digital

LARGE SYSTEMS PRODUCT SUMMARY

July 1979

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INTRODUCTION

The following is a summary of the additions/deletions/changes to the Large Systems Price List, January 1979:

- **SMP**--Symmetrical Multi-Processing is now available for the DECsystem-1090. Options are available that add SMP functionality to either 1090 "Model A" or "Model B" processors. See page 5 .
- **MOS on 1091**--The DECsystem-1091 takes on support of MOS memory in Q3, FY'80. The MOS-based 1091 system is called 1091-SA(SB). The 1091-P core-based system will not be available for delivery after Q3, FY'80. See page 17 .
- **MOS on 2040**--The DECSYSTEM-2040 is now configured with MOS memory. The 2040-P and 2050-P core-based systems are no longer available. The new 2040-S system is now identical to the 2060-P from both a hardware and software point of view with the one exception of the MCA20 cache memory. See page 39 .
- **EXTERNAL MOS**--MOS memory configurations in excess of 1.5 million words will soon be available on all KL10-E based systems. The prerequisite software is TOPS-10 Version 7.01, or TOPS-20 Release 4.
- **TU77**--The new TU77 magnetic tape subsystem appears here for the first time, and is now available on all LSG systems. Note that the master drive for the 2020 has a different option designation than the master for the other systems. Product availability should reach volume levels by Q3, FY'80.
- **DN22**--IBM 2780/3780/HASP-multileaving will soon be available for delivery on the DECSYSTEM-2020. It is designed to enable a 2020 with either TOPS-10 Version 7.01 or TOPS-20 Release 4 to act as a remote station to an IBM host in emulation mode, and act as a host and communicate with 2780, 3780 or HASP-multileaving style terminals in termination mode. See page 31 .
- **CABLES**--The asynchronous communication single device cable policy has been redefined in order to eliminate the inconsistencies that have existed in the past. See the CABLES section on page 66 for further details.
- **TERMINAL DISCOUNTS**--There is a new corporate-wide terminal discount schedule currently being prepared for announcement, and should be available shortly after this Product Summary is published. Watch future issues of Sales Update for this important information.

AUTO-QUOTE

AUTOMATIC QUOTATION SYSTEM PROGRAM

Pricing and configuring information for the DECsystem-1091, DECSYSTEM-2020, -2040, and -2060 product offerings are available to you on a computer program running on the Marketing Support System in Marlboro.

The Automatic Quotation System program may be used from either your own office or your customer's office. The latest product and price infomation is used.

Please refer to the June 25, 1979 issue of SALES UPDATE for complete details.

A 300 baud terminal and acoustic coupler, set to full duplex is needed. A printed quote may be otained with the use of a hard copy terminal.

The following is a brief explanation on how to use the Automatic Quotation System Program:

1. Place a telephone call to Digital in Marlboro in one of the following ways:
    - *DTN number*: 8-231-1120 or 1125.
    - *Outside Local Lines*: Call your nearest Digital office and ask the Digital Operator to complete the DTN call for you.
    - *Long Distance*: (617) 481-8851.

    When the call is complete, place the phone in the cradle of the acoustic coupler.
2. The computer will answer the following on your terminal:

    MARKETING, TOPS-20 MONITOR
    (followed by a brief system message)
3. When the "@" sign appears, type the characters that are shown in the *italicized caps* in the example:
    @ *LOG AUTO* (hit escape key)-QUOTE (password) *LSG*(hit return key)
4. The program will now start to run and will type:

    "You have logged into the DECsystem-10/DECSYSTEM-20 Automatic Quotation Program."

All you have to do from this point on, is answer the questions that the program will ask you.
If you have any further questions this program, please call or write:

Ned Somerville
DTN: 231-6539
Mail Stop: MR1-2/E78

POLICIES AND PROCEDURES

Installation

- Field Service installation costs are included in the Initial Support Package bundled with the Basic System Packages.
- Field Service installation costs are not included in system add-on hardware prices listed in the Price Insert. Please add them to your order.

Cables

Cable information is needed 60 days prior to delivery to be tested. Only those cables necessary for normal installation will be supplied with each order. Communication cables are not bundled and must be ordered separately.

Replacement cables and cables for reconfiguring systems and extending units should be ordered through Logic Products.

Lease Rates

Due to significant fluctuations in interest rates, lease quotes require written confirmation from the Product Line or Customer Financing.

Refurbished Equipment

Refurbished equipment is subject to prior sale and is available only with written delivery commitment from the Product Line. Tape drives, line printers, and card equipment are not available refurbished.

Special Equipment

Orders forwarded to Order Processing which include hardware or software not shown in this summary should be accompanied by the Product Line approval upon which the quotation was based, a copy of the quotation, and any supporting documentation.

Foreign Attachments

In the event the customer installs non-DIGITAL equipment, it will become the customer's responsibility to assure the system's performance and reliability since the interconnection of devices that are non-DIGITAL can have a marked effect on the systems performance. The system software in this case is also considered part of the entire system. Software for devices not purchased from DIGITAL will be licensed separately.

Discounts

S = Discountable under Large Systems Group Discount Agreement
N = Not discountable

Prices

All prices listed are F.O.B. DIGITAL's plant in Massachusetts and apply in the continental United States only. Prices do not include shipping or transit insurance.

Options are offered for use only with supported DIGITAL software.

Equipment is scheduled and allocated by individual Product Groups: Commercial Services Industries, Education Computer Systems, Engineering Systems Group, Government Systems Group, Laboratory Products Group, and Manufacturing & Distribution Control Product Group. Each Product Group has a "Product Line Representative" who handles equipment reservations and scheduling.

Order Processing Contacts

Technical Group Order Processing Managers

Barbara Farnsworth	Engineering Systems Group (P/L 74)
Al Kahahelis	Government Systems Group (P/L 73,76)
Brian Mullen	Laboratory Products Group (P/L 002)
Dave LaValley	Education Computer Systems (P/L 67)

Commercial Group Order Processing Managers

Bob Martin	Commercial Services Industries (P/L 78, 68, 105)
Paul Naun	Manufacturing & Distribution Control Product Group (P/L 044)

Technical Group Product Line Representatives

Hope Karl	Engineering Systems Group (P/L 74)
Sue McElroy	Government Systems Group (P/L 73,76)
Brenda Santucci	Laboratory Products Group (P/L 002)
Peg Grady	Education Computer Systems (P/L 67)

Commercial Group Product Line Representatives

Bill Boyle	Commercial Services Industries (P/L 78, 68, 105)
Joyce Kavalchuck	Manufacturing & Distribution Control Product Group (P/L 044)
Harry Manuel	Manufacturing & Distribution Control Product Group (P/L 044)

Equipment Reservations

Hardware can be reserved in anticipation of a customers Purchase Order.

Contact the appropriate Product Line Representative providing the following information:
- Salesperson's name, location, badge #, and booking center.
- Customer name and address.
- Requested delivery date. For systems, must be at least sixty days from current delivery date. For add-ons, at least thirty days from current delivery date.
- Requested equipment, including software and any inter product line options.
- Amount of allowance or discount, if applicable.
- Reservation expiration date.

Booking Information

Master Order Form.
Signed DEC contract or a purchase order from the customer with terms and conditions acceptable to DEC.
All cable requirements and floor plans. The policy on cables for systems and add-ons are outlined below.

1. System Orders:
   a. Cable/floor plan information received at least 60 days prior to shipment will guarantee the specified cables will be tested and shipped with the system.
   b. Cable information received between 30 and 60 days prior to shipment will result in correct but untested cables being shipped with the system.
   c. Cable information received less than 30 days prior to shipment will result in the system being shipped with cables used to stage the system.
2. Add-on Orders:
   a. Cable information, when applicable, must be submitted with the Master Order Form and contract or Purchase Order.

Orders submitted without meeting the above requirements will not be booked until complete.

DECsystem-1090
System & Options

1090 SYSTEM PACKAGE

- KL10-D Central Processor (includes one RH20 for disk)
- LA36 console terminal
- DN20 with 16 asynchronous lines
- One 256K word MH10 memory module
- One RP06-B disk
- Initial Support Package
- TOPS-10 Operating System License
- TOPS-10 Sources

In addition to the basic system package a mimimum system must include a magnetic tape subsystem with a 1600 bit per inch tape transport and a line printer.

INITIAL SUPPORT PACKAGE

- 10 training credits
- Hardware installation with 90-day warranty
- Software installation with 90-day warranty and 1 year SPR service
- 1 set Software Notebooks and 1 year Update service
- 5 sets of manuals

1090-PA	1090 Basic System Package, RP06, TOPS-10.
1090-PB	

1090 SYMMETRICAL MULTI-PROCESSING (SMP)

The SMP features of TOPS-10 Release 7.00 for dual KL10 central processors provides the capability of attaching and sharing memory and I/O devices between both CPUs in symmetric dual (master/master) configurations. A single reentrant copy of the monitor is used. The basic SMP product is software; it is a new version of the TOPS-10 Operating System. The hardware remains the same as with the older master/slave configurations (such as DEC-system-1099).

1090S-UA	1090 "Model A" to 1090 SMP upgrade. Includes KL10-D, KL10-PV, QH302 SMP fea-
1090S-UB	tures, and (2) M9301 Bootstraps (specify type).
1090S-UC	1090 "Model B" to 1090 SMP upgrade. Includes KL10-D, QH302 SMP features, and (2)
1090S-UD	M9301 Bootstraps (specify type).
M9301-WA	SMP bootstrap for DN87.
M9301-WB	SMP bootstrap for DN20.
QH302-Am	SMP software features for TOPS-10.

CENTRAL PROCESSOR

KL10-DA	Add-on or upgrade central processor for 1090 system. Included is one RH20 massbus
KL10-DB	controller (expandable up to 7 massbus controller and 3 communication subsystems),
	LA36 console terminal and TOPS-10 Monitor License. Cables are not included.

MEMORY

MH10-HA	128K word 1.2 microsecond memory module. Also includes 8 ports.
MH10-HB	*PREREQUISITE:* KA10, KI10, KL10
MH10-LA	256K word 1.2 microsecond memory module (one MH10-H and two MH10-E's). Also
MH10-LB	includes 8 ports.
	PREREQUISITE: KA10, KI10, KL10
MH10-E	64K words expansion module. Upgrades the MH10-HA to MH10-L.
	PREREQUISITE: MH10-H

DISK & TAPE CONTROLLERS

RH20	Massbus Controller for disks and tapes.
	The 1090 system does not contain an RH20 for the tapes. It must be ordered separately.

ADD-ON DISK PACK DRIVES

RP06-AA
RP06-AB Single access 40 million word add-on disk pack drive which also includes one RP06-P disk pack.
PREREQUISITE: RH20

RP06-BA
RP06-BB Dual access 40 million word add-on disk pack drive which also includes one RP06-P disk pack.
PREREQUISITE: RH20

RP06-C RP06 dual access kit.
PREREQUISITE: RP06-A

TU45 SERIES
MAGNETIC TAPE SUBSYSTEMS

TU45C-EC
TU45C-ED Magnetic tape subsystem including a controller and one master tape drive 9-track, 75 inches per second, 800/1600 bits per inch. (Expandable to a maximum of 4 tape drives per controller) with the addition of TU45C-EH(EJ) add-on tape drives.
PREREQUISITE: RH20

TU45 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU45C-EH
TU45C-EJ 9-track, 75 inches per second, 800/1600 bits per inch add-on magnetic tape drive.
PREREQUISITE: TU45C-EC(ED)

TU77 SERIES
MAGNETIC TAPE SUBSYSTEMS

TU77-CB
TU77-CD Magnetic tape subsystem including controller and one master tape drive 9-track, 125 inches per second, 800/1600 bits per inch. (Expandable to a maximum of 4 tape drives per controller) with the addition of TU77-AF(AJ) add-on tape drives.
PREREQUISITE: RH20

TU77 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU77-AF
TU77-AJ 9-track, 125 inches per second, 800/1600 bits per inch add-on tape drive.
PREREQUISITE: TU77-CB(CD)

TU72 SERIES
MAGNETIC TAPE SUBSYSTEMS

TX02-EC
TX02-ED Magnetic tape controller & DX20 channel for TU72 Series Tapes.
PREREQUISITE: RH20

TU72 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU72-EC
TU72-ED 9-track, 125 inches per second, 1600/6250 bits per inch add-on tape drive.
PREREQUISITE: TX02-E

TU72 SERIES
SWITCH OPTIONS

See page 73 for configurations.

TX03-EC
TX03-ED Two channel switch option and DX20 channel. Includes a BC10Z-25 cable.
PREREQUISITE: TX02-E; *TOPS-10, Release 7.01*

TX03-FB Two channel switch for (2) TX02s. Includes 4 BC10Y-25 cables.
PREREQUISITE: (2) TX02-Es; *TOPS-10, Release 7.01*

TX05-EC
TX05-ED Two control unit tape switch option and TX02. Includes BC10X-25, two BC10W-25, and two BC10Y-25 cables.
PREREQUISITE: TX02-E; *TOPS-10, Release 7.01*

TX05-FB Two control unit tape switch option. Includes BC10X-25, two BC10W-25 cables.
PREREQUISITE: (2) TX02-Es; *TOPS-10, Release 7.01*

LINE PRINTERS

LP100-DA *LP100-DB*	300 lines per minute, LP05 line printer with 64-characters **EDP** drum, 132 columns and LP100 controller.
LP100-DC *LP100-DD*	300 lines per minute, LP05 line printer with 64-characters **Scientific** drum, 132 columns and LP100 controller.
LP100-EA *LP100-EB*	240 lines per minute, LP05 line printer with 96-characters **EDP** drum, 132 columns and LP100 controller.
LP100-EC *LP100-ED*	240 lines per minute, LP05 line printer with 96-characters **Scientific** drum, 132 columns and LP100 controller.
LP100-FA *LP100-FB*	900 lines per minute, LP14 line printer with 64-characters **EDP** drum, 132 columns with long line interface, and LP100 controller.
LP100-FC *LP100-FD*	900 lines per minute, LP14 line printer with 64-characters **Scientific** drum, 132 columns with long line interface, and LP100 controller.
LP100-HA *LP100-HB*	660 lines per minute, LP14 line printer with 96-characters **EDP** drum, 132 columns with long line interface, and LP100 controller.
LP100-HC *LP100-HD*	660 lines per minute, LP14 line printer with 96-characters **Scientific** drum, 132 columns with long line interface, and LP100 controller.
LP100-BA *LP100-BB*	LP07 **Charaband** line printer with LP100 controller, 900/1200 lines per minute. Specify one or more charabands listed below.
LP07-YC	Standard Charaband containing one set of **EDP** 64-character fonts and one set of **EDP** 96-character fonts. *PREREQUISITE:* LP100-B
LP07-YA	Charaband containing two sets of **EDP** 64-character fonts. *PREREQUISITE:* LP100-B
LP07-YB	Charaband containing two sets of **EDP** 96-character fonts. *PREREQUISITE:* LP100-B
LP07-YD	Charaband one set of 64-character **EDP** fonts and one set of **Kata Kana** 49-character fonts. *PREREQUISITE:* LP100-B
LP07-YF	Charaband containing one set of **OCR-A** 64-character fonts and one set of **OCR-A** 96-character fonts. *PREREQUISITE:* LP100-B
LP07-YH	Charaband containing two sets of **Scientific** 96-character fonts. *PREREQUISITE:* LP100-B
LP07-YJ	Charaband containing one set of **EDP** 96-character fonts and one set of **Scientific** 96-character fonts. *PREREQUISITE:* LP100-B
LP07-YK	Charaband containing two sets of **Swedish/Finnish EDP** 96-character fonts. *PREREQUISITE:* LP100-B
LP07-YL	Charaband containing one set of **British EDP** 96-character fonts and one set of **British EDP** 64-character fonts. *PREREQUISITE:* LP100-B
LP07-YM	Charaband containing two sets of **Open Gothic EDP** 64-character fonts (IBM 1401). *PREREQUISITE:* LP100-B

CARD EQUIPMENT

CP10-DA   100 cards per minute punch and control.
CP10-DB   *PREREQUISITE:* BA10

CR10-FA   300 cards per minute table reader and control.
CR10-FB   *PREREQUISITE:* BA10

CR10-HA   1200 cards per minute console reader and control.
CR10-HB   *PREREQUISITE:* BA10

PAPER TAPE

PC10-CL   300 characters per second paper tape reader/50 characters per second punch includ-
PC10-CM   ing cabinet, power supplies, PC04 high-speed PTR/PTP.
           PREREQUISITE: DIA (Digital Analyzer & Monitoring Device), which is included on KL10-D.

FRONT END COMMUNICATIONS

See page 14 for configurations.

NOTE: DN87-based Communication Front Ends and options will continue to be available. See Miscellaneous Section of Product Summary.

DN20-CC   Data Communications Universal Front End with 32K words of core memory. Requires
DN20-CD   the addition of DN20-XX or DN21-XX options for synchronous and asynchronous operations.

NOTE: DN20-based Communication Front Ends do not include single device cables to asynchronous terminals or modems. They must be ordered separately. See Cable Section of Product Summary.

SYNCHRONOUS LINE INTERFACES FOR DN20

DN20-BA   Low speed synchronous line controller, including one low speed line interface expandable to 4 with the addition of DN20-BBs.
           PREREQUISITE: DN20-C

DN20-DA   Synchronous expansion drawer, including one low speed line interface expandable to 4
DN20-DB   with the addition of DN20-BBs.
           PREREQUISITE: DN20-BA

DN20-BB   Low speed synchronous line interface for speeds between 2.4Kb and 19.2Kb. (RS-232-C modem interface).
           PREREQUISITE: DN20-BA or DN20-DA

DN21-DA   Synchronous expansion drawer, including one high speed line interface expandable to
DN21-DB   4 with the addition of DN21-BAs.
           PREREQUISITE: DN20-C

DN21-BA   High speed synchronous line interface for speeds between 19.2Kb and 56Kb.
           PREREQUISITE: DN21-D

ASYNCHRONOUS LINE INTERFACES FOR DN20/TOPS-10 ONLY

DN25-EC   Asynchronous expansion cabinet and first drawer including one 8-line multiplexer.
DN25-ED   *PREREQUISITE:* DN20-C

DN25-DA   Asynchronous expansion drawer including one 8-line multiplexer, expandable to 16
DN25-DB   lines with the addition of a DN25-BA.
           PREREQUISITE: DN25-E

DN25-AA   8-line asynchronous line multiplexer and controller expandable to 16 lines with the addition of a DN25-BA.
           PREREQUISITE: DN25-AB

DN25-AB   8 line asynchronous multiplexer with distribution panel, expandable to 16 with addition of a DN25-BA.
           PREREQUISITE: DN25-D/E

DN25-BA   8 line asynchronous expansion multiplexer.
           PREREQUISITE: DN25-A/D/E

DN200 REMOTE STATION

See page 15 *for configurations.*

DN200-AA	Remote Station. Includes only the Kernel hardware and console terminal. Requires the
DN200-AB	addition of add-on options for operations.
	PREREQUISITE: DN87 or DN20

DN200 OPTIONS

DNSXX-AA   Synchronous line unit for speeds between 2.4Kb and 19.2Kb. RS-232-C interface with cable. Maximum of 2.
PREREQUISITE: DN200

DNLXX-BA   300 lines per minute, LP05 line printer with 64-character **EDP** drum, 132 columns.
DNLXX-BB   *PREREQUISITE:* DN200

DNLXX-CA   240 lines per minute, LP05 line printer with 96-character **EDP** drum, 132 columns.
DNLXX-CB   *PREREQUISITE:* DN200

DNCXX-AA   300 cards per minute card reader.
DNCXX-AB   *PREREQUISITE:* DN200

CPU PACKAGE UPGRADES TO THE DECSYSTEM 1090

1090-VA   This Upgrade Package includes the KL10-D Central Processor, RP06-B Disk, Software
1090-VB   License and Sources for TOPS-10 and monitor and the Initial Support Package.

KL10-PM   KL10-A to KL10-B Upgrades. Adds backplane wiring for up to 8 Massbus Controllers and up to 3 DTE Communication Interfaces. Installation included. Does not include channels or controllers.

KL10-PV   KL10-B to KL10-D. Upgrades KL10-B CPU to latest design. Installation included. Does not include channels or controllers.

Upgrade Policies for the DECsystem-1090

- When quoting an upgrade, the following language should be included in your quote:

  Customer agrees to pay all transportation charges connected with the return of the upgraded equipment and the delivery of the new equipment including all shipping, insurance, rigging and drayage charges. Customer warrants that as of the date of the acceptance of this offer he will convey to DIGITAL good title to the upgraded equipment will be returned to DIGITAL's Marlboro, Massachusetts, facility in good condition, fair wear and tear excepted.

- When upgrading equipment on lease, the upgrade allowances can only be applied after the customer pays off the lease for the upgraded equipment.

- Customers will be invoiced for the full selling price of all systems/options shipped in upgrade situations. When equipment is returned, credit will be issued against his account.

- Any reconfiguration or moving of equipment during the upgrade installation will be billed by Field Service on a "time and material" basis. The Cable Policy delineated in the Policy Section of this Product Summary will apply: Only those cables necessary for normal installation will be supplied. Cables for reconfiguration of the system must be quoted and ordered as separate line items on an upgrade order.

- Maintenance prices are not quoted separately. Use new system prices.

