal, Lobby</td>
<td>$467</td>
</tr>
</tbody>
</table>

**3624 LOGO PANEL (#9401, 9402 or 9403):**

[Purchase only] Backlighted Logo Panel, suitable for customization by silkscreening or other acceptable process.

**ACCESSORY PRICES:**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>If #9401 is specified, logo panel will be shipped with 3624</td>
<td>$48</td>
</tr>
</tbody>
</table>

If #9402 is specified, logo panel will be shipped approximately three weeks prior to 3624. **Note:** More than one panel may be ordered when #9402 is specified (e.g., customer may desire to order spares or to arrange to have several panels delivered for customization at one time). If one panel is ordered using #9402, then #9403 should be specified on the other 3624s to avoid duplicating orders for logo panels.

- 9402 48 N/A

If #9403 is specified, logo panel will not be ordered with 3624 and must have been ordered either separately by part number through MES or as #9402 on another 3624. To order by Part Number

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3624 CURRENCY CARTRIDGE:

(Purchase only) Portable currency container, interchangeable between 3624s. Cartridge case is made of a high-impact resistant, fire retardant material. Removable access cover and built-in carrying handle for ease of loading and transportation. Locking mechanism provides for customer installation of keylock and affixing security seals to help prevent unauthorized access to contents during storage or transport of the cartridge. The cartridge is connected to a cartridge drive station in the 3624 for power and communication of cash-low and cash-out currency levels. A keying system is provided so that a match between the cartridge and the cartridge drive station must be satisfied before the cartridge can be properly loaded in the drive station. The maximum new bill capacity is 2300 bills. The used bill capacity is approximately 1700.

Customer Responsibilities - 3624 Currency Cartridge: The customer must be advised that: (1) The customer is responsible for determining if the cartridge is the failing unit ... (2) The customer should schedule the frequency of cleaning and belt replacement procedure for optimum cartridge performance according to the usage, to maintain maximum machine availability ... (3) The customer may repair cartridge or send back to Repair Center (see "Maintenance" below) ... (4) The customer is responsible for determining required spares (see "Spare s" below) ... (5) The customer is responsible for providing cartridge for CE 6324 maintenance and testing; a minimum of one spare cartridge for mlds 1 and 2 and two spare cartridges for mlds 11 and 12 must be made available by customer to the CE for normal 3624 maintenance ... (6) The customer is responsible for setting the keying system on the cartridges and drive stations so that there is the desired match of currency denomination to drive station ... (7) Purchaser agrees that IBM is relieved of responsibility for all claims, including, but not limited to, loss of currency or documents contained in, dispensed by, or associated with the cartridge.

Spares: The customer may wish to replace (1) an empty or partially loaded cartridge with a fully loaded cartridge, (2) a failing cartridge with a spare for problem determination or while malfunctioning cartridge is being repaired, (3) a cartridge to enable the IBM CE to perform 3624 maintenance and testing. The customer should be advised to purchase sufficient cartridges to cover the above uses. The number of cartridges recommended is dependent upon the total number of cartridge drive stations the customer has installed, application requirements, physical location of 3624s, and location where cartridges are temporarily stored and loaded. The customer must be advised that it is recommended that spare cartridges should remain in use and not be stored for extended periods. A recommended quantity of spare cartridges and spare replacement belts per cartridge drive station is shown below. It assumes for every loaded cartridge installed in a cartridge drive station, another cartridge is available for currency replenishment. In addition, approximately one spare is available for every three cartridge drive stations. This should provide sufficient quantity of spares for customer and CE 3624 testing and for temporary replacement of cartridges in repair. The quantities should be adjusted to the customer's particular application requirements once the physical environment and usage affect on the cartridge and belt wear is understood. The customer can replace separator and restraint belts in conjunction with performing the recommended operator cleaning and belt replacement procedure. Belts can be ordered

<table>
<thead>
<tr>
<th>Cartridge Drive Stations (*)</th>
<th>Recommended Quantity of Cartridges (including spares)</th>
<th>Recommended Minimum Quantity Spare Replacement Belts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>Separator Belt P/N 945307 Restraint Belt P/N 945242</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>3</td>
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<tr>
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<td>3</td>
</tr>
</tbody>
</table>

* 24 mlds 1 and 2 have one cartridge drive station and mlds 11 and 12 have two cartridge drive stations.

Cartridges and belts required for more than ten drive stations can be extrapolated from the above table by taking a multiple of these numbers. Additional quantities over the recommended minimum quantity of spare replacement belts should be ordered as required, as part of the customer periodic belt inspection and replacement schedule for cartridges (in conjunction with IBM's general recommendation).

Maintenance: Cartridges are not maintained by IBM under the normal lease agreement or MMMC for purchased machine. A recommended operator cleaning and belt replacement procedure is provided in the IBM 3624 Cartridge Owner's Manual, GA66-0005; under adverse operator conditions, it is the customer's responsibility to modify the procedure to meet his own particular requirements. The customer can replace separator and restraint belts in conjunction with performing the recommended procedure. If the cartridge is in need of repair, he can send it to a designated IBM Repair Center. It is the customer's responsibility to package the unit in the designated shipping container and ship it prepaid to the designated IBM Repair Center.

IBM Repair Center Service: For cartridge repair, the customer will fill out an IBM Repair Authorization Form GX27-2981, pack it and the defective cartridge in the designated shipping container, and ship it prepaid to the designated IBM Repair Center, where repair will be made if the cartridge is repairable. The charge for the repair of the cartridge at IBM Repair Center will cover handling, inspection, cleaning, repair, adjustment, testing, and return shipping. Charges will be at IBM's applicable hourly rates. In addition, all parts needed will be billed at IBM's prevailing parts prices. Alternatively, upon request, the IBM Repair Center will provide, for a minimum charge, an estimate of repair charges.

If on the basis of an inspection, the repair center concludes that a cartridge is not repairable, no further work will be performed and the cartridge will be returned to the customer with a minimum charge to cover handling, inspection, testing, and return shipping charges.

Warranty: The cartridge is warranted to be free from defects in workmanship and material for a period of 90 days, commencing either on the date of installation or 30 days after shipment, whichever occurs first. Warranty service for the cartridge will be performed at the IBM Repair Center. If warranty service is performed at an IBM Repair
ACCESSORIES

3624 CURRENCY CARTRIDGE (cont'd)

Center, the customer will fill out an IBM Repair Authorization Form GX27-2981, pack it and the defective cartridge in the designated shipping container, and ship it prepaid to the designated IBM Repair Center.

Ordering: Order by feature number below and specify quantity.

ACCESSORY PRICES:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
<th>MMCN</th>
</tr>
</thead>
<tbody>
<tr>
<td>3624 Currency Cartridge</td>
<td>$335</td>
<td>TM**</td>
</tr>
</tbody>
</table>

** Time and Material at IBM Repair Center only.

Note: For cartridge parts, refer to the IBM 3624 Cartridge Owner’s Manual, GA66-0005.

3624 DEPOSITORY CARTRIDGE (3155):

[Purchase Only] Portable container for deposits. Required with Depository Cartridge Locking Feature (#3150). Capacity of approximately 300 deposited envelopes (certain conditions could cause capacity to vary). Cartridge case is made of a high-impact resistant, fire retardant material. Built-in carrying handle provides ease of loading and transportation. Locking mechanism provides for customer insertion of keylock. The cartridge is loaded into the 3624 depository in the closed and locked condition. During loading, the locking mechanism slides the cartridge door closed and locks it before the cartridge may be removed from the 3624. Cartridges can be opened only by a companion key corresponding to the key in the 3624.