Configurators
&
Rules

DECsystem-1090-P CORE Configurator

Basic DECsystem-1090 includes:

CPU & Cache   RP06 Disk
256K Words MH10 Core Memory   16 Asynchronous Lines
One RH20 for Disks   LA36 Console

Minimum System includes the basic system plus a tape subsystem and line printer.

```
                                                                    (LP100-D/E) LP05  ⎫
                                                                    (LP100-B) LP07    ⎬ LP100
                                                                    (LP100-F/H) LP14  ⎭
                                                                        ┌──────┐  up
                                                                        │LP100 │  to
                                                                        └──────┘  3

|←──────── 1st 256K ────────→|←──────── 2nd 256K/4096K ────────→|
┌───────────┬───────────────┬─────────────┬───────────────┐
│           │   MH10-E      │             │    MH10-E     │     ┌──────┐  ⎫ LP10
│  MH10-H   ├───────────────┤   MH10-H    ├───────────────┤     │BA10 *│  ⎬ CR10-F/H
│ 128K words│   MH10-E      │             │    MH10-E     │     └──────┘  ⎭ CP10-D
├───────────┴───────────────┴─────────────┴───────┬───────┤
│               CACHE MEMORY                       │  DIA  │
├──────────────────────────────────────┬──────────┴───────┤     ┌──────┐
│   KL10-D                              │ FRONT END │COMM. │     │ PC10 │
├──────┬──────┬──────┬─────────┐        │ PROCESSOR │FRONT │     └──────┘
│ RH20 │ DISK │ RH20 │  RH20   │        │    DTE    │ END  │
│ DISK │  or  │ TAPE │  DISK   │        │           │ DTE  │
│MASSBUS│TAPE │MASSBUS│ MASSBUS │       │           │up to3│
│  5   │MASSBUS│     │         │        │           │      │
│      │  1   │      │         │        │           │      │
```

RP06-A/B
up to 8

either TU45
and/or TU77

TU45C-EC/ED
TU77-CA/CB

TU45C-EH/EJ
TU77-AF/AJ
up to 3 more

up to
8 masters

TX02-EC/ED

TU72
up to 8 drives

RP06-B

RP06-A/B
up to 7

I/O CONSOLE

DN20-CC/D

DN25-EC/D

DN25-BA

(See DN20
configurator)

DN200

1st line

SHADED AREA OPTIONAL

*The BA10 devices are not sold on 1090 but may be attached from KA or KI upgrades.

COMMUNICATIONS FRONT END (DN20) CONFIGURATOR
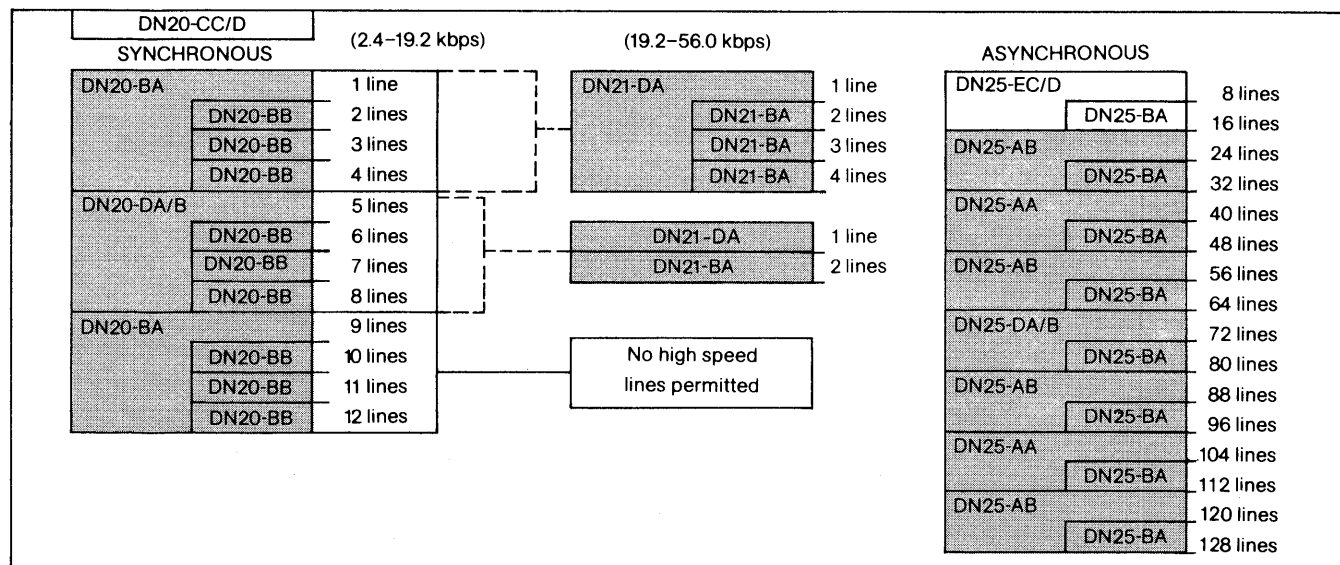
DN20-CC/D SYNCHRONOUS	(2.4–19.2 kbps)	(19.2–56.0 kbps)		ASYNCHRONOUS	
DN20-BA	1 line	DN21-DA	1 line	DN25-EC/D	8 lines
DN20-BB	2 lines	DN21-BA	2 lines	DN25-BA	16 lines
DN20-BB	3 lines	DN21-BA	3 lines	DN25-AB	24 lines
DN20-BB	4 lines	DN21-BA	4 lines	DN25-BA	32 lines
DN20-DA/B	5 lines			DN25-AA	40 lines
DN20-BB	6 lines	DN21-DA	1 line	DN25-BA	48 lines
DN20-BB	7 lines	DN21-BA	2 lines	DN25-AB	56 lines
DN20-BB	8 lines			DN25-BA	64 lines
DN20-BA	9 lines			DN25-DA/B	72 lines
DN20-BB	10 lines	No high speed		DN25-BA	80 lines
DN20-BB	11 lines	lines permitted		DN25-AB	88 lines
DN20-BB	12 lines			DN25-BA	96 lines
				DN25-AA	104 lines
				DN25-BA	112 lines
				DN25-AB	120 lines
				DN25-BA	128 lines

*If there are no low speed or asynchronous lines, you may have up to 6 high speed lines.

DN20 SYNCHRONOUS AND ASYNCHRONOUS COMBINATION RULES

Number of Synchronous Lines	Maximum Number of Asynchronous Lines
0	128
4	64
8	32
12	0

Up to 3 DN20's can be supported on 1090-P systems. The software (except DECnet-10 Task to Task) for this universal communication front end is included in the basic system package.

A separate DN20 is required to run QH061-X (2780/3780 Software) with maximum configuration of DN20-CC/CD, DN20-BA, DN20-DA/DB, (4)DN20-BB (a total of 6 bisync lines) in a single cabinet.

SHADED AREA OPTIONAL

DN200 CONFIGURATOR

DN200-A/B				
		ASYNCHRONOUS		
		DN25-AA		8 lines
			DN25-BA	16 lines
SYNCHRONOUS		DN25-AB		24 lines
DNSXX-AA*	1 line		DN25-BA	32 lines
DNSXX-AA	2 lines			

PRINTER
DNL XX-B or C

CARD READER
DNC XX-A
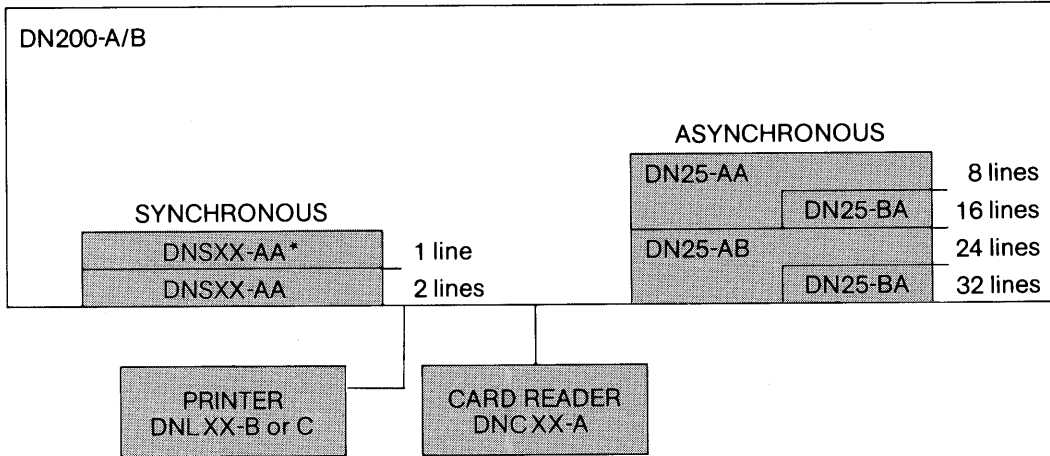
* The first DNSXX-AA is used for connecting to the system.

SHADED AREA OPTIONAL

-15-

DECsystem-1091
System & Options

1091 SYSTEM PACKAGE

- KL10-E Central Processor (includes two RH20 for disks and tapes)
- MCA20 Cache Memory
- LA36 console terminal
- 16 Asynchronous lines (Console Front End)
- 256K words MB20/MF20 memory module
- One RP06-B disk
- Initial Support Package
- TOPS-10 Operating System License
- TOPS-10 Sources

In addition to the basic system package a mimimum system must include a magnetic tape subsystem with a 1600 bit per inch tape transport and a line printer.

INITIAL SUPPORT PACKAGE

- 10 training credits
- Hardware installation with 90-day warranty
- Software installation with 90-day warranty and 1 year SPR service
- 1 set Software Notebooks and 1 year Update service
- 5 sets of manuals

1091-PA	1091 System Package with 256K words MB20 core memory, RP06, TOPS-10.
1091-PB	*(Not available for delivery after Q3, FY'80).*
1091-SA	1091 System Package with 256K words MF20 MOS memory, RP06, TOPS-10.
1091-SB	*(Not available for delivery until Q3, FY'80).*

CORE MEMORY

MB20-GC	First 64K words expansion beyond 256K words.
MB20-GD	
MB20-E	64K words expansion module. Maximum of three per MB20-G.

MOS MEMORY

MF20-LA	256K words MOS memory, space for 2 MF20-E, first backplane.
MF20-LB	*(Included in 1091-S system package, shown here for upgrade orders only.)*
MF20-LC	256K words MOS memory, space for 2 MF20-E, second backplane.
MF20-LD	
MF20-LM	256K words External MOS memory, space for 2 MF20-E, first backplane.
MF20-LN	*(Not available for delivery until Q3, FY'80).*
	PREREQUISITE: TOPS-10, Release 7.01
MF20-LK	256K words External MOS memory, space for 2 MF20-E, second backplane.
MF20-LL	*(Not available for delivery until Q3, FY'80).*
	PREREQUISITE: TOPS-10, Release 7.01
MF20-E	256K words expansion memory.
	PREREQUISITE: MF20-L

MF20 MEMORY CONFIGURATORS

Memory Size (words)	MF20-LA(LB)*	MF20-LC(LD)	MF20-LM(LN)	MF20-LK(LL)	MF20-E
256K*	1				
512K	1				1
768K	1				2
1024K	1	1			2
1280K	1	1			3
1536K	1	1			4
1792K	1	1	1		4
2048K	1	1	1		5
2304K	1	1	1		6
2560K	1	1	1	1	6
2816K	1	1	1	1	7
3072K	1	1	1	1	8

*Included in System Package--shown here for upgrades only.

DISK & TAPE CONTROLLER
RH20   Massbus Controller for disks and tapes.

ADD-ON DISK PACK DRIVES

RP06-AA   Single access 40 million word add-on disk pack drive which also includes one RP06-P
RP06-AB   disk pack.
                PREREQUISITE: RH20

RP06-BA   Dual access 40 million word add-on disk pack drive which also includes one RP06-P
RP06-BB   disk pack.
                PREREQUISITE: RH20

RP06-C   RP06 dual access kit.
                PREREQUISITE: RP06-A

TU45 SERIES
MAGNETIC TAPE SUBSYSTEMS

TU45C-EC   Magnetic tape subsystem including controller and one master tape drive, 9-track, 75
TU45C-ED   inches per second and 800/1600 bits per inch. (Expandable to a maximum of 4 tape
                drives per controller) with the addition of TU45C-EH(EJ) add-on tape drives.
                PREREQUISITE: RH20

TU45 SERIES
ADD-ON MAGNETIC TAPE DRIVE

TU45C-EH   9-track, 75 inches per second, 800/1600 bits per inch add-on magnetic tape drive.
TU45C-EJ   PREREQUISITE: TU45C-EC(ED)

TU77 SERIES
MAGNETIC TAPE SUBSYSTEMS

TU77-CB   Magnetic tape subsystem including controller and one master tape drive 9-track, 125
TU77-CD   inches per second, 800/1600 bits per inch. (Expandable to a maximum of 4 tape drives
                per controller) with the addition of TU77-AF(AJ) add-on tape drives.
                PREREQUISITE: RH20

TU77 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU77-AF 9-track, 125 inches per second, 800/1600 bits per inch add-on tape drive.
TU77-AJ *PREREQUISITE:* TU77-CB(CD)

TU72 SERIES
MAGNETIC TAPE SUBSYSTEMS

TX02-EH Magnetic tape controller and DX20 channel for TU72 series tapes.
TX02-EJ *PREREQUISITE:* RH20

TU72 SERIES
ADD-ON MAGNETIC TAPE DRIVE

TU72-EC 9-track, 125 inches per seconds, 1600/6250 bits per inch add-on tape drive.
TU72-ED *PREREQUISITE:* TX02-E

TU72 SERIES
SWITCH OPTIONS

TX03-EH Two channel switch option and DX20 channel. Includes a BC10Z-25 cable.
TX03-EJ *PREREQUISITE:* TX02-E; *TOPS-10, Release 7.01*

TX03-FB Two channel switch for (2) TX02s. Includes 4 BC10Y-25 cables.
PREREQUISITE: (2) TX02-Es; *TOPS-10, Release 7.01*

TX05-EC Two control unit tape switch option and TX02. Includes BC10X-25, two BC10W-25, and
TX05-ED two BC10Y-25 cables.
PREREQUISITE: TX02-E; *TOPS-10, Release 7.01*

TX05-FB Two control unit tape switch option. Includes BC10X-25, two BC10W-25 cables.
PREREQUISITE: (2) TX02-Es; *TOPS-10, Release 7.01*

LINE PRINTERS

LP20-AA 300 lines per minute, LP05 line printer with 64-characters **EDP** drum, 132 columns,
LP20-AB LP20 controller and cable kit.

LP20-AC 300 lines per minute, LP05 line printer with 64-character **Scientific** drum, 132 columns,
LP20-AD LP20 controller and cable kit.

LP20-BA 240 lines per minute, LP05 line printer with 96-character **EDP** drum, 132 columns, LP20
LP20-BB controller and cable kit.

LP20-BC 240 lines per minute, LP05 line printer with 96-character **Scientific** drum, 132 columns,
LP20-BD LP20 controller and cable kit.

LP20-CA 900 lines per minute, LP14 line printer with 64-character **EDP** drum, 132 columns, LP20
LP20-CB controller and cable kit.

LP20-CC 900 lines per minute, LP14 line printer with 64-character **Scientific** drum, 132 columns,
LP20-CD LP20 controller and cable kit.

LP20-DA 660 lines per minute, LP14 line printer with 96-character **EDP** drum, 132 columns, LP20
LP20-DB controller and cable kit.

LP20-DC 660 lines per minute, LP14 line printer with 96-character **Scientific** drum, 132 columns,
LP20-DD LP20 controller and cable kit.

LP200-BA LP07 **Charaband** line printer with LP20 control & cable kit, 900/1200 lines per minute.
LP200-BB Specify one or more charabands listed .

| LP07-YC | Standard Charaband containing one set of **EDP** 64-character fonts and one set of **EDP** 96-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YA | Charaband containing two sets of **EDP** 64-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YB | Charaband containing two sets of **EDP** 96-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YD | Charaband one set of 64-character **EDP** fonts and one set of **Kata Kana** 49-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YF | Charaband containing one set of **OCR-A** 64-character fonts and one set of **OCR-A** 96-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YH | Charaband containing two sets of **Scientific** 96-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YJ | Charaband containing one set of **EDP** 96-character fonts and one set of **Scientific** 96-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YK | Charaband containing one set of **Swedish/Finnish EDP** 96-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YL | Charaband containing one set of **British EDP** 96-character fonts and one set of **British EDP** 64-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YM | Charaband containing two sets of **Open Gothic EDP** 64-character fonts (IBM 1401). |
| | *PREREQUISITE:* LP200-B |

CARD EQUIPMENT

| CP20-BL | 100 cards per minute punch and control. |
| *CP20-BM* | *PREREQUISITE:* DIB20 |

| CD20-AA | 300 cards per minute table-model reader and control. |
| *CD20-AB* | |

| CD20-CA | 1200 cards per minute console-model reader and control. |
| *CD20-CB* | |

PAPER TAPE

PC20-BL	300 characters per second paper tape reader/50 characters per second punch includ-
PC20-BM	ing cabinet, power supplies, PC04 high-speed PTR/PTP.
	PREREQUISITE: DIB20

I/O BUS INTERFACE

| DIB20 | I/O Bus Interface. |

ASYNCHRONOUS LINE INTERFACES

Cables are not included with the DC20 Interfaces

| DC20-AA | Basic 8-line group, expandable to 16 lines with the addition of DC20-DA. |

| DC20-DA | 8-line asynchronous expansion group (maximum of one per DC20-AA). |
| | *PREREQUISITE:* DC20-AA |

| DC20-CD | Distribution cabinet (required for configuration between 32 and 128 lines). |
| | *PREREQUISITE:* DC20 |

DC20-EA	Communications expansion cabinet for over 32 lines--includes one DC20-AA. Can ac-
DC20-EB	commodate up to 3 additional DC20-AA.
	PREREQUISITE: DC20-CD

FRONT END COMMUNICATIONS

DN20-CC
DN20-CD   Data Communications Universal Front End with 32K words of core memory. Requires the addition of DN20-XX or DN21-XX options for synchronous and asynchronous operations.

NOTE: DN20-based Communication Front Ends do not include single device cables to asynchronous terminals or modems. They must be ordered separately. See Cable Section of Product Summary.

SYNCHRONOUS LINE INTERFACES FOR DN20

DN20-BA   Low speed synchronous line controller, including one low speed line interface expandable to 4 with the addition of DN20-BBs.
PREREQUISITE: DN20-C

DN20-DA
DN20-DB   Synchronous expansion drawer, including one low speed line interface expandable to 4 with the addition of DN20-BA.
PREREQUISITE: DN20-BA

DN20-BB   Low speed synchronous line interface for speeds between 2.4Kb and 19.2Kb. (RS-232-C modem interface).
PREREQUISITE: DN20-BA or DN20-DA

DN21-DA
DN21-DB   Synchronous expansion drawer, including one high speed line interface, expandable to 4 with the addition of DN21-BAs.
PREREQUISITE: DN20-C

DN21-BA   High speed synchronous line interface for speeds between 19.2Kb and 56Kb.
PREREQUISITE: DN21-D

ASYNCHRONOUS LINE INTERFACES FOR DN20/TOPS-10 ONLY

DN25-EC
DN25-ED   Asynchronous expansion cabinet and first drawer including one 8-line multiplexer.
PREREQUISITE: DN20-C

DN25-DA
DN25-DB   Asynchronous expansion drawer including one 8-line multiplexer, expandable to 16 lines with the addition of a DN25-BA.
PREREQUISITE: DN25-E

DN25-AA   8-line asynchronous line multiplexer and controller expandable to 16 lines with the addition of a DN25-BA.
PREREQUISITE: DN25-AB

DN25-AB   8 line asynchronous multiplexer with distribution panel, expandable to 16 with addition of a DN25-BA.
PREREQUISITE: DN25-D/E

DN25-BA   8 line asynchronous expansion multiplexer.
PREREQUISITE: DN25-A/D/E

DN200 REMOTE STATION

DN200-AA
DN200-AB   Remote Station. Includes only the Kernel hardware and console terminal. Requires the addition of add-on options for operations.
PREREQUISITE: DN87 or DN20

DN200 OPTIONS

DNSXX-A   Synchronous line unit for speeds between 2.4Kb and 19.2Kb. RS-232-C interface with cable. Maximum of 2.
PREREQUISITE: DN200

DNLXX-BA
DNLXX-BB   300 lines per minute, LP05 line printer with 64-character **EDP** drum, 132 columns.
PREREQUISITE: DN200

DNLXX-CA
DNLXX-CB   240 lines per minute, LP05 line printer with 64-character **EDP** drum, 132 columns.
PREREQUISITE: DN200

DNCXX-AA
DNCXX-AB   300 cards per minute card reader.
PREREQUISITE: DN200

Configurators
&
Rules

DECsystem-1091-P CORE Configurator

Basic DECsystem-1091 includes:

CPU & Cache
256K Words MB20 Core Memory
Two RH20 for Disks and Tapes

RP06 Disk
16 Asynchronous Lines
LA36 Console

Minimum System includes the basic system plus a tape subsystem and line printer.


```
                                                      (LP100-D/E) LP05  ⎫
                                                      (LP100-B) LP07    ⎬ LP100
                                                      (LP100-F/H) LP14  ⎭
```

|← ——— 1st 256K ——— →| |← ——— 2nd 256K ——— →|

| MB20-GA/GB | MB20-E | MB20-GC/GD #1 | MB20-E #2 |
| MB20-E | MB20-E | MB20-E #3 | MB20-E #4 |

CACHE MEMORY | DIB 20

KL10-E

| RH20 DISK MASSBUS 5 | RH20 DISK or TAPE MASSBUS 1 | RH20 TAPE MASSBUS 1 | RH20 DISK MASSBUS 1 | FRONT END UTILITY PROCESSOR DTE | (See DN20 configurator) COMM FRONT END DTE up to 3 |

LP100 — up to 3

BA10* — ⎫ LP10 / CR10-F/H / CP10-D ⎬

PC20

CP20

RP06-A/B — up to 8

either TU45 and/or TU77

TU45C-EC/ED TU77-CA/CB

TU45C-EH/EJ TU77-AF/AJ — up to 3

up to 8 masters

TX02-EH/J

TU72 — up to 8 drives

RP06-A/B — up to 7

RP06-B

I/O CONSOLE LA36

CD20

(LP20-A/B) LP05 (LP20-C/D) LP14 (LP200-B) LP07 — Up to 2

DN200 — 1st line

DC20-AA		8
	DC20-DA	16
DC20-AA		24
	DC20-DA	32
DC20-CD		
DC20-EA/EB		40
	DC20-DA	48
DC20-AA		56
	DC20-DA	64
DC20-AA		72
	DC20-DA	80
DC20-AA		88
	DC20-DA	96
DC20-EA/EB		104
	DC20-DA	112
DC20-AA		120
	DC20-DA	128

SHADED AREA OPTIONAL

*The BA10 devices and LP100 line printer are not sold on 1091 but may be attached from KA or KI upgrades. Requires the addition of a DIB20.