There is also provision for affixing a seal to the locked cartridge. A mechanical counter, enclosed within the cartridge, is incremented each time the door is partially opened, providing an audit against unauthorized access.

Customer Responsibilities - 3624 Depository Cartridge: The customer must be advised that: (1) The customer is responsible for procurement and installation of cartridge lock and for installation of the companion cartridge lock key in the 3624 depository locking mechanism ... (2) The customer is responsible for determining required spare parts (see “Spares” below) ... (3) The customer is responsible for determining if the cartridge is the failing unit ... (4) The customer is responsible for providing cartridge when required for CE 3624 depository maintenance and testing ... (5) The customer is responsible for replacement, if required, of the cartridge audit counter ... (6) Purchaser agrees that IBM is relieved of responsibility for all claims, including, but not limited to, loss of currency or documents contained in or associated with the depository cartridge ... (7) The customer will be responsible for removing, controlling and reloading all money and deposits in the 3624 when the unit has to be serviced by a CE.

Maintenance: Cartridges are not maintained by IBM under the normal lease agreement or MMCN for purchased machines. Replacement, if required, of the security lock and the internal audit counter in the cartridge is the responsibility of the customer. IBM Maintenance Agreements are not available. Field engineering on-site service will not be provided. IBM Repair Center service is not available.

Spares: To maintain continual depository operations at the ATM, at least two cartridges are required. Additional spares may be required, depending upon deposit volume between scheduled unloadings such as over weekends, physical location of 3624s, where cartridge contents are removed, where temporarily stored, and the needs for problem determination in the event of depository malfunctioning. A recommended nominal quantity of cartridges per 3624, including spares, is shown below. It assumes for every depository cartridge loaded in a machine, another cartridge has been unloaded, emptied and made available. In addition, approximately one spare is available for every five 3624s. This should provide sufficient quantities of spares for customer and CE 3624 testing and for replacement of inoperative cartridges. These quantities should be adjusted to the customer's particular system requirements.

<table>
<thead>
<tr>
<th>3624s</th>
<th>Recommended Quantity of Cartridges (Including Spares)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
</tr>
<tr>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>9</td>
<td>20</td>
</tr>
<tr>
<td>10</td>
<td>22</td>
</tr>
</tbody>
</table>

Cartridges required for more than ten 3624s can be extrapolated from the above table by taking a multiple of these numbers.

Warranty: The cartridge is warranted free from defects in workmanship and material for a period of ninety (90) days, commencing either on the date of installation or 30 days after shipment, whichever occurs first. Defective cartridges will be replaced under the warranty provisions.

Ordering: Order by feature number below and specify quantity.

ACCESSORY PRICES:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
<th>MMCN</th>
</tr>
</thead>
<tbody>
<tr>
<td>3624 Depository Cartridge</td>
<td>$140</td>
<td>N/A</td>
</tr>
</tbody>
</table>

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ACCESSORIES

3630 SYSTEM and 8100 SYSTEM - Loop Cable

Loop Cable may be purchased from IBM or a customer selected source. See IBM 3630 Plant Communication System - Loop Installation Manual - Physical Planning, GA24-3676 or 8100 Information System Loop Installation Manual - Physical Planning, GA27-2878.

Bulk Loop Cable Description Part No. Purchase
#22 AWG Internal .64mm diameter 1657265
#22 AWG External Above Ground .64mm diameter 1657267
#22 AWG External Under Ground .64mm diameter 1657268

Ordering Instructions: Interior cable (P/N 1657265) should be ordered in 1000 feet (30,000 cm) rolls in one continuous length. Additional footage greater than a roll(s) length can be ordered by specifying the number of feet wanted (up to 999). A minimum order quantity is one roll (1000 feet).

Exterior cable (P/N 1657267 and 1657268) can be ordered by specifying the length up to a maximum of 3000 feet (90,000 cm) in one continuous length. Outdoor splices with aerial and burial cable should be avoided by ordering one continuous length.

Warranty: Loop Cable is warranted free from defects of workmanship and materials for 90 days.

Loop Accessories (3630, 8100)

A group of accessory products are offered to permit plant electricians or contract personnel to install the loops.

Loop Splice Plate (LSP) — The LSP splits together two segments of indoor cable or provides a connecting point for future expansion of the loop. The LSP consists of a single connector strip, to which the incoming loop cable and the outgoing loop cable can be attached; it is installed in a standard outlet box for business office environments, or weatherproof outlet box for industrial environments.

Loop Station Connector (LSC) — The LSC is available as two unique types: wrap and radial. The wrap LSC attaches an I/O unit or controller directly to the main loop cable; the radial LSC attaches an I/O unit only through an LWC to the loop. The wrap LSC attaches an incoming and outgoing loop cable; the radial LSC attaches at the end of one loop cable from the LWC. The wrap LSC also offers the isolation feature of wrapping which allows the customer to wrap the loop away from a loop wiring failure or to reconfigure the loop during alterations. Both wrap and radial LSCs contain bypass relays that bypass the I/O unit when the I/O unit is powered-off or disconnected. These accessories are installed in a standard or weatherproof outlet box.

Loop Wiring Concentrator (LWC) — The LWC provides the facility to attach a cluster of I/O units without a large number of drops on the loop cable. It attaches up to eight radial LSCs at the end of loop cables called radials. The point where a radial line terminates at the LWC is called an LWC Port. Not all ports have to be used; unused ports can be reserved for future expansion.

The LWC has the same wrapping capability as the wrap LSC. In addition, the LWC allows the customer to bypass one or more of the radials by setting a corresponding switch located inside the LWC.

The LWC has its own enclosure or can be mounted in a NEMA-4X electrical equipment cabinet, with minimum measurement of 36x30x15 cm (14x12x6 in.).

Loop Surge Suppressor (LSS) — The LSS allows the loop to run across an outdoor space to another building. It attaches two outdoor cables and two indoor cables, allowing the proper termination and grounding for each type of cable. In addition, the LSS contains four surge protectors, one for each twisted pair in the two outdoor cables, to protect from voltage surges caused by near strikes of lightning. There is no protection in the LSS from a direct lightning strike.

The LSS has its own enclosure or can be mounted in an electrical equipment cabinet, with minimum measurement of 36x30x15 cm (14x12x6 in.).

Continuity and Relay Tester — The Continuity and Relay Tester is used with a volt-ohm meter to verify the loop installation, including loop cabling and accessories, after completion. By plugging the tester into any loop station connector and connecting any volt-ohm meter rated at least 5000 ohms/volt to the tester, the condition of the wire segment being tested can be determined as to conductor and shield continuity (opens or shorts), wrap switch operation, and total lobe resistance. The loop station connector relays are also activated and their operation verified with this tester.

Loop Accessories Part No. Purchase
Loop Splice Plate (LSP) 1657300 $6.00
Loop Station Connector (Radial LSC) 1657310 40.00
Loop Station Connector (Wrap LSC) 1657320 70.00
Loop Wiring Concentrator (LWC) 1657330 160.00
LWC Circuit Board Assy (order instead of LWC - 1657330)* 1657332 145.00
Loop Surge Suppressor (LSS) 1657350 220.00
LSS Circuit Board Assy (order instead of LSS - 1657350)* 1657354 200.00
Continuity and Relay Tester 1657420 140.00
Loop Accessory Keys (10 spares) ** 1657379 4.00
Wrap Switch Access Cover 1657325 5.00
Electrical Box (indoor) 5cm x 10cm (1 in. x 4 in.) 2103151 1.20
Clamp (for cable to indoor box) 2100264 .10
Electrical Box (outdoor) 7cm x 11.5cm (2.75 in. x 4.5 in.) (for industrial use) 1657280 7.00
Clamp-small (for cable to indoor box) 2114285 5.00
Clamp-large (for cable to outdoor box) 1657377 5.00
Single Device Attachment Cable... 40 ft (12.1m) (8100 system only) 8269543 152.00

* For use with NEMA -4X enclosure and associated parts (used when installing in harsh environments) or as a replacement part for the LWC or LSS.

** 1 package (10 keys) shipped with each 3631, 3632, 3842, 8101, 8130 or 8140. 1 key shipped with each LWC and wrap LSC.

Ordering Instructions —
When ordering use Machine Type 3631, 3632, 8101, 8130 or 8140.
3630 SYSTEM ACCESSORIES ... cont'd

Customer Responsibilities

Warranty – All loop accessories are warranted free from defects of workmanship and materials for 90 days.

Wall Mounting Brackets [3641, 3646]

A two piece mounting bracket is available to mount the 3641 or 3646 to a wall, column, or other vertical surface. One piece mounts on the 3641 or 3646 and the other mounts on the vertical surface. There are four bracket holes on the back of the 3641 or 3646 and four mounting screws supplied with the brackets. The customer is responsible for supplying the fasteners for the wall bracket.

Ordering Instructions – For ordering for delivery with the machine see appropriate machine page. When ordering, use Machine Type 3641 or 3646.

Warranty – Wall mounting brackets are warranted free from defects of workmanship and materials for 90 days.

Magnetic Scanner Accessories

Magnetic Hand Scanner [3278, 3641, 3643, 3646, 3647]

The Magnetic Hand Scanner (MHS) attaches by a 1.5 meter coiled cable to a number of data entry and reporting devices that have an appropriate magnetic adapter feature. It allows the user to read magnetic stripe labels that are attached to shelves, cartons, machines, etc. It can also be used to read magnetic stripe tags which are hand-held or placed on a flat surface.

The MHS has three lights and an audible buzzer which provide feedback to the user on the status of the scanned data, with proper encoding the MHS can read a stripe in either direction. A magnetic reader attachment feature on the appropriate machine is required to use the Magnetic Hand Scanner.

Magnetic Slot Reader and Dual Entry Magnetic Slot Reader [3276, 3278, 3651, 3643, 3646, 3647, 8775]

The Magnetic Slot Reader (MSR) and Dual Entry Magnetic Slot Reader (DEMSR) attach by a 1.5 meter cable to a number of data entry and reporting devices that have an appropriate magnetic adapter feature. These slot readers accommodate a wide range (height and length) of magnetic striped card stock and plastic badges including: magnetic striped 80-column cards, operator identification badges, large and small credit cards, etc.

The MSR and DEMSR have three lights and an audible buzzer which provide feedback to the user on the status of scanned data. Holes in the bottom of the readers allow optional attachment to an appropriate flat surface.

The MSR has a wide opening on one end to facilitate reading of badges and documents. The DEMSR has wide openings on both ends to facilitate reading in either direction. A magnetic reader attachment feature on the appropriate machine is required to use the MSR or DEMSR.

Ordering Instructions – For ordering for delivery with the machine, see appropriate machine page. When ordering, use Machine Type 3276, 3278, 3641, 3643, 3646, 3647, 8775.

Maintenance – High densities of hard particulates may decrease head life. In this environment, customer should consider protecting the media to reduce the frequency of head assembly replacement. Where there are high densities of corrosive gases, more frequent head assembly replacement may be required.

Warranty – The Magnetic Hand Scanner, the Magnetic Slot Reader and the Dual Entry Magnetic Slot reader are warranted to be free from defects in workmanship and materials for a period of 90 days. Warranty service will be performed at the FE Repair Center. The customer will fill out a Repair Center Machine Repair Authorization Form (GX27-2981), pack, and mail it and the defective Magnetic Hand Scanner or Magnetic Slot Reader to:

IBM Corporation
Repair Center
321 Route 17
Paramus, N. J. 07652

There is no regularly scheduled preventive maintenance recommended by IBM. Primary maintenance for the MHS, MSR and/or DEMSR will be done by the customer, following the problem determination and part replacement procedures.

Optionally, the customer can obtain post-warranty maintenance on a Time and Materials basis at the IBM Repair Center, Paramus, N. J.
Magnetic Hand Scanner or Slot Reader Replacement Assemblies

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHS Sensor Head Assembly</td>
<td>4832721</td>
<td>$ 75</td>
</tr>
<tr>
<td>MHS Handle and Feedback Assembly</td>
<td>4832701</td>
<td>64</td>
</tr>
<tr>
<td>MHS Amplifier Card and Cable Assembly</td>
<td>4832727</td>
<td>116</td>
</tr>
<tr>
<td>DEMSR/MSR Arm and Sensor Head Assembly</td>
<td>4832963</td>
<td>72</td>
</tr>
<tr>
<td>MSR Base and Feedback Assembly</td>
<td>4832973</td>
<td>82</td>
</tr>
<tr>
<td>DEMSR/MSR Amplifier Card and Cable Assembly</td>
<td>4832962</td>
<td>114</td>
</tr>
<tr>
<td>MSR Cover</td>
<td>4832964</td>
<td>7</td>
</tr>
<tr>
<td>DEMSR Base and Feedback Assembly</td>
<td>4123518</td>
<td>82</td>
</tr>
<tr>
<td>DEMSR Cover</td>
<td>4123486</td>
<td>17</td>
</tr>
</tbody>
</table>

The following table lists a number of magnetic replacement assemblies the customer may want to consider stocking.

<table>
<thead>
<tr>
<th>Magnetic Hand Scanner</th>
<th>Part No.</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of MHS</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>Sensor Head Ass'y</td>
<td>P/N 4832721</td>
<td></td>
</tr>
<tr>
<td>Handle and Feedback Ass'y</td>
<td>P/N 4532701</td>
<td></td>
</tr>
<tr>
<td>Amplifier Card and Cord Ass'y</td>
<td>P/N 4832727</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>100</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>150</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>200</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Magnetic Slot Reader</th>
<th>Part No.</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of MSR</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>Arm &amp; Sensor Head Ass'y</td>
<td>P/N 4832963</td>
<td></td>
</tr>
<tr>
<td>Base and Feedback Ass'y</td>
<td>P/N 4832973</td>
<td></td>
</tr>
<tr>
<td>Amplifier Card and Cord Ass'y</td>
<td>P/N 4832962</td>
<td></td>
</tr>
<tr>
<td>Cover</td>
<td>P/N 4832964</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>100</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>150</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>200</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dual Entry Magnetic Slot Reader</th>
<th>Part No.</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of DEMSR</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>Arm &amp; Sensor Head Ass'y</td>
<td>P/N 4823963</td>
<td></td>
</tr>
<tr>
<td>Base and Feedback Ass'y</td>
<td>P/N 4123518</td>
<td></td>
</tr>
<tr>
<td>Amplifier Card and Cord Ass'y</td>
<td>P/N 4832962</td>
<td></td>
</tr>
<tr>
<td>Cover</td>
<td>P/N 4123486</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>100</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>150</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>200</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

| Warranty - Magnetic scanner replacement assemblies are warranted free from defects of workmanship or materials for 90 days. |

Magnetic Slot Reader Mounting Bracket [3647]

The mounting bracket is used to firmly attach the MSR or DEMSR to the 3647. It locks to the front cover of the 3647 by a key lock. The magnetic reader cable is coiled under the bracket.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnetic Slot Reader Mounting Bracket</td>
<td>8632451</td>
<td>$ 25</td>
</tr>
</tbody>
</table>

Ordering Instructions - For ordering for delivery with the machine see appropriate machine page. When ordering use Machine Type 3647.