DECsystem-1091-S MOS Configurator

Basic DECsystem-1091 includes:

CPU & Cache	RP06 Disk
256K Words MF20 MOS Memory	16 Asynchronous Lines
Two RH20 for Disks and Tapes	LA36 Console

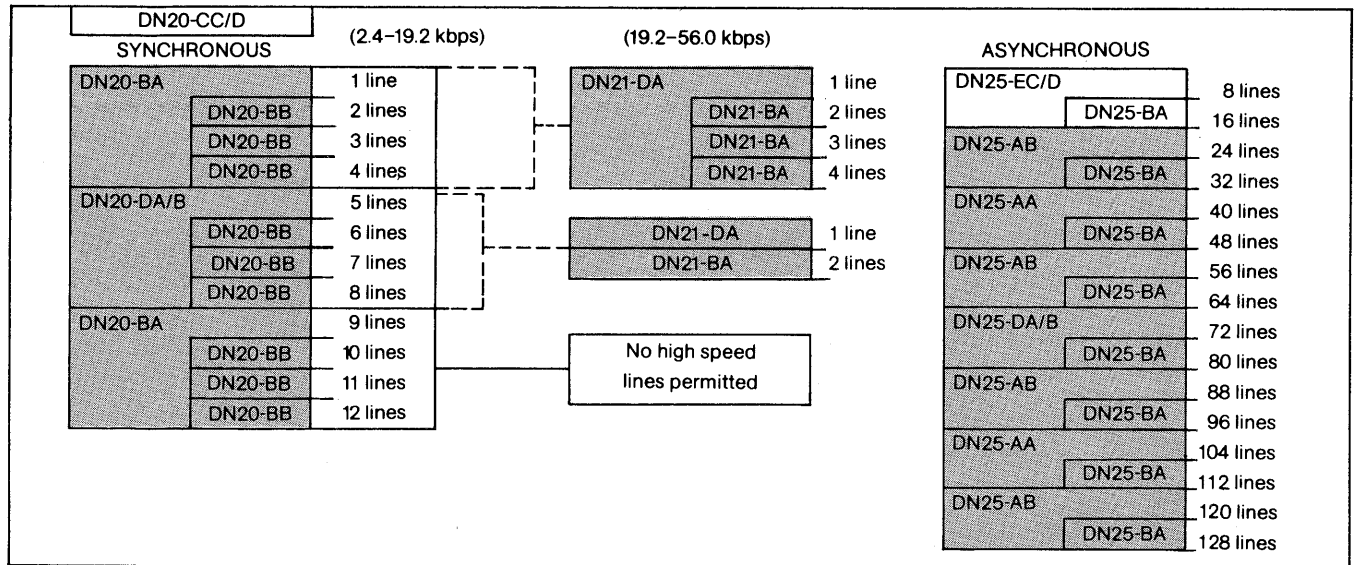Minimum System includes the basic system plus a tape subsystem and line printer.

SHADED AREA OPTIONAL

*The BA10 devices and LP100 line printer are not sold on 1091 but may be attached from KA or KI upgrades. Requires the addition of a DIB20.

**Memory sizes greater than 1536K words, require TOPS-20, Release 4.

COMMUNICATIONS FRONT END (DN20) CONFIGURATOR

DN20-CC/D SYNCHRONOUS	(2.4–19.2 kbps)	(19.2–56.0 kbps)		ASYNCHRONOUS	
DN20-BA	1 line	DN21-DA	1 line	DN25-EC/D	8 lines
DN20-BB	2 lines	DN21-BA	2 lines	DN25-BA	16 lines
DN20-BB	3 lines	DN21-BA	3 lines	DN25-AB	24 lines
DN20-BB	4 lines	DN21-BA	4 lines	DN25-BA	32 lines
DN20-DA/B	5 lines			DN25-AA	40 lines
DN20-BB	6 lines	DN21-DA	1 line	DN25-BA	48 lines
DN20-BB	7 lines	DN21-BA	2 lines	DN25-AB	56 lines
DN20-BB	8 lines			DN25-BA	64 lines
DN20-BA	9 lines			DN25-DA/B	72 lines
DN20-BB	10 lines	No high speed		DN25-BA	80 lines
DN20-BB	11 lines	lines permitted		DN25-AB	88 lines
DN20-BB	12 lines			DN25-BA	96 lines
				DN25-AA	104 lines
				DN25-BA	112 lines
				DN25-AB	120 lines
				DN25-BA	128 lines

*If there are no low speed or asynchronous lines, you may have up to 6 high speed lines.

DN20 SYNCHRONOUS AND ASYNCHRONOUS COMBINATION RULES

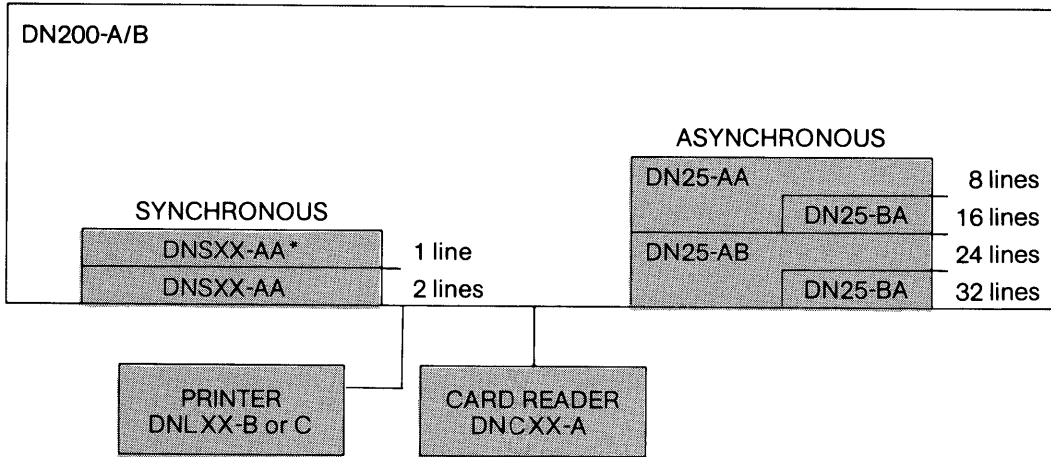| Number of Synchronous Lines	Maximum Number of Asynchronous Lines
0	128
4	64
8	32
12	0

Up to 3 DN20's can be supported on 1091-P or 1091-S systems. The software (except DECnet-10 Task to Task) for this universal communication front end is included in the basic system package.

A separate DN20 is required to run QH061-X (2780/3780 Software) with maximum configuration of DN20-CC/CD, DN20-BA, DN20-DA/DB, (4)DN20-BB (a total of 6 bisync lines) in a single cabinet.

SHADED AREA OPTIONAL

DN200 CONFIGURATOR

DN200-A/B

ASYNCHRONOUS

DN25-AA		8 lines
DN25-BA		16 lines
DN25-AB		24 lines
DN25-BA		32 lines

SYNCHRONOUS

| DNSXX-AA* | 1 line |
| DNSXX-AA | 2 lines |

PRINTER
DNLXX-B or C

CARD READER
DNCXX-A

* The first DNSXX-AA is used for connecting to the system.

DECSYSTEM-2020 Systems & Options

2020 BASIC SYSTEM PACKAGES
(Except 2020-G Packages)

TOPS-10

KS10 Central Processor

256K words MS10 Memory

One RM03 or RP06

16 Asynchronous Lines

LA36 Console Terminal

TOPS-10 Operating System

TOPS-10 Sources

Initial Support Package

25 day Consulting Services Package

TOPS-20

KS10 Central Processor

256K words MS10 Memory

One RM03 or RP06

16 Asynchronous Lines

LA36 Console Terminal

TOPS-20 Operating System

Inital Support Package

25 day Consulting Services Package

In addition to the basic system package a mimimum system must include a magnetic tape subsystem with a 1600 bit per inch tape transport and a line printer.

INITIAL SUPPORT PACKAGE

- 10 Training Credits
- Hardware installation and a 90-day warranty
- Software installation with 90-day warranty and 1 year SPR service
- 1 Set Software Notebooks and 1 year Update Service
- 5 Sets Manuals

Note: No maintenance documentation or diagnostics are provided.

2020-PA *2020-PB*	2020 Basic System Package, RM03, TOPS-20.
2020-PC *2020-PD*	2020 Basic System Package, RM03, TOPS-10.
2020-SA *2020-SB*	2020 Basic System Package, RP06, TOPS-20.
2020-SC *2020-SD*	2020 Basic System Package, RP06, TOPS-10.
2020-GE *2020-GF*	Special Bundled System Package, Including: 256K words Memory, (2) RM03 Disks, TAU45, 16 Asynchronous Lines, LA36 Terminal, Initial Support Package, 25-Day Consulting Services Package, (5) Software Units*, TOPS-20.
2020-GH *2020-GJ*	Special Bundled System Package, Including: 256K words Memory, (2) RM03 Disks, TAU45, 16 Asynchronous Lines, LA36 Terminal, Initial Support Package, 25-Day Consulting Services Package, (5) Software Units*, TOPS-10 Monitor, TOPS-10 Sources.
2020-GK *2020-GL*	Special Bundled System Package, Including: 256K words Memory, (2) RP06 Disks, TAU45, 16 Asynchronous Lines, LA36 Terminal, Initial Support Package, 25-Day Consulting Services Package, (5) Software Units*, TOPS-20.
2020-GM *2020-GN*	Special Bundled System Package, Including: 256K words Memory, (2) RP06 Disks, TAU45, 16 Asynchronous Lines, LA36 Terminal, Initial Support Package, 25-Day Consulting Services Package, (5) Software Units*, TOPS-10 Monitor, TOPS-10 Sources.

*2020-G Special Bundled System Packages **booked** with 384K words of memory will receive 6 Software Units and packages **booked** with 512K words of memory will receive 8 Software Units.

MEMORY

MS10-BA   64K words add-on MOS Memory

ADD-ON DISK PACK DRIVES

RM03-AA   Single access 67.0 megabyte top loading disk pack drive which also includes one
RM03-AD   RM03-P disk pack.

RP06-AA   Single access 40 million word add-on disk pack drive which also includes one RP06-P
RP06-AB   disk pack.

TU45 SERIES
MAGNETIC TAPE SUBSYSTEM

TAU45-EC   Magnetic tape subsystem including an RH11 tape channel, a controller and one master
TAU45-ED   tape drive 9-track, 75 inches per second, 800/1600 bits per inch. (Expandable to a
                 maximum of 4 tape drives per controller) with the addition of TU45A-EH(EJ) add-on
                 tape drives.

TU45 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU45A-EH   9-track, 75 inches per second, 800/1600 bits per inch add-on magnetic tape drive.
TU45A-EJ   *PREREQUISITE:* TAU45-E

TU77 SERIES
MAGNETIC TAPE SUBSYSTEMS

TAU77-EC   Magnetic tape subsystem including controller and one master tape drive 9-track, 125
TAU77-ED   inches per second, 800/1600 bits per inch. (Expandable to a maximum of 4 tape drives
                 per controller) with the addition of TU77-AF(AJ) add-on tape drives.

TU77 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU77-AF   9-track, 125 inches per second, 1600/800 bits per inch add-on tape drive.
TU77-AJ   *PREREQUISITE:* TAU77-EC(ED)

LINE PRINTERS

LP20-AA   300 lines per minute, LP05 line printer with 64-characters **EDP** drum, 132 columns,
LP20-AB   LP20 controller and cable kit.

LP20-AC   300 lines per minute, LP05 line printer with 64-character **Scientific** drum, 132 columns,
LP20-AD   LP20 controller and cable kit.

LP20-BA   240 lines per minute, LP05 line printer with 96-character **EDP** drum, 132 columns, LP20
LP20-BB   controller and cable kit.

LP20-BC   240 lines per minute, LP05 line printer with 96-character **Scientific** drum, 132 columns,
LP20-BD   LP20 controller and cable kit.

LP20-CA   900 lines per minute, LP14 line printer with 64-character **EDP** drum, 132 columns, LP20
LP20-CB   controller and cable kit.

LP20-CC   900 lines per minute, LP14 line printer with 64-character **Scientific** drum, 132 columns,
LP20-CD   LP20 controller and cable kit.

LP20-DA   660 lines per minute, LP14 line printer with 96-character **EDP** drum, 132 columns, LP20
LP20-DB   controller and cable kit.

LP20-DC   660 lines per minute, LP14 line printer with 96-character **Scientific** drum, 132 columns,
LP20-DD   LP20 controller and cable kit.

CARD READERS

CD20-AA   300 cards per minute table-model reader and control.
CD20-AB   *PREREQUISITE:* DNHXX-A

CD20-CA   1200 cards per minute console-model reader and control.
CD20-CB   *PREREQUISITE:* DNHXX-A

DNHXX-AA   Expansion cabinet with BA11-K and 861 power supply. Use **only** with CD20 card reader.
DNHXX-AB

SYNCHRONOUS LINE INTERFACES/TOPS-20 ONLY

DN20-BA   First synchronous line and control for speeds between 2.4Kb and 19.2Kb. (RS-232-C modem interface).

DN20-BB   Second synchronous line interface for speeds between 2.4Kb and 19.2Kb. (RS-232-C modem interface).

ASYNCHRONOUS LINE MULTIPLEXERS

DZ11-AA   Asynchronous 8-line multiplexer for EIA terminals or lines. Features programmable speeds (up to 9600 bits per second) and formats on a per-line basis. Can expand to 16 lines with an addition of a DZ11-B. Includes data set control for use with Bell-103 modems or equivalent. Cables are not included.

DZ11-BA   8-line EIA expansion multiplexer is required when more than 24 lines are ordered. Cables are not included.
                PREREQUISITE: DZ11-AA

2780/3780/HASP COMMUNICATIONS

DN22-AA   **IBM 2780/3780/HASP-Multileaving Emulator/Terminator**
DN22-AB

Hardware/software bundled subsystem acting as a remote station to an IBM host in emulation mode, or as a host communicating with 2780, 3780, or HASP multileaving terminals in termination mode. Two communication lines are provided in any mix of emulation or termination.
PREREQUISITE: DECSYSTEM-2020 running TOPS-10 Version 7.01 or TOPS-20 Release 4 and one DN20-B synchronous line from DECSYSTEM-2020 with either synchronous modems for remote use or a single synchronous null modem for local use.

Upgrade Policies from a DECSYSTEM-2020 to DECSYSTEM-2040/60

- When quoting an upgrade, the following language should be included in your quote:

  Customer agrees to pay all transportation charges connected with the return of the upgraded equipment and the delivery of the new equipment including all shipping, insurance, rigging and drayage charges. Customer warrants that as of the date of the acceptance of this offer he will convey to DIGITAL good title to the upgraded equipment will be returned to DIGITAL's Marlboro, Massachusetts, facility in good condition, fair wear and tear excepted.

- Any reconfiguration or moving of equipment during the upgrade installation will be billed by Field Service on a "time and material" basis. The Cable Policy delineated in the Policy Section of this Product Summary will apply: Only those cables necessary for normal installation will be supplied. Cables for reconfiguration of the system must be quoted and ordered as separate line items on an upgrade order.

- Maintenance prices are not quoted separately. Use new system prices.

Trade-In Equipment

(See Price Insert for allowances)

- 2020 Central Processor, First 256K words Memory, Communications Lines, Magnetic Tape Interface, Disk Interfaces, and Console
- Exchange RM03 for RP06
- 64K words Add-on Memory
- 128K words Add-on Memory
- 256K words Add-on Memory

Peripherals Upgrades

The following peripherals can be used to upgrade to the 2040/60:

RP06 (Less RH11)   TU45 (Less RH11)
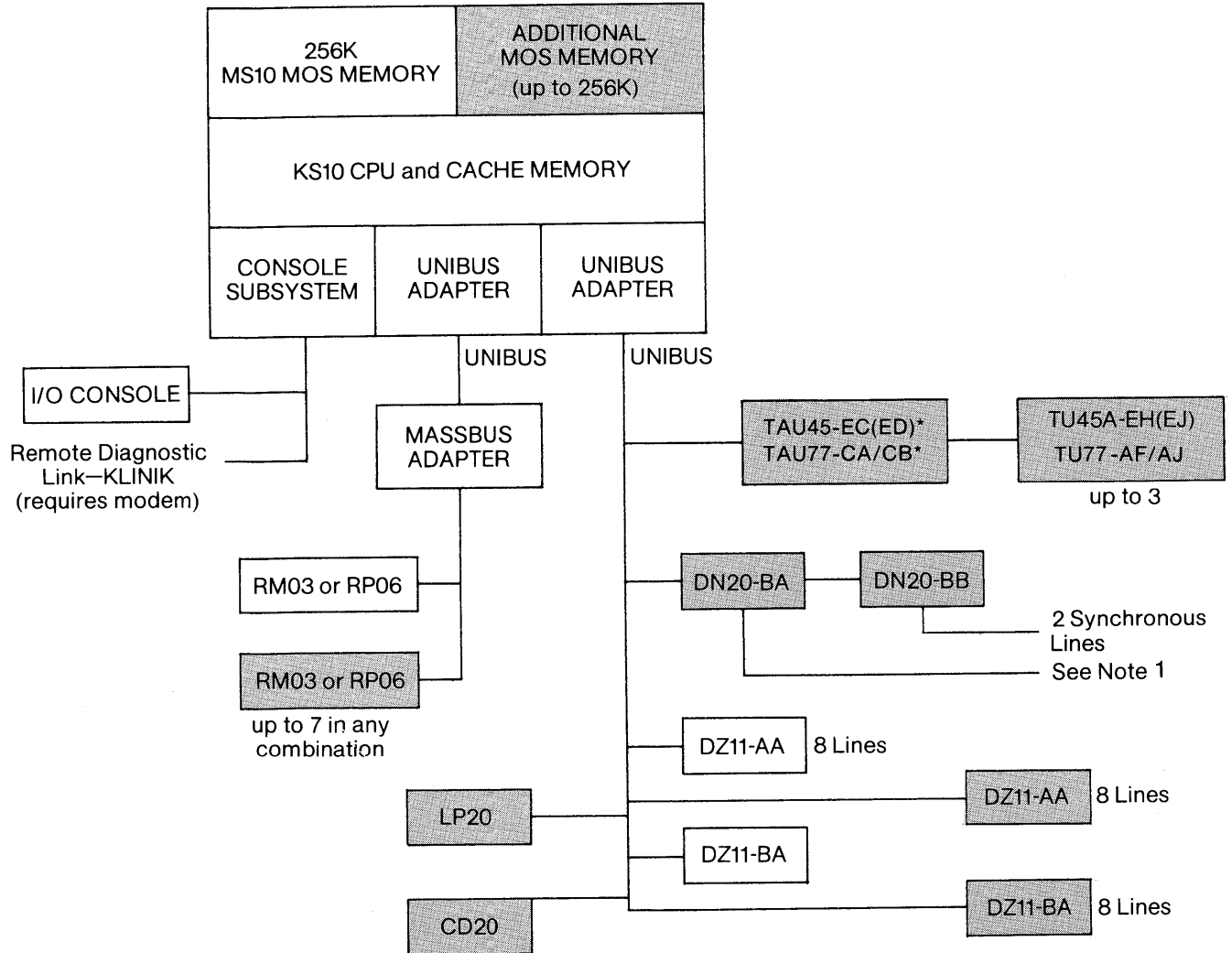
Line Printer   Card Reader

Terminal

Configurators & Rules

DECSYSTEM-2020 Configurator

Basic DECSYSTEM-2020 includes:

CPU, Console Subsystem & Cache
256K Words MS10 MOS Memory
RM03 or RP06 Disk

16 Asynchronous Lines
I/O Console
Disk Massbus Adaptor

TOPS-20 only--requires DECNET-20 software QTD20-AM.

*The TAU45 and TAU77 cannot be combined on the same UNIBUS.

SHADED AREA OPTIONAL

DECSYSTEM-2020 Configuration Rules

Memory   First 256K words are bundled in the system package. Maximum configuration is 512K words per system.

Disks   First RM03 or RP06 is bundled in the system package. RM03s and RP06s may be mixed on the same system. Maximum configuration is 8 disk drives per system. The 2020-G Special Bundled Systems are bundled with two disks.