Magnetic Reader Extension Cables [3641, 3643, 3646]

These cable assemblies can be used to extend the Magnetic Hand Scanner (P/N 4123495) or Magnetic Slot Reader (P/N 4123500) distances. Limitation; Extension cables cannot be plugged into other extension cables.

<table>
<thead>
<tr>
<th>Description</th>
<th>Part No.</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 meter (19.7 ft.)</td>
<td>4832966</td>
<td>$ 30</td>
</tr>
<tr>
<td>12 meter (39.4 ft.)</td>
<td>4832987</td>
<td>43</td>
</tr>
</tbody>
</table>

Note: Different length cables are available

Ordering Instructions - For ordering for delivery with the machine see appropriate machine page. When ordering, use Machine Type 3641, 3643 or 3646.

Warranty - Magnetic reader extension cables are warranted free from defects of workmanship or materials for 90 days.

3644 AUTOMATIC DATA UNIT ACCESSORIES

3644 Sensor I/O Cards

16 point Non-isolated DI – Provides 16 non-isolated input points for connection to user voltage or contact sense signals. Each point provides a high level and a low level sense capability. Input parameters are:

<table>
<thead>
<tr>
<th>Contact Sense</th>
<th>Low Level</th>
<th>High Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical 1</td>
<td>≤ 2K OHMS</td>
<td>≤ 5K OHMS</td>
</tr>
<tr>
<td>Logical 0</td>
<td>≥ 50K OHMS</td>
<td>≥ 100K OHMS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Voltage Sense</th>
<th>Low Level</th>
<th>High Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical 1</td>
<td>-24.0 to +1.0 VDC</td>
<td>0 to +9.0 VDC</td>
</tr>
<tr>
<td>Logical 0</td>
<td>+2.5 to +24.0 VDC</td>
<td>+22.5 to +52.8 VDC</td>
</tr>
</tbody>
</table>

Not to be reproduced without written permission.
16 Point Isolated DI — Provides 16 points of optically isolated digital input for connection to user signals. 250 VDC isolation is provided between user signals and the 3644. Each point provides a high level and a low level voltage-sense capability. Input parameters are:

<table>
<thead>
<tr>
<th>Low Level</th>
<th>High Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logical 1</td>
<td>+ 2.0 to + 12.0 VDC</td>
</tr>
<tr>
<td>Logical 0</td>
<td>- 12.0 to + 0.8 VDC</td>
</tr>
</tbody>
</table>

16 Point Non-isolated DO — Provides 16 NPN transistor switches in a grounded emitter configuration for switching user provided DC power to user provided devices. Each switch is capable of sinking up to 250 amps from a 52.8 volt source through a resistive load. A logical 1 written into the control register will cause the transistor to turn on. Maximum voltage drop in the on state is 0.4 volts at load currents up to 20 milliamperes and 0.6 volts at load currents up to 250 amps. If no user voltage source is attached, the card will supply an off state voltage of 5.5 volts maximum at 0 amps, and 2.4 volts minimum at .001 amps.

16 Point Isolated DO — Provides 16 NPN transistor switches in an open collector, open emitter configuration for switching user provided DC power to user provided devices. 250V DC or peak AC isolation is provided between each switch and the 3644. Each transistor switch is capable of switching up to 250 amps from a 52.8 volt source to a resistive load. A logical one written into the control register will cause the switch to turn on. Maximum voltage drop in the on state is 0.4 volts at load currents up to 20 milliamperes and 0.6 volts at load currents up to 250 milliamperes.

Analog/Digital Converter — Provides an 11 bit plus sign (12 bit total), 5 volt bi-polar, successive approximation analog to digital converter with a zero correction logic section that reduces errors caused by component aging and temperature induced offset drift. Note that the ADC must be used in conjunction with at least one multiplexor card to provide for connection of signal wires. Additional multiplexor cards may be installed to provide a greater multiplexing capability. The ADC card must be installed in the 3644 card socket 1 if it is used. The first multiplexor card must be installed in socket 2.

8 Point Reed Relay Multiplexor — Provides eight 3-wire connections for shielded differential analog input signals. Provides eight-way multiplexing for the ADC. Flying capacitor switching is used to provide + or -200 volt common mode tolerance and reduce the influence of common mode voltage to unmeasurable levels at reference conditions. The reed relay multiplexor can switch signal voltages ranging from -0.5 to +5 volts.

Current Loop Receiver/Transmitter — Provides two transmitters and two receivers for modulating and demodulating a 20 milliamp current flow. Switches are provided on the card to select speed (110, 150, 300, 600, 1200 baud), number of data bits (5, 6, 7, 8), parity (odd, even, none), and number of stop bits (1, 2). A variety of start/stop codes over a wide range of speeds is available to allow connection to bit-stream devices. If more than two current loop cards are to be used in a single 3644 consult the 3644 Component Description Manual.

Ordering Instructions — For ordering with machine see appropriate machine page.

Warranty — The 3644 Attachment Accessories are warranted free from defects in workmanship and materials for 90 days. Not to be reproduced without written permission.
ACCESSORIES

3653, 3683, 3684 CASH TILL and COVER WITH LOCK
Additional cash tills and till covers may be ordered
Note: Assembly of the Adjustable Till is a customer responsibility.

<table>
<thead>
<tr>
<th>Purchase</th>
<th>MMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>For 3653, 3683, 3684 -- Cash Till w Fixed Bill Dividers, Part No. 1850154, each (w/o cover)</td>
<td>15.00</td>
<td>NC</td>
</tr>
<tr>
<td>Cash Till w Adjustable Bill Dividers, Part No. 2493151, each (w/o cover)</td>
<td>15.00</td>
<td>NC</td>
</tr>
<tr>
<td>Cash Till Cover with lock and keys, Part No. 1851126, each</td>
<td>7.50</td>
<td>NC</td>
</tr>
</tbody>
</table>

3657 Ticket Unit HOPPER/STACKER CARTRIDGE
The 3657 is shipped with two Hopper/Stacker cartridges. Additional or replacement cartridges may be purchased.

<table>
<thead>
<tr>
<th>Purchase</th>
<th>MMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hopper/Stacker Cartridge, Part No. 5560620, each</td>
<td>17.00</td>
<td></td>
</tr>
</tbody>
</table>

3663 TILLS
The 3663 Supermarket Terminal stations are equipped with a removable till and locking cover. Additional tills and locking covers may be ordered
Specify Part No. and quantity. Note: Assembly of the Adjustable Till is a customer responsibility.

<table>
<thead>
<tr>
<th>Purchase</th>
<th>MMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3663 Till with Fixed Bill Slots, Part No. 1851117</td>
<td>21.00</td>
<td>NC</td>
</tr>
<tr>
<td>3663 Till with Adjustable Bill Slots, Part No. 1990616</td>
<td>21.00</td>
<td>NC</td>
</tr>
</tbody>
</table>

3666 WINDOW
The 3666 Checkout Scanner is equipped with a replaceable window. With use, it will tend to get scratched and need to be replaced periodically. Additional windows may be ordered Specify Part No. and quantity.

<table>
<thead>
<tr>
<th>Purchase</th>
<th>MMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>3666 Window, Part No. 5563123</td>
<td>3.00</td>
<td>NC</td>
</tr>
</tbody>
</table>

3863/3864/3865 MODEM ACCESSORIES

RACK MOUNT ADAPTER
A rack adapter that fastens inside a standard 19" EIA rack. A shelf with an inside width of 17-3/8" (441.3mm) which allows two standalone modems to be placed side by side. The adapter will fit racks with depths of 23.5" to 30" (600 to 760mm).

<table>
<thead>
<tr>
<th>Purchase</th>
<th>MMC</th>
<th>FIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rack Mount Adapter, Feature No. 6420</td>
<td>70</td>
<td></td>
</tr>
</tbody>
</table>

TAIL CIRCUIT ATTACHMENT
Allows the 3863 mdl 1 or 3864 mdl 1 to attach to a 3865 Modem mdl 1 (9600 bps) equipped with Data Multiplexing (#3260). Permits an extension of a network via a separate set of modems and a separate communications channel. Limitations: No LPDA support on tailed circuit attachments...

| Tail Circuit Attachment, Feature No. 7875 | 45 | |

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## ACCESSORIES

### 3653/3683/3684 Terminal

**KEYBOARD**

The following terms are used in the keytop descriptions.

<table>
<thead>
<tr>
<th>VERSION</th>
<th>STEM NUMBER/KEY ALIGNMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>OV</td>
<td>One/Vertical</td>
</tr>
<tr>
<td>OH</td>
<td>One/Horizontal</td>
</tr>
<tr>
<td>OHV</td>
<td>One/Vertical or Horizontal</td>
</tr>
<tr>
<td>TV</td>
<td>Two/Vertical</td>
</tr>
<tr>
<td>TH</td>
<td>Two/Horizontal</td>
</tr>
<tr>
<td>B</td>
<td>Small raised projection on keytop</td>
</tr>
<tr>
<td>C</td>
<td>Circupular, concave top on key button</td>
</tr>
<tr>
<td>M</td>
<td>Minimal concavity of circular keytop</td>
</tr>
</tbody>
</table>

### SIZE UNITS

- Single: 1 x 1
- Single: 1 x 1-1/3
- Long: 1 x 2
- Double: 1-1/3 x 2

### ENGRAVED KEYTOPS

Keytops containing pre-defined messages are available for use on the 3653/3683/3684 terminal keyboards. Blank keytops are also available for customer engraving. Keytops can be ordered by part number.

Specify part number and quantity.

### 3650/3680 RETAIL KEYTOPS

The following is a list of pre-defined keytops available in the 3650 Retail Store System nomenclature:

#### Purchase

3653/3683/3684/3684 Keytop, ea $ .40

<table>
<thead>
<tr>
<th>NAME</th>
<th>COLOR</th>
<th>SIZE</th>
<th>VERSION HEIGHT PART NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>White Square OH Std</td>
<td>1650743</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>White Square OH Std</td>
<td>1650744</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>White Square OH Std</td>
<td>1650745</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>White Square OH-B Std</td>
<td>1650746</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>White Square OH Std</td>
<td>1757346</td>
<td></td>
</tr>
<tr>
<td>1 CASH</td>
<td>White Square OH Std</td>
<td>1757346</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>White Square OH Std</td>
<td>1757347</td>
<td></td>
</tr>
<tr>
<td>3 CASH SCHK</td>
<td>White Square OH Std</td>
<td>1757348</td>
<td></td>
</tr>
<tr>
<td>4 COD</td>
<td>White Square OH Std</td>
<td>1757351</td>
<td></td>
</tr>
<tr>
<td>5 LAYBY</td>
<td>White Square OH-B Std</td>
<td>1757352</td>
<td></td>
</tr>
<tr>
<td>6 CHARGE</td>
<td>White Square OH Std</td>
<td>1757353</td>
<td></td>
</tr>
<tr>
<td>7 DEFER CHARGE</td>
<td>White Square OH Std</td>
<td>1757354</td>
<td></td>
</tr>
<tr>
<td>8 INVOICE WELFRE</td>
<td>White Square OH Std</td>
<td>1757355</td>
<td></td>
</tr>
<tr>
<td>9 G</td>
<td>White Square OH Std</td>
<td>1757356</td>
<td></td>
</tr>
<tr>
<td>8H</td>
<td>White Square OH Std</td>
<td>1762440</td>
<td></td>
</tr>
<tr>
<td>9J</td>
<td>White Square OH Std</td>
<td>1762441</td>
<td></td>
</tr>
<tr>
<td>1 A CASH</td>
<td>White Square OH Std</td>
<td>1762834</td>
<td></td>
</tr>
<tr>
<td>2 B CHECK</td>
<td>White Square OH Std</td>
<td>1762835</td>
<td></td>
</tr>
<tr>
<td>3 C CHG</td>
<td>White Square OH Std</td>
<td>1762836</td>
<td></td>
</tr>
<tr>
<td>4 D</td>
<td>White Square OH Std</td>
<td>1762837</td>
<td></td>
</tr>
<tr>
<td>5 E</td>
<td>White Square OH-B Std</td>
<td>1762838</td>
<td></td>
</tr>
<tr>
<td>6 F</td>
<td>White Square OH Std</td>
<td>1762839</td>
<td></td>
</tr>
<tr>
<td>1 CASH</td>
<td>White Square OH Std</td>
<td>1853931</td>
<td></td>
</tr>
<tr>
<td>2 SPLC</td>
<td>White Square OH Std</td>
<td>1853932</td>
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</tr>
<tr>
<td>3 S CHK</td>
<td>White Square OH Std</td>
<td>1853933</td>
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</tr>
<tr>
<td>4 COD</td>
<td>White Square OH Std</td>
<td>1853934</td>
<td></td>
</tr>
<tr>
<td>5 L WAY</td>
<td>White Square OH-B Std</td>
<td>1853935</td>
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</tr>
<tr>
<td>7 CHG B</td>
<td>White Square OH Std</td>
<td>1853937</td>
<td></td>
</tr>
<tr>
<td>8 CHG C</td>
<td>White Square OH Std</td>
<td>1853938</td>
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</tr>
<tr>
<td>9 CHG D</td>
<td>White Square OH Std</td>
<td>1853939</td>
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</tr>
<tr>
<td>6 CHG</td>
<td>White Square OH Std</td>
<td>1854111</td>
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<tr>
<td>7 TMP</td>
<td>White Square OH Std</td>
<td>1854112</td>
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</tr>
<tr>
<td>8</td>
<td>White Square OH Std</td>
<td>1854113</td>
<td></td>
</tr>
<tr>
<td>9 CTA</td>
<td>White Square OH Std</td>
<td>1854141</td>
<td></td>
</tr>
<tr>
<td>9 STORE</td>
<td>White Square OH Std</td>
<td>1854142</td>
<td></td>
</tr>
<tr>
<td>9 REG</td>
<td>White Square OH Std</td>
<td>1757364</td>
<td></td>
</tr>
<tr>
<td>7 BPA</td>
<td>White Square OH Std</td>
<td>1757365</td>
<td></td>
</tr>
<tr>
<td>8 CCA</td>
<td>White Square OH Std</td>
<td>1757366</td>
<td></td>
</tr>
<tr>
<td>9 CLUB</td>
<td>White Square OH Std</td>
<td>1757367</td>
<td></td>
</tr>
<tr>
<td>NON TAX</td>
<td>Yellow Single OH Std</td>
<td>1650749</td>
<td></td>
</tr>
<tr>
<td>RETURN</td>
<td>Yellow Single OH Std</td>
<td>1757341</td>
<td></td>
</tr>
<tr>
<td>FRACT QTY</td>
<td>White Square OH Std</td>
<td>1752442</td>
<td></td>
</tr>
<tr>
<td>NON MDSE CODE</td>
<td>Yellow Single OH Std</td>
<td>1757342</td>
<td></td>
</tr>
<tr>
<td>EMPLOYEE DISCOUNT</td>
<td>Yellow Single OH Std</td>
<td>1757343</td>
<td></td>
</tr>
<tr>
<td>RETURN</td>
<td>White Square OH Std</td>
<td>1757344</td>
<td></td>
</tr>
<tr>
<td>MISC TAX CODE</td>
<td>Yellow Single OH Std</td>
<td>1757349</td>
<td></td>
</tr>
<tr>
<td>ALLOW/MISC CREDIT</td>
<td>Yellow Single OH Std</td>
<td>1757350</td>
<td></td>
</tr>
<tr>
<td>DEPOSIT</td>
<td>Yellow Single OH Std</td>
<td>1757357</td>
<td></td>
</tr>
</tbody>
</table>