Tapes   A TAU45 or TAU77 tape drive must be ordered separately as Field Service contracts require one TAU45 tape drive.

Line Printers   DEC Field Service contracts require a hard copy printer device. Maximum configuration is one line printer per system.

Asynchronous   Maximum configuration is 32 asynchronous lines per system.
Communications

Synchronous   Supported under TOPS-20 only. Speeds between 2.4Kb and 19.2Kb.
Communications   Maximum configuration is 2 synchronous lines.

DECSYSTEM-2040
Systems & Options

2040 SYSTEM PACKAGE

- KL10-E Central Processor (includes two RH20 for disks and tapes)
- 256K words MF20 MOS Memory
- One RP06-B Disk
- 16 Asynchronous Lines
- LA36 Console Terminal
- TOPS-20 Operating System with Extended Features
- Initial Support Package
- Consulting Services Package (50 days)

In addition to the basic system package a mimimum system must include a magnetic tape subsystem with a 1600 bit per inch tape transport and a line printer.

INITIAL SUPPORT PACKAGE

- 10 Training Credits
- Hardware installation & 90-day warranty
- Software installation with 90-day warranty and 1 year SPR service
- 1 Set Software Notebooks and 1 year Update Service
- 5 sets Manuals

NOTE: No maintenance documentation or diagnostics are provided.

2040-SA
2040-SB   2040 Basic System Package with 256K words MOS Memory, RP06, TOPS-20.

MEMORY

MF20-LA
MF20-LB   256K words MOS memory, space for 2 MF20-E, first backplane.
               (Included in 2040-S system package, shown here for upgrade orders only.)

MF20-LC
MF20-LD   256K words MOS memory, space for 2 MF20-E, second backplane.

MF20-LH
MF20-LJ   256K words External MOS memory, space for 2 MF20-E, first backplane.
               (Not available for delivery until Q3, FY'80).
               PREREQUISITE: TOPS-20, Release 4

MF20-LK
MF20-LL   256K words External MOS memory, space for 2 MF20-E, second backplane.
               (Not available for delivery until Q3, FY'80).
               PREREQUISITE: TOPS-20, Release 4

MF20-E   256K words expansion memory.
               PREREQUISITE: MF20-L

MF20 MEMORY CONFIGURATORS

Memory Size (words)	MF20-LA(LB)*	MF20-LC(LD)	MF20-LH(LJ)	MF20-LK(LL)	MF20-E
256K*	1				
512K	1				1
768K	1				2
1024K	1	1			2
1280K	1	1			3
1536K	1	1			4
1792K	1	1	1		4
2048K	1	1	1		5
2304K	1	1	1		6
2560K	1	1	1	1	6
2816K	1	1	1	1	7
3072K	1	1	1	1	8

*Included in System Package--shown here for upgrades only.

DISK & TAPE CONTROLLER

RH20   Massbus Controller for Disk and Tape.

ADD-ON DISK PACK DRIVES

RP06-AA   Single access 40 million word add-on disk pack drive which also includes one RP06-P
RP06-AB   disk pack.
       PREREQUISITE: RH20

RP06-BA   Dual access 40 million word add-on disk pack drive which also includes one RP06-P
RP06-BB   disk pack.
       PREREQUISITE: RH20

RP06-C   RP06 dual access kit.
       PREREQUISITE: RP06-A

TU45 SERIES
MAGNETIC TAPE SUBSYSTEM

TU45A-EC   Magnetic tape subsystem including controller and one master tape drive 9-track, 75
TU45A-ED   inches per second, 800/1600 bits per inch. (Expandable to a maximum of 4 tape drives
       per controller) with the addition of TU45A-EH(EJ) add-on tape drives.
       PREREQUISITE: RH20

TU45 SERIES
ADD-ON MAGNETIC TAPE DRIVE

TU45A-EH   9-track, 75 inches per second, 800/1600 bits per inch add-on magnetic tape drive.
TU45A-EJ   *PREREQUISITE:* TU45A-EC/ED

TU77 SERIES
MAGNETIC TAPE SUBSYSTEMS

TU77-CB   Magnetic tape subsystem including controller and one master tape drive 9-track, 125
TU77-CD   inches per second, 800/1600 bits per inch. (Expandable to a maximum of 4 tape drives
       per controller) with the addition of TU77-AF(AJ) add-on tape drives.
       PREREQUISITE: RH20

TU77 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU77-AF   9-track, 125 inches per second, 800/1600 bits per inch add-on tape drive.
TU77-AJ   *PREREQUISITE:* TU77-CB(CD)

TU72 SERIES
MAGNETIC TAPE SUBSYSTEMS

TX02-EE   Magnetic tape controller and DX20 channel for TU72 Series Tapes.
TX02-EF   *PREREQUISITE:* RH20

TU72 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU72-EC   9-track, 125 inches per second, 1600/6250 bits per inch add-on tape drive.
TU72-ED   *PREREQUISITE:* TX02-E

TU72 SERIES
SWITCH OPTIONS

TX03-EE	Two channel switch option and DX20 channel. Includes a BC10Z-25 cable.
TX03-EF	*PREREQUISITE:* TX02-E; TOPS-20, Release 4
TX03-FB	Two channel switch for (2) TX02s. Includes 4 BC10Y-25 cables.
	PREREQUISITE: (2) TX02-Es; TOPS-20, Release 4
TX05-EC	Two control unit tape switch option and TX02. Includes BC10X-25, two BC10W-25, and
TX05-ED	two BC10Y-25 cables.
	PREREQUISITE: TX02-E; TOPS-20, Release 4
TX05-FB	Two control unit tape switch option. Includes BC10X-25, two BC10W-25 cables.
	PREREQUISITE: (2) TX02-Es; TOPS-20, Release 4

LINE PRINTERS

LP20-AA	300 lines per minute, LP05 line printer with 64-characters **EDP** drum, 132 columns,
LP20-AB	LP20 controller and cable kit.
LP20-AC	300 lines per minute, LP05 line printer with 64-character **Scientific** drum, 132 columns,
LP20-AD	LP20 controller and cable kit.
LP20-BA	240 lines per minute, LP05 line printer with 96-character **EDP** drum, 132 columns, LP20
LP20-BB	controller and cable kit.
LP20-BC	240 lines per minute, LP05 line printer with 96-character **Scientific** drum, 132 columns,
LP20-BD	LP20 controller and cable kit.
LP20-CA	900 lines per minute, LP14 line printer with 64-character **EDP** drum, 132 columns, LP20
LP20-CB	controller and cable kit.
LP20-CC	900 lines per minute, LP14 line printer with 64-character **Scientific** drum, 132 columns,
LP20-CD	LP20 controller and cable kit.
LP20-DA	660 lines per minute, LP14 line printer with 96-character **EDP** drum, 132 columns, LP20
LP20-DB	controller and cable kit.
LP20-DC	660 lines per minute, LP14 line printer with 96-character **Scientific** drum, 132 columns,
LP20-DD	LP20 controller and cable kit.
LP200-BA	LP07 **Charaband** line printer with LP20 control & cable kit, 900/1200 lines per minute.
LP200-BB	Specify one or more charabands listed
LP07-YC	Standard Charaband containing one set of **EDP** 64-character fonts and one set of **EDP**
	96-character fonts.
	PREREQUISITE: LP200-B
LP07-YA	Charaband containing two sets of **EDP** 64-character fonts.
	PREREQUISITE: LP200-B
LP07-YB	Charaband containing two sets of **EDP** 96-character fonts.
	PREREQUISITE: LP200-B
LP07-YD	Charaband one set of 64-character **EDP** fonts and one set of **Kata Kana** 49-character
	fonts.
	PREREQUISITE: LP200-B
LP07-YF	Charaband containing one set of **OCR-A** 64-character fonts and one set of **OCR-A** 96-
	character fonts.
	PREREQUISITE: LP200-B
LP07-YH	Charaband containing two sets of **Scientific** 96-character fonts.
	PREREQUISITE: LP200-B

| LP07-YJ | Charaband containing one set of **EDP** 96-character fonts and one set of **Scientific** 96-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YK | Charaband containing one set of **Swedish/Finnish EDP** 96-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YL | Charaband containing one set of **British EDP** 96-character fonts and one set of **British EDP** 64-character fonts. |
| | *PREREQUISITE:* LP200-B |

| LP07-YM | Charaband containing two sets of **Open Gothic EDP** 64-character fonts (IBM 1401). |
| | *PREREQUISITE:* LP200-B |

CARD EQUIPMENT

| CP20-CL | 100 cards per minute punch and control. |
| *CP20-CM* | *PREREQUISITE:* DIB20 |

| CD20-AA | 300 cards per minute table-model reader and control. |
| *CD20-AB* | |

| CD20-CA | 1200 cards per minute console-model reader and control. |
| *CD20-CB* | |

PAPER TAPE

| PC20-CL | 300 characters per second paper tape reader/50 characters per second punch including cabinet, power supplies, PC04 high-speed PTR/PTP. |
| *PC20-CM* | *PREREQUISITE:* DIB20 |

I/O BUS INTERFACE

| DIB20 | I/O Bus Interface. |

ASYNCHRONOUS LINE INTERFACES

Cables are not included with the DC20 Interfaces

| DC20-AA | Basic 8-line group, expandable to 16 lines with the addition of DC20-DA. |

| DC20-DA | 8-line asynchronous expansion group (maximum of one per DC20-AA). |
| | *PREREQUISITE:* DC20-AA |

| DC20-CC | Distribution cabinet (required for configuration between 32 and 128 lines). |
| | *PREREQUISITE:* DC20 |

| DC20-EC | Communications expansion cabinet for over 32 lines--includes one DC20-AA. Can accommodate up to 3 additional DC20-AA. |
| *DC20-ED* | *PREREQUISITE:* DC20-CC |

SYNCHRONOUS FRONT END COMMUNICATIONS

| DN20-CA | Data Communications Universal Front End with 32K words of core memory. Requires the addition of DN20-xx or DN21-xx options for synchronous operations. |
| *DN20-CB* | |

| DN20-MA | Data Communications Universal Front End with 128K words of MOS memory and used with DECnet-20 Version 2. Requires the addition of DN20-xx or DN21-xx options for synchronous operations. |
| *DN20-MB* | |

| DN20-MU | 32K words to 128K words of MOS memory upgrade kit. |
| | *PREREQUISITE:* DN20-CA(CB). |

SYNCHRONOUS LINE INTERFACES FOR DN20

DN20-BA   Low speed synchronous line controller, including one low speed line interface expandable to 4 with the addition of DN20-BBs.
PREREQUISITE: DN20-C

DN20-DA
DN20-DB   Synchronous expansion drawer, including one low speed line interface expandable to 4 with the addition of DN20-BA.
PREREQUISITE: DN20-BA

DN20-BB   Low speed synchronous line interface for speeds between 2.4Kb and 19.2Kb. (RS-232-C modem interface).
PREREQUISITE: DN20-BA or DN20-DA

DN21-DA
DN21-DB   Synchronous expansion drawer, including one high speed line interface, expandable to 4 with the addition of DN21-BAs.
PREREQUISITE: DN20-C

DN21-BA   High speed synchronous line interface for speeds between 19.2Kb and 56Kb.
PREREQUISITE: DN21-D

DECSYSTEM-20 UPGRADES

2040 to 2060 Upgrade Package*

2060-UA   2040-2060 UG with MCA20, TOPS-20 Extended Features

2060-UB   2040-2060 UG with MCA20, TOPS-20 Extended Features, KLPV

2050 to 2060 Upgrade Package*

2060-UC   2050-2060 UG with TOPS-20 Extended Features

2060-UD   2050-2060 UG with TOPS-20 Extended Features, KLPV

* Contact Field Service to determine if customer requires KLPV.
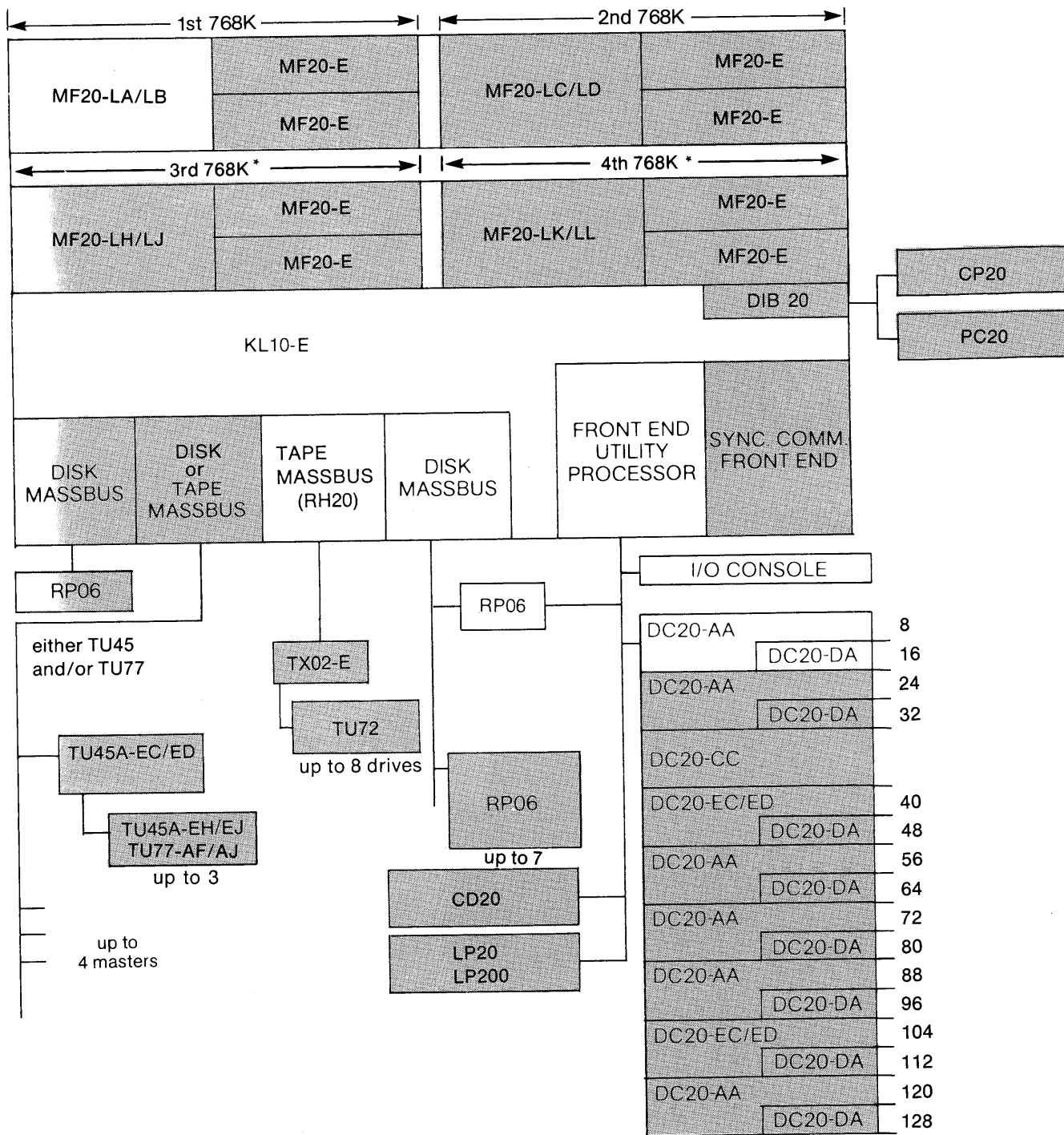
Configurators
&
Rules

DECSYSTEM-2040 Configurator

Basic DECSYSTEM-2040 includes:

CPU & Front End Processor
256K Words MF20 MOS Memory
Two RH20 for Disks and Tapes

16 Asynchronous Lines
LA36 Console
RP06

1st 768K	2nd 768K

MF20-LA/LB — MF20-E — MF20-E
MF20-LC/LD — MF20-E — MF20-E

3rd 768K *	4th 768K *

MF20-LH/LJ — MF20-E — MF20-E
MF20-LK/LL — MF20-E — MF20-E

DIB 20 — CP20 / PC20

KL10-E

DISK MASSBUS | DISK or TAPE MASSBUS | TAPE MASSBUS (RH20) | DISK MASSBUS | FRONT END UTILITY PROCESSOR | SYNC. COMM. FRONT END

RP06

either TU45 and/or TU77

TX02-E

TU45A-EC/ED

TU72

up to 8 drives

TU45A-EH/EJ
TU77-AF/AJ

up to 3

up to 4 masters

RP06

RP06

up to 7

CD20

LP20
LP200

I/O CONSOLE

DC20-AA	8
DC20-DA	16
DC20-AA	24
DC20-DA	32
DC20-CC	
DC20-EC/ED	40
DC20-DA	48
DC20-AA	56
DC20-DA	64
DC20-AA	72
DC20-DA	80
DC20-AA	88
DC20-DA	96
DC20-EC/ED	104
DC20-DA	112
DC20-AA	120
DC20-DA	128

SHADED AREA OPTIONAL

*Memory sizes greater than 1536K words, require TOPS-20, Release 4.

DECSYSTEM-20 Configuration Guidelines

	2040 MOS	2060 MOS
Relative CPU Perf.	1.0	3.0
CPU	KL10-E	KL10-E
Cache Memory	0	1
Memory K words	256-3072**	256-3072**
Disk Channels	1-3	1-7
Disk Drives/Channel	1-8	1-8
Total RP06	1-56*	1-56*
Magtape Channels	1-2	1-2
Tape Drives/Channel	1-8	1-8
Total Drives	1-16	1-16
Printers	0-2	0-2
Card Readers	0-1	0-1
Card Punch	0-1	0-1
Paper Tape	0-1	0-1
DN20	0-2	0-2
Asynch. Lines	16-128	16-128
2780/3780 Lines	0-6	0-6
DECnet Lines	0-1	0-1

*Maximum 32 structures per system. One structure equals 6 RP06s (Max.--1200MB).
**Memory configuration of greater than 1536K words will not be available until TOPS-20 Release 4.

SYNCHRONOUS COMMUNICATIONS FRONT-END (DN20)
CONFIGURATOR FOR 2040

	DN20-CA/CB	

(2.4–19.2K bps lines)

DN20-BA	1 line
DN20-BB	2 lines
DN20-BB	3 lines
DN20-BB	4 lines
DN20-DA/B	5 lines
DN20-BB	6 lines

(19.2–56K bps lines)

DN21-DA/B	1 line

No high speed lines permitted

Configuration Guidelines	2040	2060
DN20-CA/CB	0-2	0-2
2780/3780 lines	0-6	0-6
DECnet Lines	0-1	0-1

Software for the DN20-CA/CB must be ordered separately:
2780/3780 Emulator/Terminator or DECnet-20.

DECSYSTEM-20 Memory Guidelines

Memory Expansion/Exchange Guidelines

In order to expand memory it is sometimes necessary to exchange an old memory type for a newer, higher density type memory, for example, MA exchanged for MB memory.

When an exchange is required to expand memory, all of the memory in a section must be traded in to make room for the new memory.

Memory Expansion/Exchange Procedure

When a customer wants to expand memory requiring an exchange the following procedure is to be followed:

1. Determine the amount of memory which must be traded-in (usually the amount in Section B).
2. Add to this the amount of memory expansion required.
3. Select and order the memory expansion options corresponding to this total amount of memory.
4. Show as a "trade-in allowance" on the order the appropriate dollar value for the amount of memory determined in step one. Be sure to specify the type of memory being traded-in.
5. The memory ordered in Step 3 will be shipped and invoiced along with a "Return Authorization" for the memory being traded-in.
6. When the exchanged memory is returned, a credit will be issued for the amount of the trade-in allowance on the purchase order.

DECSYSTEM-2060
Systems & Options

2060 SYSTEM PACKAGE

- KL10-E Central Processor with Cache (includes two RH20 for disks and tapes)
- 256K words MF20 MOS Memory
- One RP06-B Disk
- 16 Asynchronous Lines
- LA36 Console Terminal
- TOPS-20 Operating System with Extended Features
- Initial Support Package
- Consulting Services Package (50 days)

In addition to the basic system package a mimimum system must include a magnetic tape subsystem with a 1600 bit per inch tape transport and a line printer.

INITIAL SUPPORT PACKAGE

- 10 Training Credits
- Hardware installation & 90-day warranty
- Software installation with 90-day warranty and 1 year SPR service
- 1 Set Software Notebooks and 1 year Update Service
- 5 Sets Manuals

NOTE: No maintenance documentation or diagnostics are provided.

| 2060-PA | 2060 Basic System Package with 256K words MOS Memory, RP06, TOPS-20. |
| 2060-PB | |

MEMORY

| MF20-LA | 256K words MOS memory, space for 2 MF20-E, first backplane. |
| MF20-LB | **(Included in 2060-P system package, shown here for upgrade orders only.)** |

| MF20-LC | 256K words MOS memory, space for 2 MF20-E, second backplane. |
| MF20-LD | |

MF20-LH	256K words External MOS memory, space for 2 MF20-E, first backplane.
MF20-LJ	**(Not available for delivery until Q3, FY'80).**
	PREREQUISITE: TOPS-20, Release 4

MF20-LK	256K words External MOS memory, space for 2 MF20-E, second backplane.
MF20-LL	**(Not available for delivery until Q3, FY'80).**
	PREREQUISITE: TOPS-20, Release 4

| MF20-E | 256K words expansion memory. |
| | *PREREQUISITE: MF20-L* |

MF20 MEMORY CONFIGURATORS

Memory Size (words)	MF20-LA(LB)*	MF20-LC(LD)	MF20-LH(LJ)	MF20-LK(LL)	MF20-E
256K*	1				
512K	1				1
768K	1				2
1024K	1	1			2
1280K	1	1			3
1536K	1	1			4
1792K	1	1	1		4
2048K	1	1	1		5
2304K	1	1	1		6
2560K	1	1	1	1	6
2816K	1	1	1	1	7
3072K	1	1	1	1	8

*Included in System Package--shown here for upgrades only.