### NAME | COLOR | SIZE | VERSION | PART NO.

- **SKU** Blue Single OH Std 1762444
- **DATA ENTRY** Blue Single OH Std 1853915
- **NON MDSE CODE** Blue Single OH Std 1853917
- **RETURN CREDIT** Blue Single OH Std 1853918
- **PAYMENT** Blue Single OH Std 1853919
- **ALLOW CODE** Blue Single OH Std 1853920
- **DEPT** Blue Single OH Std 1853921
- **CLASS** Blue Single OH Std 1853921
- **NON TAX** Blue Single OH Std 1853923
- **STOCK** Blue Single OH Std 1853924
- **QTY** Blue Single OH Std 1853925
- **DISCOUNT CODE** Blue Single OH Std 1853926
- **TAX CODE** Blue Single OH Std 1853927
- **SUB** White Single OH Std 1855410
- **LOT** Blue Single OH Std 5192933
- **ITEM** Blue Single OH Std 5192937
- **NO COUPON** Blue Single OH Std 5192988
- **DISCOUNT CODE** White Single OH Std 5587654
- **DEPT** Brown Single OH Std 5587655
- **RETURN CREDIT** Brown Single OH Std 5587663
- **STOCK** Brown Single OH Std 5587664
- **ALLOW CODE** Red Single OH Std 1757074
- **R/P/M** Blue Single OH Std 1757075
- **C/U** Blue Single OH Std 1757076
- **0** White Long OH Std 1756245
- **CLEAR** White Long OH Std 1762910
- **0** White Long OH Std 1762911
- **VOID** Red Single OH Std 1756299
- **0 COUPON NO SALE** White Long OH Std 5192990
- **NO SALE** White Long TH Std 5587674
- **NO COUPON** White Double TV R-1/8 1756293
- **0** Blue Double TV R-1/8 1756292
- **TOTAL** Blue Double OV Std 1853906
- **MODIFY TICKET** Blue Double OV Std 1853907
- **ENTER** Blue Double OV Std 1853908
- **ENTER COUPON** Blue Double OV Std 5192998
- **QTY** Blue Double TV Std 5588042
- **MODIFY TICKET CASH** Blue Double TV Std 5598043
- **MODIFY TICKET CASH** Blue Double TV Std 5598047
- **SKIP FIELD** Blue Double OV Std 1757077

---

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### 3653/3663/3683/3684 Terminal Keyboard Accessories (cont'd)

#### 3663/3663/3684 SUPERMARKET KEYTOPS

The following is a list of pre-defined keytops available in the 3663/3663/3684 Supermarket nomenclature:

**Purchase**

<table>
<thead>
<tr>
<th>NAME</th>
<th>COLOR</th>
<th>SIZE</th>
<th>VERSION</th>
<th>HEIGHT PART NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOR</td>
<td>White</td>
<td>Square</td>
<td>OH-CM</td>
<td>Std 1650285</td>
</tr>
<tr>
<td>5</td>
<td>White</td>
<td>Square</td>
<td>OH-BC</td>
<td>Std 1752490</td>
</tr>
<tr>
<td>4</td>
<td>White</td>
<td>Square</td>
<td>OH-C</td>
<td>Std 1854186</td>
</tr>
<tr>
<td>6</td>
<td>White</td>
<td>Square</td>
<td>OH-C</td>
<td>Std 1854187</td>
</tr>
<tr>
<td>7</td>
<td>White</td>
<td>Square</td>
<td>OH-CM</td>
<td>Std 1854189</td>
</tr>
<tr>
<td>1</td>
<td>White</td>
<td>Square</td>
<td>OH-BC</td>
<td>Std 1854190</td>
</tr>
<tr>
<td>3</td>
<td>White</td>
<td>Square</td>
<td>OH-CM</td>
<td>Std 1854192</td>
</tr>
<tr>
<td>7</td>
<td>White</td>
<td>Square</td>
<td>OH-BC</td>
<td>Std 1854193</td>
</tr>
<tr>
<td>8</td>
<td>White</td>
<td>Square</td>
<td>OH-CM</td>
<td>Std 1854194</td>
</tr>
<tr>
<td>9</td>
<td>White</td>
<td>Square</td>
<td>OH-CM</td>
<td>Std 1854195</td>
</tr>
<tr>
<td>NO SALE</td>
<td>White</td>
<td>Single</td>
<td>OH</td>
<td>Std 1762460</td>
</tr>
<tr>
<td>VOID</td>
<td>Red</td>
<td>Single</td>
<td>OH</td>
<td>Std 1762462</td>
</tr>
<tr>
<td>DISC</td>
<td>Red</td>
<td>Single</td>
<td>OH</td>
<td>Std 1762463</td>
</tr>
<tr>
<td>REFUND</td>
<td>Red</td>
<td>Single</td>
<td>OH</td>
<td>Std 1762464</td>
</tr>
<tr>
<td>MFR COUPON N</td>
<td>Red</td>
<td>Single</td>
<td>OH</td>
<td>Std 1762465</td>
</tr>
<tr>
<td>STORE COUPON M</td>
<td>Red</td>
<td>Single</td>
<td>OH</td>
<td>Std 1762466</td>
</tr>
<tr>
<td>FOOD STAMP E</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762472</td>
</tr>
<tr>
<td>CHECK FEE</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762473</td>
</tr>
<tr>
<td>BOTTLE DEPOSIT</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762474</td>
</tr>
<tr>
<td>PRICE (BPSWD)</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762475</td>
</tr>
<tr>
<td>TAX/NO TAX</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762476</td>
</tr>
<tr>
<td>WEIGHT A(OP#)</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762478</td>
</tr>
<tr>
<td>QTY C</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762479</td>
</tr>
<tr>
<td>MEAT</td>
<td>Red</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762480</td>
</tr>
<tr>
<td>BOTTLE REFUND</td>
<td>Red</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762481</td>
</tr>
<tr>
<td>WINE</td>
<td>Red</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762482</td>
</tr>
<tr>
<td>PROD</td>
<td>Green</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762484</td>
</tr>
<tr>
<td>FLWR</td>
<td>Green</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762485</td>
</tr>
<tr>
<td>GEN MDSE</td>
<td>Green</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762487</td>
</tr>
<tr>
<td>FROZ FOOD</td>
<td>Green</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762488</td>
</tr>
<tr>
<td>DELI</td>
<td>Yellow</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762489</td>
</tr>
<tr>
<td>CHEESE</td>
<td>Yellow</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762490</td>
</tr>
<tr>
<td>BEER</td>
<td>Yellow</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762492</td>
</tr>
<tr>
<td>LIQUOR</td>
<td>Brown</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762493</td>
</tr>
<tr>
<td>TOBAC</td>
<td>Brown</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762494</td>
</tr>
<tr>
<td>NON FOOD</td>
<td>Brown</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762495</td>
</tr>
<tr>
<td>SNDRY</td>
<td>Brown</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762496</td>
</tr>
<tr>
<td>GROC</td>
<td>White</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762497</td>
</tr>
<tr>
<td>GROC TAX</td>
<td>White</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762498</td>
</tr>
<tr>
<td>GROC NON TAX</td>
<td>White</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762499</td>
</tr>
<tr>
<td>FISH</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762500</td>
</tr>
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<td>HABA</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762504</td>
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<tr>
<td>DARY</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8 1762505</td>
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<td>MFG COUPON N</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>Std 1854196</td>
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<td>MISN N</td>
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<td>Single</td>
<td>OH</td>
<td>Std 1854197</td>
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<tr>
<td>STORE COUPON M</td>
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<td>Single</td>
<td>OH</td>
<td>Std 1854198</td>
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<td>PRICE (BPSWD)</td>
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<td>Single</td>
<td>OH</td>
<td>Std 1854199</td>
</tr>
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<td>TAX/NO TAX</td>
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<td>Single</td>
<td>OH</td>
<td>Std 1854200</td>
</tr>
<tr>
<td>QTY C</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>Std 1854201</td>
</tr>
<tr>
<td>REFUND D</td>
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<td>Single</td>
<td>OH</td>
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<td>VOID J</td>
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<td>OH</td>
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<td>Single</td>
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<td>FOOD STAMP E</td>
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<td>DISC K</td>
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<td>Single</td>
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<td>CHECK F</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>Std 1854208</td>
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<td>CHECK VERIFY I</td>
<td>Blue</td>
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<td>OH</td>
<td>Std 1854209</td>
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<tr>
<td>CASH G</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>Std 1854210</td>
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<tr>
<td>NO SALE</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>Std 1854211</td>
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<tr>
<td>TAX/NO TAX</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>Std 1854212</td>
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<td>GROC</td>
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<td>Single</td>
<td>OH</td>
<td>Std 1854213</td>
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<td>PROD</td>
<td>Green</td>
<td>Single</td>
<td>OH</td>
<td>Std 1854215</td>
</tr>
<tr>
<td>DEPT 1</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>Std 1855373</td>
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<td>DEPT 2</td>
<td>Blue</td>
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<td>OH</td>
<td>Std 1855374</td>
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<td>DEPT 3</td>
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<td>OH</td>
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<td>DELI</td>
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<td>OH</td>
<td>Std 1855378</td>
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<td>DARY</td>
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<td>OH</td>
<td>Std 1855379</td>
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<td>FROZ FOOD</td>
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<td>OH</td>
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<td>LIQUOR</td>
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<td>OH</td>
<td>Std 1855381</td>
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<td>WINE</td>
<td>Blue</td>
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<td>OH</td>
<td>Std 1855382</td>
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<td>HABA</td>
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<td>OH</td>
<td>Std 1855383</td>
</tr>
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<td>TOBAC</td>
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<td>OH</td>
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<td>GEN MDSE</td>
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<td>Single</td>
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<td>Std 1855385</td>
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<td>CHECK FEE</td>
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<td>OH</td>
<td>Std 1855386</td>
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<td>FISH</td>
<td>Blue</td>
<td>Single</td>
<td>OH</td>
<td>Std 1855387</td>
</tr>
</tbody>
</table>

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ACCESSORIES

3653/3663/3683/3684 Terminal Keyboard Accessories (cont'd)

3653/3663/3683/3684 BLANK KEYTOPS

The following is a list of blank keytops which are available for customer engraving:

<table>
<thead>
<tr>
<th>COLOR</th>
<th>SIZE</th>
<th>VERSION</th>
<th>HEIGHT</th>
<th>PART NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Square</td>
<td>OH-CM</td>
<td>R-1/8</td>
<td>1648413</td>
</tr>
<tr>
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<td>Square</td>
<td>OH-CB</td>
<td>Std</td>
<td>1752491</td>
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<tr>
<td>White</td>
<td>OH</td>
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<td></td>
</tr>
<tr>
<td>White</td>
<td>OH-B</td>
<td>Std</td>
<td>1853930</td>
<td></td>
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<td>White</td>
<td>Square</td>
<td>OH-CM</td>
<td>Std</td>
<td>1854184</td>
</tr>
<tr>
<td>White</td>
<td>Square</td>
<td>OH-C</td>
<td>Std</td>
<td>1854185</td>
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<tr>
<td>White</td>
<td>Single</td>
<td>OHV</td>
<td>Std</td>
<td>1762488</td>
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<tr>
<td>Black</td>
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<td>OHV</td>
<td>Std</td>
<td>1762470</td>
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<td>Single</td>
<td>OHV</td>
<td>Std</td>
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<td>OH</td>
<td>R-1/8</td>
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<tr>
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<td>Single</td>
<td>OH</td>
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<td>Single</td>
<td>OH</td>
<td>R-1/8</td>
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<td>Single</td>
<td>OH</td>
<td>R-1/8</td>
<td>1762510</td>
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<tr>
<td>Black</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8</td>
<td>1762511</td>
</tr>
<tr>
<td>Brown</td>
<td>Single</td>
<td>OH</td>
<td>R-1/8</td>
<td>1762512</td>
</tr>
<tr>
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<td>OH</td>
<td>R-1/4</td>
<td>1762513</td>
</tr>
<tr>
<td>Red</td>
<td>Single</td>
<td>OH</td>
<td>R-1/4</td>
<td>1762514</td>
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<td>Single</td>
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<td>TH</td>
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<td>OV</td>
<td>Std</td>
<td>1853909</td>
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<td>Long</td>
<td>Std</td>
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<td>TV</td>
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<td>TV</td>
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<td>R-1/4</td>
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<td>TV</td>
<td>R-1/4</td>
<td>1648409</td>
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<td>TV</td>
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<td>TV</td>
<td>Std</td>
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<td>TV</td>
<td>Std</td>
<td>1762523</td>
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<td>Double</td>
<td>TV</td>
<td>Std</td>
<td>1762524</td>
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<td>Green</td>
<td>Double</td>
<td>TV</td>
<td>Std</td>
<td>1762525</td>
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<td>TV</td>
<td>Std</td>
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<td>TV</td>
<td>Std</td>
<td>1762528</td>
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<td>TV</td>
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<td>Double</td>
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<td>1762535</td>
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<td>White</td>
<td>Double</td>
<td>OV</td>
<td>Std</td>
<td>1854181</td>
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</table>

UNIVERSAL KEYTOPS

Keyboard accessories are available which allow the customer to define and to change the messages on the keytops on the 3653, 3663, 3683 and 3684 terminals. These accessories consist of legendable keytops and sheets of blank labels to use on these keytops.

The universal keytops come in the four standard sizes and in two heights. They consist of two parts; a white bottom button and a clear plastic cover. Blank labels for the various keytop sizes may also be ordered. These labels come in various colors and may be printed with either black or white ink. The user may define unique key button messages, print these messages on the desired color label, affix the printed color label to the white bottom key button and snap on the clear protective cover. Extra clear plastic covers are also available for use as spares.