DISK & TAPE CONTROLLER

RH20   Massbus Controller for Disk and Tape.

ADD-ON DISK PACK DRIVES

RP06-AA
RP06-AB   Single access 40 million word add-on disk pack drive which also includes one RP06-P disk pack.
PREREQUISITE: RH20

RP06-BA
RP06-BB   Dual access 40 million word add-on disk pack drive which also includes one RP06-P disk pack.
PREREQUISITE: RH20

RP06-C   RP06 dual access kit.
PREREQUISITE: RP06-A

TU45 SERIES
MAGNETIC TAPE SUBSYSTEM

TU45A-EC
TU45A-ED   Magnetic tape subsystem including controller and one master tape drive 9-track, 75 inches per second, 800/1600 bits per inch. (Expandable to a maximum of 4 tape drives per controller) with the addition of TU45A-EH(EJ) add-on tape drives.
PREREQUISITE: RH20

TU45
ADD-ON MAGNETIC TAPE DRIVES

TU45A-EH
TU45A-EJ   9-track, 75 inches per second, 800/1600 bits per inch add-on magnetic tape drive.
PREREQUISITE: TU45A-EC(ED)

TU77 SERIES
MAGNETIC TAPE SUBSYSTEMS

TU77-CB
TU77-CD   Magnetic tape subsystem including controller and one master tape drive 9-track, 125 inches per second, 1600/800 bits per inch. (Expandable to a maximum of 4 tape drives per controller) with the addition of TU77-AF(AJ) add-on tape drives.
PREREQUISITE: RH20

TU77 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU77-AF
TU77-AJ   9-track, 125 inches per second, 1600/800 bits per inch add-on tape drive.
PREREQUISITE: TU77-CB(CD)

TU72 SERIES
MAGNETIC TAPE SUBSYSTEM

TX02-EE
TX02-EF   Magnetic tape controller and DX20 channel for TU72 Series Tapes.
PREREQUISITE: RH20

TU72 SERIES
ADD-ON MAGNETIC TAPE DRIVES

TU72-EC
TU72-ED   9-track, 125 inches per second, 1600/6250 bits per inch add-on tape drive.
PREREQUISITE: TX02-E

TU72 SERIES
SWITCH OPTIONS

TX03-EE
TX03-EF   Two channel switch option and DX20 channel. Includes a BC10Z-25 cable.
PREREQUISITE: TX02-E; TOPS-20, Release 4

TX03-FB   Two channel switch for (2) TX02s. Includes 4 BC10Y-25 cables.
PREREQUISITE: (2) TX02-Es; TOPS-20, Release 4

TX05-EC
TX05-ED   Two control unit tape switch option and TX02. Includes BC10X-25, two BC10W-25, and two BC10Y-25 cables.
PREREQUISITE: TX02-E; TOPS-20, Release 4

TX05-FB   Two control unit tape switch option. Includes BC10X-25, two BC10W-25 cables.
PREREQUISITE: (2) TX02-Es; TOPS-20, Release 4

LINE PRINTERS

LP20-AA
LP20-AB
300 lines per minute, LP05 line printer with 64-characters **EDP** drum, 132 columns, LP20 controller and cable kit.

LP20-AC
LP20-AD
300 lines per minute, LP05 line printer with 64-character **Scientific** drum, 132 columns, LP20 controller and cable kit.

LP20-BA
LP20-BB
240 lines per minute, LP05 line printer with 96-character **EDP** drum, 132 columns, LP20 controller and cable kit.

LP20-BC
LP20-BD
240 lines per minute, LP05 line printer with 96-character **Scientific** drum, 132 columns, LP20 controller and cable kit.

LP20-CA
LP20-CB
900 lines per minute, LP14 line printer with 64-character **EDP** drum, 132 columns, LP20 controller and cable kit.

LP20-CC
LP20-CD
900 lines per minute, LP14 line printer with 64-character **Scientific** drum, 132 columns, LP20 controller and cable kit.

LP20-DA
LP20-DB
660 lines per minute, LP14 line printer with 96-character **EDP** drum, 132 columns, LP20 controller and cable kit.

LP20-DC
LP20-DD
660 lines per minute, LP14 line printer with 96-character **Scientific** drum, 132 columns, LP20 controller and cable kit.

LP200-BA
LP200-BB
LP07 **Charaband** line printer with LP20 control & cable kit, 900/1200 lines per minute. Specify one or more charabands listed below.

LP07-YC
Standard Charaband containing one set of **EDP** 64-character fonts and one set of **EDP** 96-character fonts.
PREREQUISITE: LP200-B

LP07-YA
Charaband containing two sets of **EDP** 64-character fonts.
PREREQUISITE: LP200-B

LP07-YB
Charaband containing two sets of **EDP** 96-character fonts.
PREREQUISITE: LP200-B

LP07-YD
Charaband one set of 64-character **EDP** fonts and one set of **Kata Kana** 49-character fonts.
PREREQUISITE: LP200-B

LP07-YF
Charaband containing one set of **OCR-A** 64-character fonts and one set of **OCR-A** 96-character fonts.
PREREQUISITE: LP200-B

LP07-YH
Charaband containing two sets of **Scientific** 96-character fonts.
PREREQUISITE: LP200-B

LP07-YJ
Charaband containing one set of **EDP** 96-character fonts and one set of **Scientific** 96-character fonts.
PREREQUISITE: LP200-B

LP07-YK
Charaband containing one set of **Swedish/Finnish EDP** 96-character fonts.
PREREQUISITE: LP200-B

LP07-YL
Charaband containing one set of **British EDP** 96-character fonts and one set of **British EDP** 64-character fonts.
PREREQUISITE: LP200-B

LP07-YM
Charaband containing two sets of **Open Gothic EDP** 64-character fonts (IBM 1401).
PREREQUISITE: LP200-B

CARD EQUIPMENT

CP20-CL   100 cards per minute punch and control.
CP20-CM   *PREREQUISITE:* DIB20

CD20-AA   300 cards per minute table-model reader and control.
CD20-AB

CD20-CA   1200 cards per minute console-model reader and control.
CD20-CB

PAPER TAPE

PC20-CL   300 characters per second paper tape reader/50 characters per second punch includ-
PC20-CM   ing cabinet, power supplies, PC04 high-speed PTR/PTP.
            PREREQUISITE: DIB20

I/O BUS INTERFACE

DIB20   I/O Bus Interface.

ASYNCHRONOUS LINE INTERFACES

Cables are not included with the DC20 Interfaces

DC20-AA   Basic 8-line group, expandable to 16 lines with the addition of DC20-DA.

DC20-DA   8-line asynchronous expansion group (maximum of one per DC20-AA).
            PREREQUISITE: DC20-AA

DC20-CC   Distribution cabinet (required for configuration between 32 and 128 lines).
            PREREQUISITE: DC20

DC20-EC   Communications expansion cabinet for over 32 lines--includes one DC20-AA. Can ac-
DC20-ED   commodate up to 3 additional DC20-AA.
            PREREQUISITE: DC20-CD

SYNCHRONOUS FRONT END COMMUNICATIONS

DN20-CA   Data Communications Universal Front End with 32K words of core memory. Requires
DN20-CB   the addition of DN20-xx or DN21-xx options for synchronous operations.

DN20-MA   Data Communications Universal Front End with 128K words of MOS memory and used
DN20-MB   with DECnet-20 Version 2. Requires the addition of DN20-xx or DN21-xx options for
            synchronous operations.

DN20-MU   32K words to 128K words of MOS memory upgrade kit.
            PREREQUISITE: DN20-CA(CB).

SYNCHRONOUS LINE INTERFACES FOR DN20

See page 61 for configurations.

DN20-BA   Low speed synchronous line controller, including one low speed line interface expand-
            able to 4 with the addition of DN20-BBs.
            PREREQUISITE: DN20-C

DN20-DA   Synchronous expansion drawer, including one low speed line interface expandable to 4
DN20-DB   with the addition of DN20-BA.
            PREREQUISITE: DN20-BA

DN20-BB   Low speed synchronous line interface for speeds between 2.4Kb and 19.2Kb. (RS-232-
            C modem interface).
            PREREQUISITE: DN20-BA or DN20-DA

DN21-DA   Synchronous expansion drawer, including one high speed line interface, expandable to
DN21-DB   4 with the addition of DN21-BAs.
            PREREQUISITE: DN20-C

DN21-BA   High speed synchronous line interface for speeds between 19.2Kb and 56Kb.
            PREREQUISITE: DN21-D

DECSYSTEM-20 UPGRADES

2040 to 2060 Upgrade Package*

2060-UA   2040-2060 UG with MCA20, TOPS-20 Extended Features

2060-UB   2040-2060 UG with MCA20, TOPS-20 Extended Features, KLPV

2050 to 2060 Upgrade Package*

2060-UC   2050-2060 UG with TOPS-20 Extended Features

2060-UD   2050-2060 UG with TOPS-20 Extended Features, KLPV

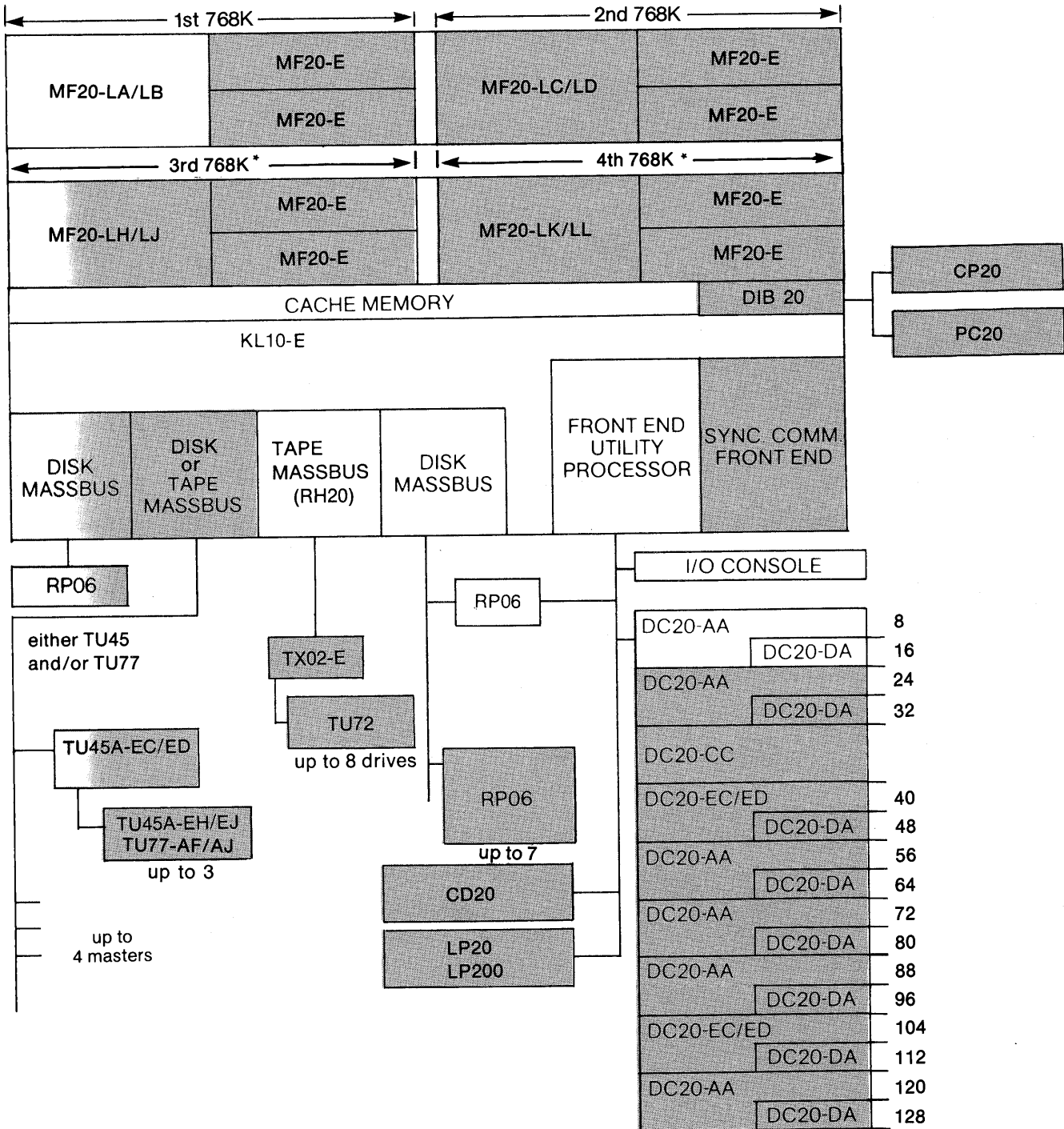* Contact Field Service to determine if customer requires KLPV.

Configurators
&
Rules

DECSYSTEM -2060 Configurator

Basic DECSYSTEM-2060 includes:

CPU & Front End Processor
256K Words MF20 MOS Memory
Cache Memory
Two RH20 for Disks and Tapes

RP06 Disk
16 Asynchronous Lines
LA36 Console

1st 768K		2nd 768K	
MF20-LA/LB	MF20-E	MF20-LC/LD	MF20-E
	MF20-E		MF20-E

3rd 768K *		4th 768K *	
MF20-LH/LJ	MF20-E	MF20-LK/LL	MF20-E
	MF20-E		MF20-E

CACHE MEMORY   DIB 20   CP20

KL10-E   PC20

| DISK MASSBUS | DISK or TAPE MASSBUS | TAPE MASSBUS (RH20) | DISK MASSBUS | FRONT END UTILITY PROCESSOR | SYNC. COMM. FRONT END |

RP06

either TU45
and/or TU77

RP06

TX02-E

TU45A-EC/ED

TU72

up to 8 drives

TU45A-EH/EJ
TU77-AF/AJ
up to 3

RP06

up to 7

up to
4 masters

CD20

LP20
LP200

I/O CONSOLE

DC20-AA		8
	DC20-DA	16
DC20-AA		24
	DC20-DA	32
DC20-CC		
DC20-EC/ED		40
	DC20-DA	48
DC20-AA		56
	DC20-DA	64
DC20-AA		72
	DC20-DA	80
DC20-AA		88
	DC20-DA	96
DC20-EC/ED		104
	DC20-DA	112
DC20-AA		120
	DC20-DA	128

SHADED AREA OPTIONAL

*Memory sizes greater than 1536K words, require TOPS-20, Release 4.

DECSYSTEM-20 Configuration Guidelines

	2040 MOS	2060 MOS
Relative CPU Perf.	1.0	3.0
CPU	KL10-E	KL10-E
Cache Memory	0	1
Memory K words	256-3072**	256-3072**
Disk Channels	1-3	1-7
Disk Drives/Channel	1-8	1-8
Total RP06	1-56*	1-56*
Magtape Channels	1-2	1-2
Tape Drives/Channel	1-8	1-8
Total Drives	1-16	1-16
Printers	0-2	0-2
Card Readers	0-1	0-1
Card Punch	0-1	0-1
Paper Tape	0-1	0-1
DN20	0-2	0-2
Asynch. Lines	16-128	16-128
2780/3780 Lines	0-6	0-6
DECnet Lines	0-1	0-1

*Maximum 32 structures per system. One structure equals 6 RP06s (Max.--1200MB).
**Memory configuration of greater than 1536K words will not be available until TOPS-20 Release 4.

SYNCHRONOUS COMMUNICATIONS FRONT-END (DN20)
CONFIGURATOR FOR 2060

```
┌──────────────────────────────────────────────────────────────────────────────┐
│   ┌─────────────────────┐                                                      │
│   │     DN20-CA/CB       │                                                     │
│   └─────────────────────┘                                                      │
│                                                                                │
│   (2.4–19.2K bps lines)                                                        │
│   ┌─────────────────┬─────────┐                                               │
│   │    DN20-BA       │ 1 line  │                                               │
│   │                  ├─────────┤        (19.2–56K bps lines)                   │
│   │  ┌────────────┐  │ 2 lines │      ┌─────────────────────┐                  │
│   │  │  DN20-BB   │  ├─────────┤      │     DN21-DA/B        │  1 line          │
│   │  ├────────────┤  │ 3 lines │      └─────────────────────┘                  │
│   │  │  DN20-BB   │  ├─────────┤                                               │
│   │  └────────────┘  │ 4 lines │                                               │
│   ├──────────────────┼─────────┤                                               │
│   │   DN20-DA/B      │ 5 lines │      ┌─────────────────────┐                  │
│   │  ┌────────────┐  ├─────────┤      │   No high speed     │                  │
│   │  │  DN20-BB   │  │ 6 lines │      │   lines permitted   │                  │
│   │  └────────────┘  └─────────┘      └─────────────────────┘                  │
└──────────────────────────────────────────────────────────────────────────────┘
```

Configuration Guidelines	2040	2060
DN20-CA/CB	0-2	0-2
2780/3780 lines	0-6	0-6
DECnet Lines	0-1	0-1

Software for the DN20-CA/CB must be ordered separately:
2780/3780 Emulator/Terminator or DECnet-20.

Memory Expansion/Exchange Guidelines

In order to expand memory it is sometimes necessary to exchange an old memory type for a newer, higher density type memory, for example, MA exchanged for MB memory.

When an exchange is required to expand memory, all of the memory in a section must be traded in to make room for the new memory.

Memory Expansion/Exchange Procedure

When a customer wants to expand memory requiring an exchange the following procedure is to be followed:

1. Determine the amount of memory which must be traded-in (usually the amount in Section B).
2. Add to this the amount of memory expansion required.
3. Select and order the memory expansion options corresponding to this total amount of memory.
4. Show as a "trade-in allowance" on the order the appropriate dollar value for the amount of memory determined in step one. Be sure to specify the type of memory being traded-in.
5. The memory ordered in Step 3 will be shipped and invoiced along with a "Return Authorization" for the memory being traded-in.
6. When the exchanged memory is returned, a credit will be issued for the amount of the trade-in allowance on the purchase order.

Additional Equipment & Information

FIELD SERVICE

Field Service pricing shown herein reflects 12-hour/5 day DECservice coverage. This coverage includes:

- Field Service response within four (4) hours, provided the call for service is received during the contracted hours of coverage.
- Continuous remedial service until the system is fully operational again, with no extra charge to that customer should this service be performed outside the hours of coverage (providing Digital was notified during the contracted hours of coverage).
- Scheduled PM's performance outside normal working hours.

All of the services noted above are provided at no additional cost.

Only designated Field Service locations provide DECservice coverage, and the customer site must be within a 50-mile radius of the Service Office. Check with your local Branch Field Service Manager for applicability.

EXTENDED DECservice COVERAGE

To determine extended coverages, use the following multipliers:

12-hour DECservice 5 day = 1.000 × DECservice 5-day pricing
16-hour DECservice 5 day = 1.038 × DECservice 5-day pricing
24-hour DECservice 5 day = 1.115 × DECservice 5-day pricing

Saturday Coverage

12-hour DECservice: Add 0.092 × DECservice 5-day pricing
16-hour DECservice: Add 0.108 × DECservice 5-day pricing
24-hour DECservice: Add 0.131 × DECservice 5-day pricing

Sunday Coverage (same as Saturday Coverage)

12-hour DECservice: Add 0.092 × DECservice 5-day pricing
16-hour DECservice: Add 0.108 × DECservice 5-day pricing
24-hour DECservice: Add 0.131 × DECservice 5-day pricing

Examples:

To provide system coverage for 16-hour DECservice, Monday through Saturday:
  DECservice 5-day pricing × (1.038 + 0.092), or
  DECservice 5-day pricing × 1.13

To provide system coverage for 24-hour DECservice, seven days per week:
  DECservice 5-day pricing × (1.115 + .131 + .131), or
  DECservice 5-day pricing × 1.377

If, under unusual circumstances, your customer requires less than DECservice coverage, BASIC coverage may be provided, but with approval from Field Service management and your Product Line Representative. Basic coverage may be computed as follows:

BASIC coverage for 12-hour/5 day = .869 × DECservice 12-hour/5 day pricing
BASIC coverage for 8-hour/5 day = .769 × DECservice 12-hour/5 day pricing

DECsystem-10/DECSYSTEM-20 COMMUNICATIONS CABLING (DC20, DN20, and DZ11)

On an individual basis each asynchronous line may be either local EIA or EIA with full modem control. By the use of an H313-A TTY voltage/current adapter, an EIA local line may terminate a 20mA current mode terminal. This difference is transparent to the communications hardware and is determined solely by the type of cable attached to the DN25, DC20-AA, DC20-DA, or DZ11. Therefore, it is extremely critical that the correct type of line is ordered.

FULL MODEM CONTROL LINES
- For each full modem control line specified, a BC05D-25 cable must be ordered. This is a 25 foot cable.
- If a 25 foot cable is not long enough, one additional BC05D-25 cable per line may be ordered as a separate line item. Two is the maximum number of BC05D-25 cables that may be joined together.