Accessories can be ordered by part number. Specify part number and quantity.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>COLOR</th>
<th>SIZE</th>
<th>HEIGHT</th>
<th>VERSION</th>
<th>PART NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keytop</td>
<td>White</td>
<td>Square</td>
<td>Std</td>
<td>OH</td>
<td>5188767</td>
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<td>Keytop</td>
<td>White</td>
<td>Single</td>
<td>Std</td>
<td>OH</td>
<td>5188768</td>
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<td>White</td>
<td>Single</td>
<td>R-1/8</td>
<td>OH</td>
<td>5188769</td>
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<td>White</td>
<td>Long</td>
<td>Std</td>
<td>TH</td>
<td>5188770</td>
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<tr>
<td>Keytop</td>
<td>White</td>
<td>Long</td>
<td>Std</td>
<td>OV</td>
<td>5188771</td>
</tr>
<tr>
<td>Keytop</td>
<td>White</td>
<td>Double</td>
<td>Std</td>
<td>TV</td>
<td>5188774</td>
</tr>
<tr>
<td>Cover</td>
<td>Clear</td>
<td>Square</td>
<td>--</td>
<td>--</td>
<td>5188751</td>
</tr>
<tr>
<td>Cover</td>
<td>Clear</td>
<td>Single</td>
<td>--</td>
<td>--</td>
<td>5188754</td>
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<tr>
<td>Cover</td>
<td>Clear</td>
<td>Long</td>
<td>--</td>
<td>--</td>
<td>5188757</td>
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<tr>
<td>Cover</td>
<td>Clear</td>
<td>Double</td>
<td>--</td>
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<td>5188760</td>
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LABELS

Labels can be ordered by part number. Specify part number and quantity.

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<th>COLOR</th>
<th>SIZE</th>
<th>DECALS/SHEETS</th>
<th>PART NO.</th>
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<tbody>
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<td>Square</td>
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<td>5194900</td>
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<td>Labels</td>
<td>White</td>
<td>Single</td>
<td>(68 decals/sheet)</td>
<td>1756848</td>
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<tr>
<td>Labels</td>
<td>Yellow</td>
<td>Single</td>
<td>(68 decals/sheet)</td>
<td>5194901</td>
</tr>
<tr>
<td>Labels</td>
<td>Red</td>
<td>Single</td>
<td>(68 decals/sheet)</td>
<td>5194902</td>
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<td>Labels</td>
<td>Blue</td>
<td>Single</td>
<td>(68 decals/sheet)</td>
<td>5194903</td>
</tr>
<tr>
<td>Labels</td>
<td>Green</td>
<td>Single</td>
<td>(68 decals/sheet)</td>
<td>5194904</td>
</tr>
<tr>
<td>Labels</td>
<td>Brown</td>
<td>Single</td>
<td>(68 decals/sheet)</td>
<td>5194905</td>
</tr>
<tr>
<td>Labels</td>
<td>White</td>
<td>Long</td>
<td>(42 decals/sheet)</td>
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<td>White</td>
<td>Double</td>
<td>(28 decals/sheet)</td>
<td>5194907</td>
</tr>
<tr>
<td>Labels</td>
<td>Red</td>
<td>Double</td>
<td>(28 decals/sheet)</td>
<td>5194908</td>
</tr>
<tr>
<td>Labels</td>
<td>Blue</td>
<td>Double</td>
<td>(28 decals/sheet)</td>
<td>5194909</td>
</tr>
</tbody>
</table>

KEY TOPS

The key top is a small ring collar which is placed over the stem of a key button and under the key top. The collar holds the key top in the up position and prevents its use. These stops may be ordered by part number.

KEYTOP EXTRACTOR

The keytop extractor is a small plier-like device which fits between rows of key buttons. By squeezing on the handles, a firm grip is made on the keytop and it may be pulled off its stem. The customer may find this helpful when adding key stops, universal keytops, or in doing any rearranging of the keyboard.

Two keytop extractors are supplied with each 3651 controller and one extractor with each 3684 Point of Sale Control Unit. The customer may desire additional extractors. They may be ordered by part number 1647720.
ACCESSORIES

3736 ACCESSORIES
For shipment with machine, order the feature number indicated.

Paper Stacker/Tray: Holds fan-fold continuous form paper and stacks paper as it leaves the 3736 printer.

Paper Carrier: Guides paper onto the paper stacker/tray as paper leaves the 3736 printer. The paper carrier also has a tear-off blade and rod to hold continuous roll paper.

3736 ADDITIONAL PRINT WHEELS
Additional print wheels for the 3736 may be ordered quoting following part numbers, as appropriate:

<table>
<thead>
<tr>
<th>Font</th>
<th>Courier 10-pitch</th>
<th>Prestige 10-pitch</th>
<th>Prestige 12-pitch</th>
<th>Letter Gothic 12-pitch</th>
</tr>
</thead>
<tbody>
<tr>
<td>English US</td>
<td>1257503</td>
<td>1257507</td>
<td>1257504</td>
<td>1257506</td>
</tr>
<tr>
<td>ASCII</td>
<td>1257612</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Specify quantity required.

Purchase MMMC

$19 N/C

3762 DOCUMENT TRAYS
The 3762 is shipped with two document trays. Additional or replacement trays may be purchased.

Document tray, Part No. 2716872

Purchase

$12

3845/3846 ACCESSORIES
Personalization/Key Entry Unit: [3845 and 3846] One unit is needed at each site having a 3845 or 3846 for entry of the key variable, seed, and personalization data.

Personalization/Key Entry Unit ... IBM Part No. 4407908 $265 **

Mounting Plate: [3846 only] One unit is needed for each four of 3846 models 1, 2, 3, 12, 13 to permit placing the 3846 in a rack.

Mounting Plate ... IBM Part No. 6813128 30 —

Blank Panel: [3846 only] A blank panel may be ordered to cover an unused 3846 opening in the accessory mounting plate.

Blank Panel ... IBM Part No. 4409058 5 —

Battery: [3845 and 3846] A battery is needed to replace the installed battery. The replacement schedule is defined in the Principles of Operation Manual. Discharged batteries should be returned to IBM.

Battery ... IBM Part No. 1743456 17 —

** Warranty: Services are available at the designated IBM Repair Center during the 90 day warranty period, which commences 30 days following date of shipment from the Plant of Manufacture. It shall be the customer's responsibility to determine the failing unit and if the unit is still under warranty to pack it in the designated shipping container and ship it pre-paid to the designated IBM Repair Center. IBM Maintenance Agreements are not available. Field Engineering on-site service will not be provided.

3890 MICROFILM CASSETTE
The film cassette provides space for take-up of the film as well as the film supply. Capacity is 2,000 feet of .0027 polyester thin base film. The cassette must be loaded in a dark room. Disclosure specifications covering the film, cassette and core on which the film must be wound, are available from IBM Industry Relations/Product Information, Dept. 767, CHQ, Old Orchard Road, Armonk, N. Y. 10504.

Microfilm Cassette, Part No. 2647900

Purchase MMMC

$424 NC

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* Corrects prices.
ACCESSORIES

4300 PROCESSORS

Console Table, 4300 Processors: An operator workstation with modesty skirt and capabilities for two operators with two 3278 mdl 2As and room for reference material. Attachable book racks may be ordered for manual storage. They also serve as a cable control device for the 3278 mdl 2A, telephone, etc. The table, whose dimensions are 1,590mm x 815mm, is equipped with gliders. Specify color code for the Console Table, 4300 Processors (#1550).

#9161 — Willow Green
#9162 — Garnet Rose
#9163 — Sunrise Yellow
#9164 — Classic Blue
#9165 — Charcoal Brown
#9166 — Pebble Gray

<table>
<thead>
<tr>
<th>Feature</th>
<th>Purchase</th>
</tr>
</thead>
<tbody>
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<td>Console Table, 4300 Processors</td>
<td>#1550</td>
</tr>
<tr>
<td></td>
<td>$395</td>
</tr>
<tr>
<td>Bookrack and Cable Holder, 4300 Processors</td>
<td>1480</td>
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