LOCAL LINES
- For each local EIA line specified, a BC03M-A0 cable must be ordered. This is a 100 foot cable.
- Note that no H313-A is included. This means that in order to support 20mA current loop terminals, the appropriate number of H313-A's must be ordered as separate line items, one H313-A per line, at the current price.
- If the 100 foot local EIA cable is not long enough, then either longer cables must be ordered as separate items at current prices or cables may be customer built to DEC supplied specifications (available from Field Service).

20mA CURRENT MODE TERMINAL SUPPORT
- The DC20, DN25, and DZ11 hardware internally is EIA and it supports EIA lines and terminals only.
- When cable length requirements for local terminals are in excess of the published capabilities (1000 feet at up to 2400 baud and 250 feet at up to 9600 baud) then EIA short-haul modems or the use of dial-up is required. Note that the 20mA current mode is not supported for longer distance than the EIA because the transmission must be all EIA and not current mode.
- All new terminals ordered with or for systems must be EIA.
- Most terminal vendors provide a field upgrade to convert current mode terminals to EIA terminals.
- When it is necessary to attach a current mode terminal to a system--this should only be when the customer has an installed current mode terminal which is non-field convertible to EIA--then an H313-A can be ordered. Remember that this only converts EIA to/from current mode; the terminal must still be operated within the published EIA length specificiations and the H313-A must be within 25 feet(7.5m) of the terminal.
- The H313-A works at any power frequency in the 50 to 500 hertz range but works only with 120 volt power. Customers in countries which do not use 120 volt power will be required to supply their own step-down transformer from 240 volt to 120 volt. Local Field Service has the specifications for the required transformer.

TERMINAL CABLING

All terminals equipped with the 20mA current loop interface will be supplied with a cable terminated with a 4-pin telephone plug connector unless otherwise specified. Conversely, all terminals equipped with an EIA interface will be supplied with a cable that is terminated with a 25-pin dataset connector.

BC11S-25   Cable, H856 to H856, 18 twisted pair, for use with the LA180.

BC03M-xx   Null modem cable allows local connectin of asynchronous interfaces or terminals having EIA interfaces. The following lengths are available: 25 ft. (7.6m), 100 ft. (30.5m), 250 ft. (76.2m), 500 (152.4m), 1000 ft (304.8m) cable (3 shielded twisted pair) with two DB25S sockets.

BC05D-xx   EIA extension cable for use with cinch DB25S socket and DB25P plug. The following lengths are available: 10ft. (3.0m) and 25 ft. (7.6m).

CABLE SPECIFICATIONS

Line Type	Local EIA	EIA with Full Modem Control	Local 20mA Current Loop
Line Usage	Direct attachments to EIA terminals or to non-dial-up EIA modems (i.e., data only no modem control)	Direct attachments to EIA dial-up modems. The modems must have user interfaces which meet EIA RS-232-C interface type E (i.e., Bell 103-A type interface compatible).	Direct attachments to Local Current Loop terminals
Maximum Cable Length	1000 ft. if terminal speed is equal to or less than 2400 baud. 250 ft. if terminal speed is equal to or less than 9600 baud.	equal to or less than 50 ft.	max. length computer to H313-A equal to or less than 1000 ft. @ 2400 baud equal to or less than 250 ft. @ 9600 baud max. length H313-A to terminal equal to or less than 25 ft.

METERS FEET

X CABLE IS 22 AWG 4-CONDUCTOR (QUAD) INSIDE STATION WIRE DEC P.N. 9105856-04.

O CABLE IS TWO 22 AWG TWISTED PAIRS EACH SHIELDED IN BELDEN 8777 (THREE PAIR). DEC P.N. 9107723. SHIELDS TIED TO GROUND.

DISTANCE (LOG SCALE)

DATA RATE IN BAUD (LOG SCALE)

BAUD	SHIELDED (IN FEET)	UNSHIELDED (IN FEET)
110	5000	3000
300	5000	3000
1200	3000	3000
2400	1000	500
4800	1000	250
9600	250	250

All distances shown are more than 50 feet/2500pf, hence these transmissions vilolate RS-232-C.

Note that in the "EIA" interface case, shielded pair outperformed unshielded wire.

Line Type	Local EIA	EIA with Full Modem Control	Local 20mA Current Loop
Cable Type	one BC03M-xx per line	one BC05D-25 per line	one BC03M-xx plus one H313-A per line
Cable Specification for customer desired length	BC03M-25 25 ft. BC03M-A0 100 ft. BC03M-B5 250 ft. BC03M-E0 500 ft. BC03M-L0 1000 ft.	BC05D-25 25 ft. for 50 ft use two (max.) joined together	BC03M-25 25 ft. BC03M-A0 100 ft. BC03M-B5 250 ft. BC03M-E0 500 ft. BC03M-L0 1000 ft. plus one H313-A line
Notes	BC03M cables cannot be joined together for length extension purposes		Requires one desired length BC03M cable plus one H313-A per line

TX02/03/05 CABLING

The TX02, TX03 and TX05 options are supplied in 25 foot standard lengths. Longer lengths are available at additional charge, 90 days ARO.

BC10X-xx   Emergency power-off cable. Used with the TX02s and the TX05s. The following lengths are available: 25 ft. (7.6m), 50 ft. (15.2m), 75 ft., and 100 ft. (30.5m).

BC10Y-xx   IBM bus or tag. Used with the TX02s and the TX05s. The following lengths are available: 25 ft. (7.6m), 50 ft. (15.2m), 75 ft., and 100 ft. (30.5m).

BC10W-xx   Communication cable for the TX05 connector switches. The following lengths are available: 25 ft. (7.6m), 50 ft. (15.2m), 75 ft., and 100 ft. (30.5m).

STANDARD 2020 CABLES

From	To	Length
KS10	LP*	25 ft.
KS10	RM03	25 ft.
KS10	RP06	15 ft.
KS10	TAU45	15 ft.
RP06	RP06	2/25 ft.
RM03	RM03	15 ft.
TAU45	TAU45	10 ft.
KS10	LA36 CTY	25 ft.
KS10	MODEM or TERMINAL	25 ft.

*A special 100 foot line printer cable is available at additional charge.

LINE PRINTER

70-11426-A0   Optional 100-ft. Line Printer Cable.
PREREQUISITE: LP20

MISCELLANEOUS

DF10-CA *DF10-CB*	Data Channel (22-bit), 4096K address range. *PREREQUISITE:* 1090
DT03-DT	1 x 2 I/O bus switch--no cabinet or power control *PREREQUISITE:* 15¾" Mounting Space, if mounting space not available, cabinet must be ordered.
DT05-DT	1 x 2 memory bus switch--no cabinet or power control *PREREQUISITE:* 10½" Mounting Space, if mounting space not available, cabinet must be ordered.
H956	19" option cabinet for KI10 (no power control).
MC10	Memory Port MC10 port for MA10 memory MC10-E port for ME10 memory MC10-F port for MF10 memory MC10-G 2 ports for MG10 memory
MA20R-E	32K words refurbished core memory. *(Delivery subject to availability)*
MB20R-E	64K words refurbished core memory. *(Delivery subject to availability)*
TX03-A	Two channel switch for TX01. *PREREQUISITE:* TU70-C or TU72-C
TX05-A	2 x 16 tape switch. *PREREQUISITE:* TU70-C or TU72-C
TX03-B	Two channel switch for TX02.
TX05-B	2 x 16 tape switch for TX02.
TU72-CA *TU72-CB*	Magnetic tape system including DX10 external channel, controller and one TU72-E. (Blue cabinet). *PREREQUISITE:* KI10, KL10-A, or KL10-B/D. (Obsolete product, delivery subject to availability).
TU72-EA *TU72-EB*	9-track, 125 inches per second, 1600/6250 bits per inch add-on tape drive. (Blue cabinet). *PREREQUISITE:* TU72-C TU72-C. (Obsolete product, delivery subject to availability).
TU70-AC *TU70-AD*	9-track, 200 inches per second, 800/1600 bits per inch add-on tape drive. *PREREQUISITE:* TX02-E. (Obsolete product, delivery subject to availability).

COMMUNICATION UPGRADE OPTIONS
FRONT ENDS

The DN87 is a Synchronous/Asynchronous Front End Communications Subsystem. The DN87 requires the addition of DN81-XX Synchronous and/or Asynchronous Line Optoins.

DN87-BA *DN87-BB*	DN87 including DL10-A communications interface.
DN87-CA *DN87-CB*	DN87 including DL10-C port only. Requires DL10-A with available port.
DN87S-AA *DN87S-AB*	Synchronous/Asynchronous communications subsystem for KL10-B systems (includes DTE).
DN87-U	Upgrade from DC76-A or D to DN87-A or D
DN87-UM	Upgrade from DN87-A to B and DN87-D to C
DN87S-U	Upgrade from DN87-B or C to DN87S.

SYNCHRONOUS LINE OPTIONS FOR DN87

DN81-EE *DN81-EF*	Synchronous expansion cabinet which includes one DN81-H synchronous line controller for up to 10K bits per second with EIA RS-232-C modem interface.
DN81-H	Synchronous expansion line controller, for speeds up to 10K bits per second with EIA RS-232-C modem interface. Includes 25 foot cable.
DN81-J	Synchronous expansion line controller, for speeds up to 40.8K bits per second with 303-type current modem interface. Includes 25 foot cable.
DN83-A	Null Modem for use with DN81-H. Speeds: 2.0, 2.4, 4.8, 9.6, 19.2Kb.

ASYNCHRONOUS LINE OPTIONS FOR DN87

DN81-EA *DN81-EB*	Asynchronous expansion cabinet which includes one DN81-EC 16-line asynchronous expansion group. Requires two DN81-Fx 8-line terminator groups to activate the lines.
DN81-EC *DN81-ED*	Asynchronous 16-line expansion group. This requires two DN81-Fx 8-line terminator groups to activate the lines.
DN81-FA	8-line terminators with 20mA current loop local interfaces. Includes an H322 distribution panel.
DN81-FB	8-line terminators with EIA local interfaces. Includes 25 foot cables plus H312 null modems.
DN81-FC	8-line terminators with EIA full modem control interfaces. Includes 8 25 foot cables.
DN81-FD	8-line terminators with Integral Auto-Answer modems.
DN81-FF	Controller for 2 Bell 801-type Automatic Calling Units (ACU) and includes one DN81-FG.
DN81-FG	Expansion for additional Bell 801-type Automatic Calling Unit (ACU).
H312-A	Null modem for use with DN81-FC.
H322	Distribution Panel. Distributes signals from two DN81-FAs to nine 10-screw terminal strips.

DN92 OPTIONS

DN92-E   Asynchronous 4-line multiplexer, including line drivers.

DN92-CA   300 cards per minute table-top card reader and controller.
DN92-CB

DN92-PA   180 characters per second, LA180 DECprinter with 96 character set, 132 column.
DN92-PD

DN92-VA   300 lines per minute, LP05 line printer with 64 character **EDP** drum, 132 columns.
DN92-VD

DN92-WA   240 lines per minute, LP05 line printer with 96-character **EDP** drum, 132 columns.
DN92-WD

TU70 SERIES MAGNETIC TAPE DRIVE CONFIGURATION OVERVIEW

A system may consist of one or more TU72 drives, a maximum of eight drives with either a TU70 or TU71 drive, a TX02 tape control unit, and a DX20 data channel.

The tape control unit connects to each drive using radial cabling. The DX20 data channel connects directly to the internal data channel of the mainframe.

The TX03 and TX05 switches can be installed in the TX02 control unit of TOPS-10 systems only and only with a special quotation. These switches will be available as standard options on TOPS-10 with Release 7.01 and on TOPS-20 with Release 4.

The TX03 allows the user to interface between the two data channels, one control unit, and up to eight tape drives. The TX05 allows interface operations between two data channels, two control units, and up to 16 tape drives.

TOPS-20 Release 3A supports one DX20, one TX02, and up to eight tape drives (TU70, TU71, TU72). A TOPS-10 LIR under Release 6.03A currently supports the DX20/TX02 subsystem. TX03 and TX05 switches are supported configurations when there is a close operator control over one channel at a time. These configurations are not supported when both channels are enabled because the user must bear the responsibility of timesharing a single drive with its attendant problems and insure by careful assignment of device identifiers that either processor will not ask for the same device. By making the drives protected devices, a mount must be requested by a system operator before any user can avail himself of the device. The operator must ensure the specified tape is mounted before awarding a request.

The TX03 switch is a dual-ported switch which allows access to all tape drives available to the TX02.

The TX05 switch is essentially a drive switch. It enables a tape drive which is physically attached to one tape controller to be controlled by a second tape controller. This is accomplished by two communicator cables which connect the two TX02's via the TX05 option. Switch panels (which contain two rows of eight switches each and are provided with the TX05 option) enable access to individual drives to be manually enabled/disabled from either controller.

Figure 2A shows the basic configuration. Figure 2B is for dual access from one or two processors, and is generally requested when a user would like to share tape drives between two processors. Figure 2C shows tape controller redundancy from a single processor and when a user wants a high-availability tape system, one which will assure him that the system has minimum downtime from subsystem failure, this should be the requested configuration.

Figure 2D shows tape sharing and redundancy from two processors and this configuration is requested when a user with two processors wants to share tape drives and also have a high-availability tape system to assure uptime.

Figure 2E shows tape sharing and dual redundancy in high-availability environments. Users requesting this configuration are generally providing timesharing services and are trying to keep downtime to a minimum by utilizing redundancy design throughout the entire computing system.

TU70 SERIES MAGNETIC TAPE DRIVE CONFIGURATIONS
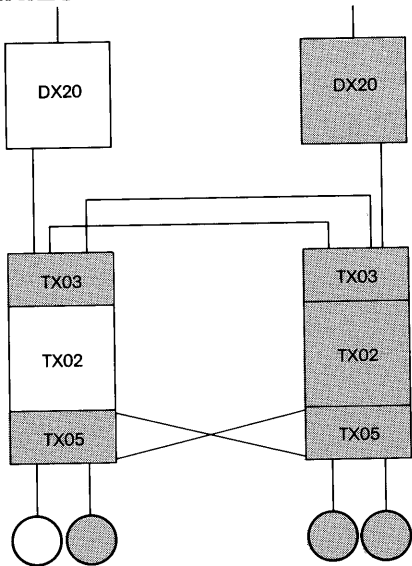
Figure 2A
TX02-E plus drive(s)
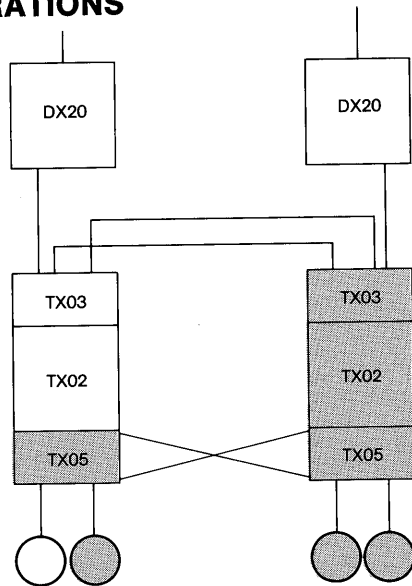
Figure 2B
(2) TX02-E plus TX05-F plus drives
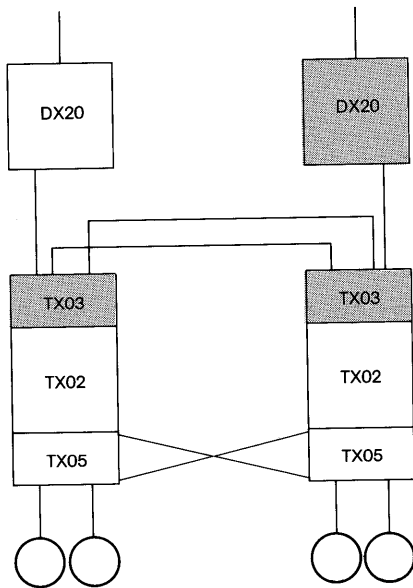
Figure 2C
TX02-E plus TX05-E plus drives
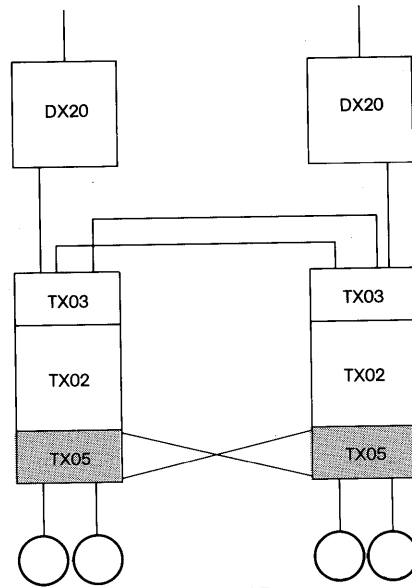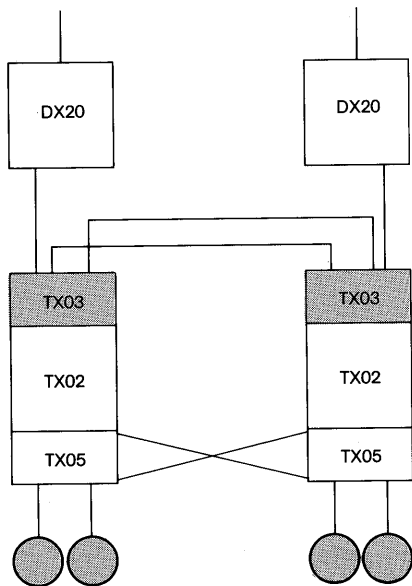

Figure 2D
TX02-E plus TX03-E plus drives

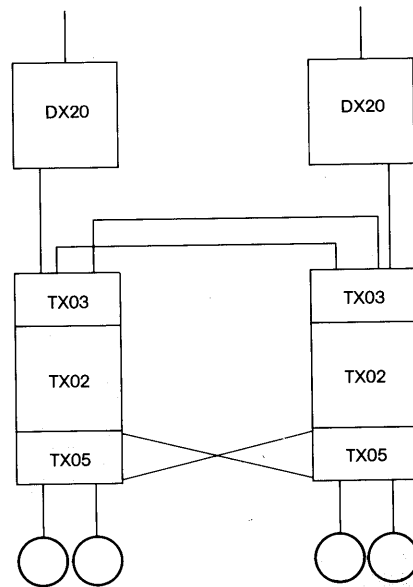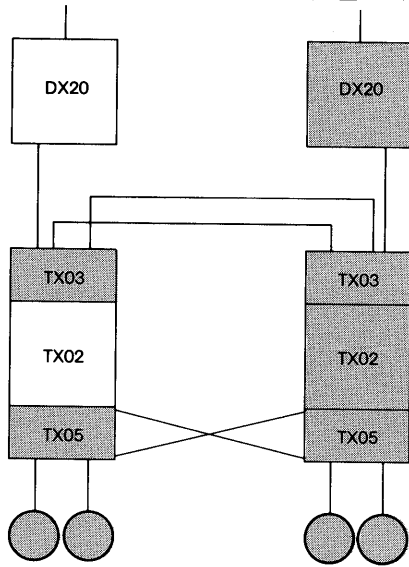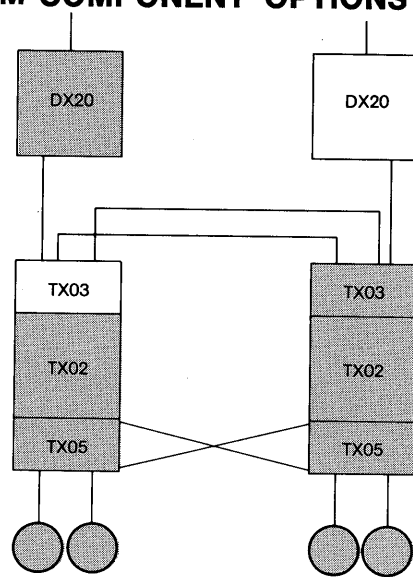Figure 2E
(2) TX02-E plus TX03-F plus drives
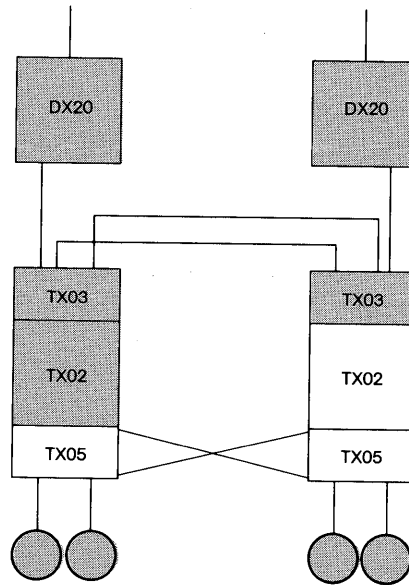

Figure 2F
(2) TX02-E plus TX03-F plus TX05 plus drives

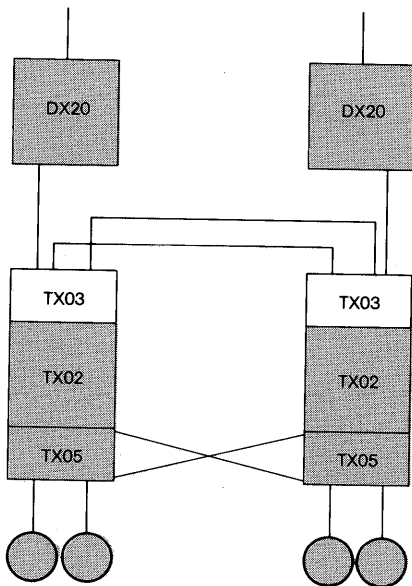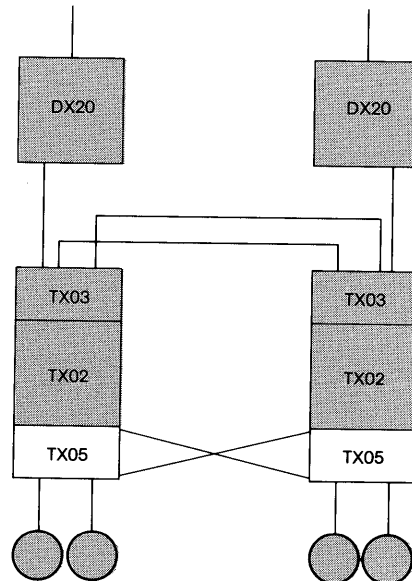# TU70 SERIES MAGNETIC TAPE DRIVE SUBSYSTEM COMPONENT OPTIONS

TX02-E

TX03-E

TX05-E

TX03-F

TX05-F

Terminals

TERMINALS

DF01-A	Acoustic Telephone Coupler with data rates up to 300 bauds, TTY and (RS-232-C) output and half- and full-duplex operations. Used with remote terminals to provide information transfer to/from a Bell 103A3 dataset or equivalent.
LA36-CE *LA36-CJ*	20mA version free-standing DECwriter II hardcopy terminal. 30 characters per second, 96 keyboard characters, 132 columns, 14 keypad.
LA36-HE *LA36-HF*	EIA version free-standing DECwriter II hardcopy terminal with 14 numeric keypad. 30 characters per second, 96 keyboard characters, 132 columns.
LAXX-LG	EIA half/full duplex option with modem control and 9 ft. cable terminated with a 25 pin data set connector.
LA37-CE *LA37-CJ*	20mA version free-standing DECwriter II hardcopy terminal, plus special character set for APL-11 software. 30 characters per second, 96 keyboard characters, 132 columns, 14 keypad.
LA37-PE *LA37-PJ*	EIA version free-standing DECwriter II hardcopy terminal, plus special character set for APL-11 software. 30 characters per second, 96 keyboard characters, 132 columns, 14 keypad.
LA38-GA	Table-top DECwriter IV printing terminal. Includes universal power supply, standard EIA interface. Variable horizontal tabs and margins, four character sizes, six line spacings and printhead adjustment. 18-button numeric keypad, 30-character per second print speed and baud rates up to 300 bits per second. Requires EIA modem or null modem cable or 20mA option.
LA38-HA	Free-standing DECwriter IV printing terminal. Includes stand, universal power supply, standard EIA interface. Variable horizontal tabs and margins, four character sizes, six line spacings and printhead adjustment. 18-button numeric keypad, 30-character per second print speed and baud rates up to 300 bits per second. Requires EIA modem or null modem cable or 20mA option.
LAX34-CL	20mA current loop option for LA38.
LA120-BA	Free-standing high speed interactive hardcopy terminal with contoured typewriter-styled keyboard with N-key rollover. EIA version, 180 characters per second, up to 9600 baud and 7x7 dot matrix. Requires EIA modem or null modem cable or 20mA option.
LA12X-AL	20mA conversion kit for LA120.

LA180-EA *LA180-ED*	Serial I/O DECprinter for use with the VT61. EIA version, 180 character per second, 132 columns, 96 character ASCII set.
LA180-PA *LA180-PD*	Parallel I/O DECprinter for use with the VT61. 180 character per second, 132 columns, 96 character ASCII set.
VT100-AA *VT100-AB*	High performance table-top video display terminal. Double-width/double-size characters, 80 columns x 24 lines or 132 columns x 14 lines, detachable keyboard, line-drawing graphic characters, smooth scrolling, split screen, reverse video or underline character attribute and composite video input/output. The VT100 operates on full-duplex asynchronous communication lines, and is supplied with a standard EIA interface. Requires EIA modem or null modem cable or 20mA option.
VT1XX-AA	20mA current loop adapter for the VT100 which allows a VT100 terminal to connect to a 20mA current loop interface. BC05F-15 cable is included.
VT62-AC *VT62-AD*	Table-top alphanumeric video display terminal for transaction processing applications. Form fill for user entry, function keys, reverse video, automatic cursor positioning, local error detection capability, left and right justification. 24 X 80-character upper/lower case display with EIA interface.
VT62-AA *VT62-AB*	Table-top alphanumeric video display terminal for transaction processing applications. Form fill for user entry, function keys, reverse video, automatic cursor positioning, local error detection capability, left and right justification. 24 X 80-character upper/lower case display with 20mA current loop interface.
VT61-AA *VT61-AB*	20mA buffered CRT Terminal 24 lines x 80 characters, 128 character ASCII. This CRT requires specific software.
VT61-AC *VT61-AD*	EIA buffered CRT Terminal 24 lines x 80 characters, 128 character ASCII. This CRT requires specific software.

Software

SOFTWARE
HOW TO ORDER SOFTWARE & SERVICES

The format of a Q-number is:
QHxxx-cm for TOPS-10 software
QTxxx-cm for TOPS-20 software

The first five characters (QHxxx or QTxxx) indicate the product code. For example, QH500 stands for FORTRAN-10 and QT001 stands for FORTRAN-20.

The code "c" indicates software products or services, support level (supported versus unsupported), as well as distribution type (binaries-only versus binaries and sources). Here are examples:

Support/Distribution	TOPS-10	Annual Svc	TOPS-20	Annual Svc
Binaries only, supported	QHxxx-Am	QHxxx-3m	QTxxx-Am	QTxxx-3m
Binaries & sources, supported	QHxxx-Xm	QHxxx-5m	QTxxx-Xm	QTxxx-5m
Binaries only, unsupported	QHxxx-Cm	—	QTxxx-Cm	—
Sources only, unsupported	QHxxx-Em	QHxxx-4m*	QTxxx-Em	QTxxx-4m*
Ntebooks & ntbk updates	—	QHxxx-Km	—	QTxxx-Km
Binaries & sources, unsupported	QHxxx-Ym	—	QTxxx-Ym	—
Additional software DISPATCH subscription	—	QHxxx-1m	—	QTxxx-1m

There are four additional product option codes used by the Federal Government:
QHxxx-Um: TOPS-10 product   QTxxx-Um: TOPS-20 product
QHxxx-ZM: Annual Service   QTxxx-Zm: Annual Service

*Unsupported updates only.

The code "m" indicates the type of media:

Media type	Value of "m"	Where used
7-track tape	F	TOPS-10 software only
9-track tape, 800 bpi	P	TOPS-10 software only
9-track tape, 1600 bpi	M	TOPS-10 or TOPS-20 software
RP04-P	K	Front end source code only
RP06-P	L	Front end source code only
Microfiche	R	Software Dispatch
Paper	Z	Software Dispatch, Notebooks & Updates

Notice that TOPS-10 software is available on three different tape formats, while TOPS-20 software is available only on 9-track tape, 1600 bpi (media type "M"). Front end source code is available only on RP04 and RP06 disk packs (codes K, L). The front end cannot access tape drives.

INITIAL SOFTWARE SERVICES

DIGITAL software is categorized into three levels of support:

CATEGORY A:	Provides installation, on-site remedial coverage when necessary during ninety (90) days following installation; SPR service, software updates, and software DISPATCHes during the first year after installation.
CATEGORY B:	Provides SPR service, software updates, and software DISPATCHes during the first year after delivery.
CATEGORY C:	Provided on an "as-is" basis with no services.

ANNUAL SERVICE

After conclusion of the initial services, customers may purchase the Annual Service. Annual Service for the operating system is a prerequisite for the purchase of services for all other system software. Annual Service for TOPS-10 or TOPS-20 consist of annual subscriptions to the following:

- Monitor code updates.
- Documentation and notebook updates.
- Personal responses to SPRs.
- Software DISPATCH.

Annual services for non-operating system software consists of the above, except for DISPATCHes. DECsystem-10 or DECSYSTEM-20 DISPATCHes include coverage for all system software.   TOPS-10 customers with systems purchased before January 1, 1979 may purchase Customer Software Maintenance Service (QHK02), which includes annual services for products indicated below.

| ALGOL-10 | COBOL-10 | GALAXY-10 |
| BASIC-10 | FORTRAN-10 | |

KA10 SUPPORT POLICY

Customers who .operate KA10-based systems and are presently supported may renew their annual service with the clear understanding of the following conditions:

1. All such contracts will be at full price regardless of expiration date.
2. Services will extend for:
    a. 6 months after the release of TOPS-10 version 7.01 for monitor support.
    b. 3 months after the release of the following software versions:

| APL V.2 | DBMS V.6 |
| FORTRAN V.6 | COBOL V.13 |

OR UNTIL JUNE 30, 1980, WHICHEVER OCCURS EARLIER

MULTI-USE LICENSES

A "multi-use" pricing policy applies to end users who have two or more systems located at the same physical site. The software may be run on the second, and additional systems for 10% of the listed license price for each additional system. A dual CPU system counts as a single system. See example.The multi-use discount applies to each separate product. For example, FORTRAN-10 and FORTRAN-20 are considered separate products:

SYSTEM	SOFTWARE F-10 $	F-20 $	DBMS-10 $	DBMS-20 $
1	x*	-	y*	-
2	.1x+	-	.1y+	-
3	-	x*	-	-
4	-	.1x+	-	y*
5	-	.1x+	-	.1y+

* = Full Price
+ = Discounted Price

SOFTWARE UNITS

The "software units" column of the following table shows the number of software units associated with each product.

SOFTWARE FOR FREE TRIAL

A customer may be given a copy of a software package for evaluation for up to 60 days, provided that the customer signs a conditional purchase order subject to a favorable evaluation within 60 days. If the customer cancels the purchase order, all copies of the evaluation software package must be destroyed.

SOURCES

There are three source policy codes used in the following tables:

1. B, S - Binaries and sources are shipped with the product.
2. B, S# - Binaries and sources are shipped with the product, even though the Software Product Description (SPD) for the product indicates that sources are not shipped. In this case, the sources are intended for use by the customer only as a product support tool.
3. B - No sources are shipped with the product. In this case, the customer may purchase the sources from DIGITAL.

The appropriate source policy is indicated by product in the source policy column of the following table.

MISCELLANEOUS CHARGES AND EXPENSES

TRAVEL EXPENSES--When commercial and/or overnight travel is required, the customer will be charged actual expenses.
SHIFT DIFFERENTIAL--Services performed at times other than during DIGITAL's normal working hours will be charged at basic hourly rates plus the percentage indicated below:

Monday through Friday, 5 pm to Midnight	10%
All other times	20%

Prices effective in the United States and Canada only.

SOFTWARE PACKAGES

TOPS-10	TOPS-20	Description	SW Units	Source Policy TOPS-10	TOPS-20
1090 Symmetrical Multi-Processing (SMP)					
QH302-Am		TOPS-10 SMP support for 1090 only (Prerequisite is M9301-W bootstrap - See Section 1090)		B,S	
Communication Software (Supported)					
QH061-Xm		2780/3780 Software for DECsystem-10	1	B,S	
QH681-Xm		DECnet-10 Task-to-Task	1	B,S	
	QT042-XM	2780/3780 Software (2040, 2050, 2060)	1		B,S
	QTD01-AM	DECnet-20 (2040, 2060)	1		B
	QTD20-AM	DECnet-20 (2020)	1		B

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TOPS-10	TOPS-20	Description	SW Units	Source Policy TOPS-10	TOPS-20

LANGUAGE AND DATA MANAGEMENT (Supported)

TOPS-10	TOPS-20	Description	SW Units	TOPS-10	TOPS-20
QH500-Xm	QT001-AM	FORTRAN (ANS-66 compiler)	1	B,S	B,S#
QH502-Xm	QT002-AM	ALGOL (ALGOL-60 compiler)	1	B,S	B,S#
QH503-Xm		BASIC-10	1	B,S	
	QT027-AM	BASIC-Plus-2	1		B
QH300-Xm	QT007-AM	SORT-MERGE	1	B,S	B,S#
QH508-Xm	QT011-AM	COBOL-68 with SORT/MERGE	1	B,S	B,S#
QH099-Xm	QT099-AM	COBOL-74 (ANS-74) compiler plus COBOL-68 with SORT/MERGE; requires approval of District Software Manager and Software Product Manager.)	1	B,S	B,S#
QH101-Xm	QT008-AM	DBMS (Includes 2 training credits)	3	B	B
QH045-Xm	QT016-AM	IQL, Interactive Query Language (Extended version, with DBMS interface, and both ISAM and sequential	2	B	B
QH020-Xm		MCS-10 Message Control System		B,S	
	QT037-AM	TRAFFIC-20	1		B
QH072-Xm	QT014-AM	APL (Basic Version) (Same as APLSF, but with no file input-output)	1	B	B

TOPS-10	TOPS-20	Description	SW Units	Source Policy TOPS-10	TOPS-20
LANGUAGE AND DATA MANAGEMENT (Supported)					
QH071-Xm	QT012-AM	APLSF (APL with system functions)	2	B	B
QH060-Xm	QT009-AM	CPL Conversational Program Language (ANS-76 PL/I subset interpreter)	1	B	B
LICENSE UPGRADES					
QH074-Am	QT025-AM	APL (Basic) to APLSF		B	B
QH076-Am		APL-E and APL-F to APL-SF		B	
	QT028-AM	BASIC to BASIC-Plus-2			B
QH509-AM	QT024-AM	SORT/MERGE to COBOL-68 with SORT/MERGE			B
QH511-Am	QT044-AM	COBOL-68 with SORT/MERGE to COBOL-74 with SORT/MERGE		B	B
SUPPORT SERVICES					
QHK01-Km		One Year Software Service		N/A	N/A
QHK20-KZ	QT018-KZ	Software Notebook Set (Includes one year of update service.)		N/A	N/A
QHK14-3Z	QT018-3Z	Software Notebook Update Service		N/A	N/A
QHK12-1Z	QT021-1Z	Additional Software DISPATCH subscription (paper)		N/A	N/A
QHK12-KZ		Additional Software DISPATCH subscription (fiche)		N/A	N/A
	QTK02-KM	Set of current released software		N/A	N/A

TOPS-10	TOPS-20	Description	SW Units	Source Policy TOPS-10	TOPS-20
MISCELLANEOUS UNSUPPORTED SOFTWARE					
QH301-Ym		TOPS-10 CUSPS		B, S	
QH090-Ym		SITGO for KL CPU		B, S	
QH093-Ym		SITGO for KA or KI CPU (Load-and-go FORTRAN compiler written by Stevens Institute of Technology)		B, S	
QH091-CD(CF)		SITBOL SNO-BOL Compiler (Written by Stevens Institute of Technology)		B, S	
QHCAP-BD		CAAP-10 (College Administration Application Package, Sources and documentation only)		S	
	QT004-CM	BASIC-20			B, S

SOURCES (UNSUPPORTED)

All source packages require the corresponding binary package.

TOPS-10	TOPS-20	Description	SW Units	Source Policy TOPS-10	TOPS-20
	QT030-EM	TOPS-20 monitor Sources			S
	QT038-EM	TOPS-20 Exec Sources			S
	QT029-Em	TOPS-20 Front End Sources			S
	QT040-Em	TOPS-20 Source Package (Includes QT030, QT029, QT038)			S

TOPS-10	TOPS-20	Description	SW Units	Source Policy TOPS-10	TOPS-20
SOURCES (UNSUPPORTED)					
QT666-Em		TOPS-10 Front End Sources		S	
	QT045-Am	RPG-FORTRAN-20 V1 Sources			S
QH101-Em	QT008-EM	DBMS Sources		S	S
QT071-Em	QT012-EM	APLSF Sources		S	S
QT060-Em	QT009-EM	CPL Sources		S	S
	QT027-EM	BASIC-Plus-2 Sources			S
MICROCODE AND DIAGNOSTICS (UNSUPPORTED)					
QH850-NM(NP)		1090 Micro-code Source Code		B, S	
ZH009-Cm		KL10-A/B Maintenance Product		B	
ZH006-Cm	ZH006-CM	KL10C Mainte-nance Product			B
	ZH007-CM	KL10D Mainte-nance Product			
ZH008-Cm	ZH008-CM	KL10E Mainte-nance Product		B	B
	ZH010-CM	10/20 Mainte-nance Product ZH006 to ZH009 Upgrade			
QT046-Ym	QT046-YM	KS10 Micro-code Product		B	B
ZT001-Ym	ZT001-YM	2020 Diagnos-tics		B	B

SYSTEMS & OPTIONS INDEX

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LARGE SYSTEMS PRODUCT SUMMARY
PRICE INSERT
JULY 1979

PRICE

All prices listed are F.O.B. DIGITAL's plant in Massachusetts and apply in the continental United States only. Prices do not include shipping or transit insurance.

DISCOUNTS

S = Discountable under Large Systems Group Discount Agreement
N = Not discountable

MULTI-USE LICENSE

A "multi-use" pricing policy applies to end users who have two or more systems located at the same physical site. The software may be run on the second, and additional systems for 10% of the listed license price for each additional system. A dual CPU system counts as a single system. See example. The multi-use discount applies to each separate product. For example, FORTRAN-10 and FORTRAN-20 are considered separate products:

SYSTEM	SOFTWARE F-10 $	F-20 $	DBMS-10 $	DBMS-20 $
1	x*	-	y*	-
2	.1x+	-	.1y+	-
3	-	x*	-	-
4	-	.1x+	-	y*
5	-	.1x+	-	.1y+

* = Full Price
+ = Discounted Price

DECSERVICE MAINTENANCE

This column lists the Field Service 12 hour/5 day monthly maintenance charge for a Basic Service Agreement. Please refer to page 88 for additional information on Field Service Charges.

FIELD SERVICE INSTALLATION

Field Service installation costs are included in the Initial Support Package bundled with the Basic System Packages.
Installation costs are not included in system add-on hardware prices listed in the Price Insert. Please add them to your order.

PAGE

Refers to the corresponding page in this Produce Summary.

NOTE:

(*) contact DIGITAL for prices.

Option No.	Price	EU Disc Type	DSMC	Add-on Instl	Page
1091-SA(SB)	440,700	S	2,378	N/A	17
1090-PA(PB)	581,600	S	2,381	N/A	5
1090-VA(VB)	456,450	S	N/A	N/A	9
1090S-UA(UB)	400,000	S	932	2,125	5
1090S-UC(UD)	400,000	S	932	3,325	5
1091-PA(PB)	476,700	S	2,377	N/A	17
1091-SA(SB)	440,700	S	2,378	N/A	17
2020-GE(GF)	198,000	S	1,385	N/A	29
2020-GH(GJ)	198,000	S	1,385	N/A	29
2020-GK(GL)	228,000	S	1,450	N/A	29
2020-GM(GN)	228,000	S	1,450	N/A	29
2020-PA(PB)	129,800	S	859	N/A	29
2020-PC(PD)	129,800	S	859	N/A	29
2020-SA(SB)	144,800	S	859	N/A	29
2020-SC(SD)	144,800	S	859	N/A	29
2040-SA(SB)	324,600	S	2,173	N/A	39
2060-PA(PB)	399,100	S	2,626	N/A	53
2060-UA	100,000	S	N/A	1,380	44,57
2060-UB	100,000	S	N/A	2,070	44,57
2060-UC	10,000	S	N/A	460	44,57
2060-UD	10,000	S	N/A	460	44,57

Option No.	Price	EU Disc Type	DSMC	Add-on Instl	Page
70-11426-A0	1,500	N	N/A	N/A	67
BC05D-xx					66
BC10W-25	750	S	N/A	N/A	68
BC10W-50	1,070	S	N/A	N/A	68
BC10W-75	1,400	S	N/A	N/A	68
BC10W-AO	1,720	S	N/A	N/A	68
BC10X-25	157	S	N/A	N/A	68
BC10X-50	178	S	N/A	N/A	68
BC10X-75	195	S	N/A	N/A	68
BC10X-AO	213	S	N/A	N/A	68
BC10Y-25	345	S	N/A	N/A	68
BC10Y-50	440	S	N/A	N/A	68
BC10Y-75	540	S	N/A	N/A	68
BC10Y-AO	637	S	N/A	N/A	68
BC11S-25	115	A	N/A	N/A	66
BC03M-25	60	Y	N/C	N/A	66
BC03M-A0	120	Y	N/C	N/A	66
BC03M-B5	180	Y	N/C	N/A	66
BC03M-E0	300	Y	N/C	N/A	66
BC03M-L0	600	Y	N/C	N/A	66
CD20-AA(AB)	6,170	S	115	322	20,31 42,56
CD20-CA(CB)	21,800	S	198	391	20,31 42,56
CP10-DA(DB)	29,700	N	301	621	8
CP20-BL(BM)	34,500	N	301	621	20
CP20-CL(CM)	34,500	N	301	621	42,56
CR10-FA(FB)	9,680	S	113	690	8
CR10-HA(HB)	24,500	S	187	748	8
DC20-AA	5,280	S	91	541	20 42,56
DC20-CC	2,200	N	N/C	N/C	42,56
DC20-CD	2,200	S	N/C	N/C	20
DC20-DA	1,580	S	78	201	20 42,56
DC20-EA(EB)	11,000	S	202	374	20
DC20-EC(ED)	11,000	S	156	374	42,56
DF01-A	760	N	14	132	77
DF10-CA			77	552	69
DIB20	5,500	N	49	362	20 42,56
DN20-BA	3,580	S	35	190	8,21 31,43,56
DN20-BB	1,380	S	14	173	8,21 31,43,56
DN20-CA(CB)	28,200	S	189	431	42,56
DN20-CC(CD)	28,200	S	189	431	8,21
DN20-DA(DB)	9,980	S	35	247	8,21 31,43,56
DN20-MA(MB)	32,000	S	189	375	42,56
DN20-MU	8,400	S	N/A	425	42,56
DN200-AA(AB)	21,300	S	120	N/A	9,21
DN21-BA	3,050	S	35	190	8,21 43,56
DN21-DA(DB)	9,980	S	35	247	8,21 43,56
DN22-AA(AB)	12,500	S	151	475	31
DN25-AA	4,510	S	45	190	8,21
DN25-AB	2,310	S	31	138	8,21
DN25-BA	1,710	S	31	138	8,21
DN25-DA(DB)	10,980	S	50	247	8,21
DN25-EC(ED)	13,800	S	74	431	8,21
DN81-EA(EB)	10,340	S	72	360	70
DN81-EC(ED)	6,820	S	66	259	70
DN81-EE(EF)	10,340	S	37	250	70
DN81-FA	950	S	20	178	70
DN81-FB	2,220	S	20	201	70
DN81-FC	2,240	S	32	247	70

Option No.	Price	EU Disc Type	DSMC	Add-on Instl	Page
DN81-FD	5,600	S	110	667	70
DN81-FF	1,380	N	19	380	70
DN81-FG	860	N	13	253	70
DN81-H	3,570	S	31	250	70
DN81-J	5,450	S	32	261	70
DN83-A	500	S	2	115	70
DN87-BA(BB)	58,000	S	323	1,438	70
DN87-CA(CB)	30,500	S	240	834	70
DN87-U	10,500	S	N/C	288	70
DN87-UM	6,200	S	N/C	247	70
DN87S-AA(AB)	33,000	S	269	863	70
DN87S-U	5,800	S	N/C	288	70
DN92-CA(CB)	6,170	N	79	362	71
DN92-E	1,500	S	23	224	71
DN92-PA(PD)	3,240	S	65	144	71
DN92-VA(VD)	11,800	S	165	339	71
DN92-WA(WD)	14,050	S	165	339	71
DNCXX-AA(AB)	6,170	S	115	322	9,21
DNHXX-AA(AB)	7,500	S	N/C	N/A	31
DNLXX-BA(BB)	11,800	S	165	299	9,21
DNLXX-CA(CB)	14,050	S	165	299	9,21
DNSXX-AA	2,370	S	24	201	9,21
DT03-DT	9,980	N	52	339	69
DT05-DT	10,500	N	58	339	69
DZ11-AA	2,310	S	32	224	31
DZ11-BA	1,800	S	27	178	31
H312-A	140	A	2	115	70
H322	185	Y	N/C	115	70
H956	1,575	N	N/C	N/C	69
KL10-DA(DB)	395,000	S	928	2,300	5
KL10-PM	42,000	S	N/C	690	9
KL10-PV	50,000	S	N/C	1,380	9
LA120-BA	2,600	Y	32	144	77
LA12X-AL	120	Y	N/A	127	77
LA180-EA(ED)	3,770	Y	71	144	78
LA180-PA(PD)	3,240	Y	65	144	78
LA36-CE(CJ)	2,100	Y	24	144	77
LA36-HE(HJ)	2,200	Y	24	144	77
LA37-CE(CJ)	2,950	Y	28	161	77
LA37-PE(PJ)	3,050	Y	28	161	77
LA38-GA	1,600	Y	20	144	77
LA38-HA	1,700	Y	20	161	77
LAX34-CL	120	Y	3	127	77
LAXX-LG	110	N	N/C	127	77
LP07-YA	4,000	N	N/A	N/A	7,20 41,55
LP07-YB	4,000	N	N/A	N/A	7,20 41,55
LP07-YC	4,000	N	N/A	N/A	7,20 41,55
LP07-YD	4,000	N	N/A	N/A	7,20 41,55
LP07-YF	4,000	N	N/A	N/A	7,20 41,55
LP07-YH	4,000	N	N/C	144	7,20 41,55
LP07-YJ	4,000	N	N/C	144	7,20 42,55
LP07-YK	4,000	N	N/A	N/A	7,20 42,55
LP07-YL	4,000	N	N/A	N/A	7,20 42,55
LP07-YM	4,000	N	N/A	N/A	7,20 42,55
LP100-BA(BB)	59,000	S	499	473	7
LP100-DA(DB)	24,150	N	390	643	7
LP100-DC(DD)	24,150	N	390	643	7
LP100-EA(EB)	26,250	N	390	643	7

Option No.	Price	EU Disc Type	DSMC	Add-on Instl	Page
LP100-EC(ED)	26,250	N	390	643	7
LP100-FA(FB)	41,425	N	341	643	7
LP100-FC(FD)	41,425	N	341	643	7
LP100-HA(HB)	42,475	N	341	643	7
LP100-HC(HD)	42,475	N	341	643	7
LP20-AA(AB)	16,500	N	279	391	19,30 41,55
LP20-AC(AD)	16,500	N	279	391	19,30 41,55
LP20-BA(BB)	17,500	N	279	391	19,30 41,55
LP20-BC(BD)	17,500	N	279	391	19,30 41,55
LP20-CA(CB)	34,125	S	321	651	19,30 41,55
LP20-CC(CD)	34,125	N	321	651	19,30 41,55
LP20-DA(DB)	35,385	S	321	651	19,30 41,55
LP20-DC(DD)	35,385	N	321	651	19,30 41,55
LP200-BA(BB)	51,000	S	499	473	19,41,55
M9301-WA	2,000	S	3	155	5
M9301-WB	2,000	S	3	155	5
MA20R-E					69
MB20-E	27,000	S	130	352	17
MB20-GC(GD)	27,000	S	169	352	17
MB20R-E	*	*	*	*	69
MC10	-	-	7	259	69
MC10-E	-	-	7	259	69
MC10-F	1,100	S	9	259	69
MC10-G	2,200	S	18	374	69
MF20-E	65,000	S	221	541	17,39,53
MF20-LA(LB)	65,000	S	559	2,875	17,39,53
MF20-LC(LD)	65,000	S	364	2,070	17,39,53
MF20-LH(LJ)	65,000	S	581	2,500	39,53
MF20-LM(LN)	65,000	S	581	2,500	17
MF20-LK(LL)	65,000	S	285	1,800	17,39,53
MH10-E (Set of 2)	60,000	S	130	N/A	5
MH10-HA(HB)	60,000	S	574	1,400	5
MH10-LA(LB)	100,000	S	834	1,400	5
MS10-BA	8,000	S	65	265	30
PC10-CL(CM)	15,560	N	140	357	8
PC20-BL(BM)	14,500	N	140	357	20
PC20-CL(CM)	14,500	N	140	357	42,56
RH20	10,500	S	32	224	5,18 40,54
RM03-AA(AD)	19,000	Y	182	569	30
RP06-AA(AB)	34,000	Y	247	753	6,18 30,40,54
RP06-BA(BB)	39,140	Y	273	1,035	6,18 40,54
RP06-C	5,150	Y	26	1,035	6,18 40,54
TAU45-EC(ED)	29,500	N	273	742	30
TAU77-EC(ED)	28,000	Y	338	745	30
TU45A-EC(ED)	26,400	N	305	431	40,54
TU45A-EH(EJ)	14,700	N	227	362	30,40,54
TU45C-EC(ED)	26,400	N	305	431	6,18
TU45C-EH(EJ)	14,700	N	227	362	6,18
TU70-AC			147	339	69
TU72-CA(CB)	110,000	N	689	1,202	69
TU72-EA(EB)	33,000	N	195	345	69
TU72-EC(ED)	33,000	N	195	345	6,19 40,54
TU77-AF(AJ)	19,500	Y	227	400	6,30 19,40,54
TU77-CB(CD)	28,000	Y	305	460	6,18 40,54

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Option No.	Price	EU Disc Type	DSMC	Add-on Instl	Page
TX02-EC(ED)	90,500	N	588	891	6
TX02-EE(EF)	90,500	N	588	891	40,54
TX02-EH(EJ)	90,500	N	588	891	19
TX03-A	6,000	S	13	472	69
TX03-B	6,000	S	13	472	69
TX03-EC(ED)	51,000	N	244	1,443	6
TX03-EE(EF)	51,000	N	244	1,443	41,54
TX03-EH(EJ)	51,000	N	244	1,443	19
TX03-FB	12,000	N	26	1,794	6,19 41,54
TX05-A	6,000	S	13	472	69
TX05-B	12,000	S	13	472	69
TX05-EC(ED)	69,500	N	370	1,317	6,19 41,54
TX05-FB	24,000	N	26	2,001	6,19 41,54
VT100-AA(AB)	1,900	Y	22	144	78
VT1XX-AA	120	Y	3	127	78
VT61-AA(AB)	4,030	Y	42	167	78
VT61-AC			33	167	78
VT62-AA(AB)	3,150	N	65	182	78
VT62-AC(AD)	3,150	N	65	182	78

Option Number	License Fee($)	Page	Option Number	License Fee($)	Page
QH020-5F	5,500	84	QH061-5P	1,500	83
QH020-5M	5,500	84	QH061-UF	8,500	83
QH020-5P	5,500	84	QH061-UM	8,500	83
QH020-UF	56,000	84	QH061-UP	8,500	83
QH020-UM	56,000	84	QH061-XF	7,500	83
QH020-UP	56,000	84	QH061-XM	7,500	83
QH020-XF	55,000	84	QH061-XP	7,500	83
QH020-XM	55,000	84	QH071-3M	1,500	85
QH020-XP	55,000	84	QH071-3P	1,500	85
QH020-ZF	6,300	84	QH071-5F	1,500	85
QH020-ZM	6,300	84	QH071-5M	1,500	85
QH020-ZP	6,300	84	QH071-5P	1,500	85
QH045-5F	1,200	84	QH071-AF	20,000	85
QH045-5M	1,200	84	QH071-AM	20,000	85
QH045-5P	1,200	84	QH071-AP	20,000	85
QH045-AF	17,000	84	QH071-UF	21,000	85
QH045-AM	17,000	84	QH071-UM	21,000	85
QH045-AP	17,000	84	QH071-UP	21,000	85
QH045-EF	17,000	84	QH071-ZF	2,300	85
QH045-EM	17,000	84	QH071-ZM	2,300	85
QH045-EP	17,000	84	QH071-ZP	2,300	85
QH045-UF	18,000	84	QH072-5F	900	84
QH045-UM	18,000	84	QH072-5M	900	84
QH045-UP	18,000	84	QH072-5P	900	84
QH060-3F	650	85	QH072-AF	10,000	84
QH060-3M	650	85	QH072-AM	10,000	84
QH060-3P	650	85	QH072-AP	10,000	84
QH060-5F	650	85	QH072-UF	11,000	84
QH060-5M	650	85	QH072-UM	11,000	84
QH060-5P	650	85	QH072-UP	11,000	84
QH060-AF	6,000	85	QH072-ZF	1,700	84
QH060-AM	6,000	85	QH072-ZM	1,700	84
QH060-AP	6,000	85	QH072-ZP	1,700	84
QH060-UF	7,000	85	QH074-AF	15,000	85
QH060-UM	7,000	85	QH074-AM	15,000	85
QH060-UP	7,000	85	QH074-AP	15,000	85
QH061-3F	1,500	83	QH076-AF	3,000	85
QH061-3M	1,500	83	QH076-AM	3,000	85
QH061-3P	1,500	83	QH076-AP	3,000	85
QH061-5F	1,500	83	QH090-UF	3,640	86
QH061-5M	1,500	83	QH090-UM	3,640	86

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Option Number	License Fee($)	Page	Option Number	License Fee($)	Page
QH090-UP	3,640	86	QH503-5P	900	84
QH090-YF	2,640	86	QH503-UF	7,000	84
QH090-YM	2,640	86	QH503-UM	7,000	84
QH090-YP	2,640	86	QH503-UP	7,000	84
QH091-CD	2,640	86	QH503-XF	6,000	84
QH091-CF	2,640	86	QH503-XM	6,000	84
QH093-UF	3,640	86	QH503-XP	6,000	84
QH093-UM	3,640	86	QH508-5F	1,300	84
QH093-UP	3,640	86	QH508-5M	1,300	84
QH093-YF	2,640	86	QH508-5P	1,300	84
QH093-YM	2,640	86	QH508-UF	14,000	84
QH093-YP	2,640	86	QH508-UP	14,000	84
QH099-UF	14,000	84	QH508-XF	13,000	84
QH099-UM	14,000	84	QH508-XM	13,000	84
QH099-UP	14,000	84	QH508-XP	13,000	84
QH099-XF	13,000	84	QH508-ZF	1,800	84
QH099-XM	13,000	84	QH508-ZM	1,800	84
QH099-XP	13,000	84	QH508-ZP	1,800	84
QH101-5F	2,750	84	QH509-UF	11,000	85
QH101-5M	2,750	84	QH509-UM	11,000	85
QH101-5P	2,750	84	QH509-UP	11,000	85
QH101-AF	30,000	84	QH509-XF	10,000	85
QH101-AM	30,000	84	QH509-XM	10,000	85
QH101-AP	30,000	84	QH509-XP	10,000	85
QH101-EM	*	87	QH511-UF	*	85
QH101-UF	31,000	84	QH511-UM	*	85
QH101-UM	31,000	84	QH511-UP	*	85
QH101-UP	31,000	84	QH511-XF	*	85
QH101-ZF	3,550	84	QH511-XM	*	85
QH101-ZM	3,550	84	QH511-XP	*	85
QH101-ZP	3,550	84	QH666-EK	20,000	87
QH300-5F	350	84	QH666-EL	20,000	87
QH300-5M	350	84	QH681-3F	2,500	83
QH300-5P	350	84	QH681-5F	2,500	83
QH300-UF	4,000	84	QH681-5M	2,500	83
QH300-UM	4,000	84	QH681-5P	2,500	83
QH300-UP	4,000	84	QH681-UF	16,000	83
QH300-XF	3,000	84	QH681-UM	16,000	83
QH300-XM	3,000	84	QH681-UP	16,000	83
QH300-XP	3,000	84	QH681-XF	15,000	83
QH300-ZF	850	84	QH681-XM	15,000	83
QH300-ZM	850	84	QH681-XP	15,000	83
QH300-ZP	850	84	QH850-NM	500	87
QH301-YM	*	86	QH850-NP	500	87
QH302-AF	5,000	5,83	QH850-YD	44,000	87
QH302-AM	5,000	5,83	QH850-YM	44,000	87
QH302-AP	5,000	5,83	QH850-YP	44,000	87
QH500-5F	950	84	QHCAP-BD	1,100	86
QH500-5M	950	84	QHCAP-UD	2,100	86
QH500-5P	950	84	QHK01-KF	1,820	85
QH500-UF	11,000	84	QHK01-KM	1,820	85
QH500-UM	11,000	84	QHK01-KP	1,820	85
QH500-UP	11,000	84	QHK01-ZF	6,820	85
QH500-XF	10,000	84	QHK01-ZM	6,820	85
QH500-XM	10,000	84	QHK01-ZP	6,820	85
QH500-XP	10,000	84	QHK12-1R	440	85
QH502-5F	750	84	QHK12-1Z	440	85
QH502-5M	750	84	QHK12-KZ	440	85
QH502-5P	750	84	QHK12-ZZ	740	85
QH502-UF	11,000	84	QHK14-3Z	550	85
QH502-UM	11,000	84	QHK14-KZ	220	85
QH502-UP	11,000	84	QHK14-ZZ	520	85
QH502-XF	10,000	84	QHK20-KZ	550	85
QH502-XM	10,000	84	QHK20-ZZ	1,275	85
QH502-XP	10,000	84	QT001-3M	950	84
QH503-5F	900	84	QT001-AM	10,000	84
QH503-5M	900	84	QT001-UM	11,000	84

Option Number	License Fee($)	Page	Option Number	License Fee($)	Page
QT001-ZM	1,750	84	QT029-4K	2,500	86
QT002-3M	750	84	QT029-4L	2,500	86
QT002-AM	10,000	84	QT029-EK	20,000	86
QT002-UM	11,000	84	QT029-EL	20,000	86
QT002-ZM	1,550	84	QT030-4M	3,000	86
QT004-CM	6,000	86	QT030-EM	25,000	86
QT004-UM	7,000	86	QT030-UM	26,000	86
QT007-3M	350	84	QT037-3M	1,000	84
QT007-AM	3,000	84	QT037-AM	6,000	84
QT007-UM	4,000	84	QT037-UM	7,000	84
QT007-ZM	1,150	84	QT037-ZM	1,500	84
QT008-3M	2,750	84	QT038-4M	1,000	86
QT008-AM	30,000	84	QT038-EM	7,000	86
QT008-EM	*	87	QT038-UM	8,000	86
QT008-UM	31,000	84	QT038-ZM	1,500	86
QT008-ZM	3,250	84	QT040-4K	4,000	86
QT009-3M	650	85	QT040-4L	4,000	86
QT009-AM	6,000	85	QT040-EK	40,000	86
QT009-EM	*	87	QT040-EL	40,000	86
QT009-UM	7,000	85	QT042-3M	1,500	83
QT009-ZM	1,450	85	QT042-UM	8,500	83
QT011-3M	1,300	84	QT042-XM	7,500	83
QT011-AM	13,000	84	QT042-ZM	2,000	83
QT011-UM	14,000	84	QT044-AM	*	85
QT011-ZM	2,100	84	QT044-UM	*	85
QT012-3M	1,500	85	QT045-AM	8,000	87
QT012-AM	20,000	85	QT046-NM	500	87
QT012-EM	*	87	QT046-YM	44,000	87
QT012-UM	21,000	85	QT060-EM	*	87
QT012-ZM	2,300	85	QT071-EM	*	87
QT014-3M	900	84	QT099-3M	1,300	84
QT014-AM	10,000	84	QT099-AM	13,000	84
QT014-UM	11,000	84	QT099-UM	14,000	84
QT014-ZM	1,700	84	QT099-ZM	1,800	84
QT016-3M	1,200	84	QTD01-3M	1,000	83
QT016-AM	17,000	84	QTD01-AM	5,000	83
QT016-EM	17,000	84	QTD01-UM	6,000	83
QT016-UM	18,000	84	QTD01-ZM	1,500	83
QT016-ZM	1,700	84	QTD20-3M	1,000	83
QT018-3Z	550	85	QTD20-AM	5,000	83
QT018-KZ	975	85	QTD20-UM	6,000	83
QT021-1Z	440	85	QTD20-ZM	1,500	83
QT021-KZ	940	85	QTK02-KM	5,500	85
QT021-ZZ	1,140	85	ZH006-CM	44,000	87
QT024-AM	10,000	85	ZH006-CP	44,000	87
QT024-UM	11,000	85	ZH007-CM	44,000	87
QT025-AM	15,000	85	ZH007-CP	44,000	87
QT025-UM	16,000	85	ZH008-CM	44,000	87
QT027-3M	1,100	87	ZH008-CP	44,000	87
QT027-AM	10,000	87	ZH009-CM	44,000	87
QT027-EM	*	87	ZH009-CP	44,000	87
QT027-UM	11,000	87	ZH010-CM	500	87
QT027-ZM	1,900	87	ZH010-CP	500	87
QT028-AM	4,500	85	ZT001-NM	100	87
QT028-UM	5,500	85	ZT001-YM	22,000	87

QUANTITY DISCOUNTS

MB20-xx

Quantity	Total
1	27,000
2	54,000
3	63,000
4	72,000

MS10-BA

Quantity	Unit	Total
1	8,000	8,000
2	7,500	15,000
3	7,167	21,501
4	6,875	27,500

MF20-xx

Quantity	Unit	Total
1	65,000	65,000
2	56,875	113,750
3	54,167	162,501
4	48,750	195,000
5	44,000	220,000
6 or more	40,000	--

TRADE-IN ALLOWANCES

CPU Package Allowances

KA10 to 1090-V Package	50,000
KI10 to 1090-V Package	100,000

Peripheral Allowances

DF10-A	5,000
DF10-C	6,000
DL10	5,800
RH10	10,000

These allowances may be applied only towards purchase of like DECsystem-10 based equipment on a one for one basis.

DECSYSTEM-2020 Trade-In Allowances

2020 CPU, First 256K Memory, Communications Lines, Magtape Interface, Disks Interface, and Console	55,000
Exchange RM03 for RP06	9,000
64K Add-on Memory	8,000
128K Add-on Memory	15,000
256K Add-on Memory	27,500

QUANTITY DISCOUNTS

DC20-xx Communications Hardware Prices for 1091

No. of Asynch. Lines	Purchase Price	5-Day DECservice Maintenance Price per Month 12 Hour
16*	N/C	N/C
24	5,280	92
32	6,860	170
40	20,060	373
48	21,640	451
56	26,920	543
64	28,500	621
72	33,780	713
80	35,360	791
88	40,640	883
96	4,220	961
104	53,220	1,164
112	54,800	1,242
120	60,080	1,334
128	61,660	1,412

*Included in 1091 basic package.

DC20-xx Communications Hardware Prices for 2040 and 2060

No. of Asynch. Lines	Purchase Price	5-Day DECservice Maintenance Price per Month 12 Hour
16*	N/C	N/C
24	5,280	92
32	6,860	170
40	20,060	326
48	21,640	404
56	26,920	496
64	28,500	574
72	33,780	666
80	35,360	744
88	40,640	836
96	4,220	914
104	53,220	1,070
112	54,800	1,148
120	60,080	1,240
128	61,660	1,318

*Included in 2040 or 2060 basic package.