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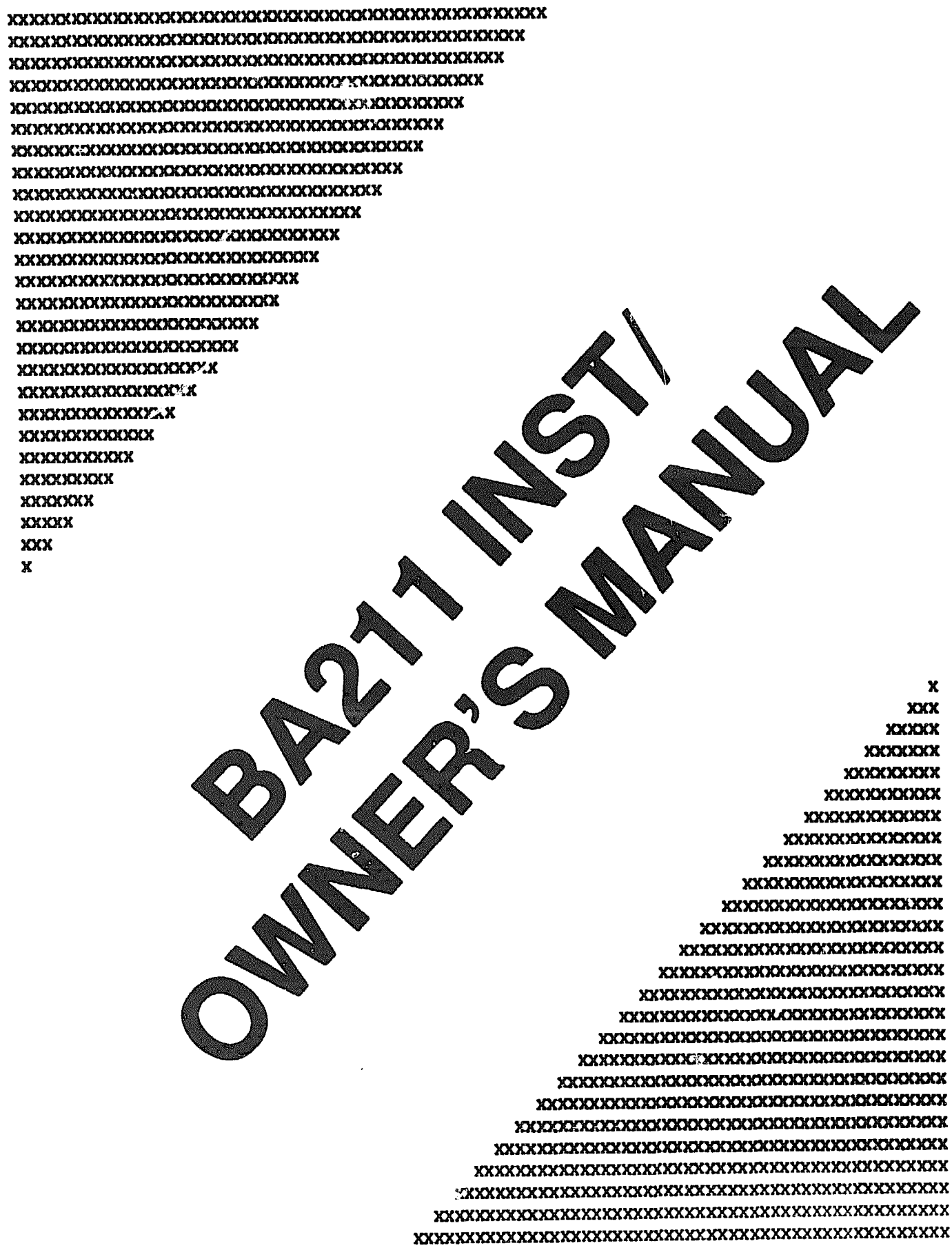
BA211 Rackmount System Document Kit (EK-BA211-DK-001)

This kit includes the latest versions of the following documents:

DOCUMENT	PART NUMBER
BA211 Rackmount System Installation/Owner's Manual	EK-BA211-IN-001
BA212 Rackmount 3400/3800 System Installation/ Owner's Manual	EK-MVX3R-IN-002
BA212 Rackmount 3400/3800 System Operation Manual	EK-MVX3R-OM-001


BA211 INST/
OWNER'S MANUAL

BA211
Rackmount System

Installation/Owner's Manual

Order Number: EK–BA211–IN–001

Prepared by
Computer Special Systems

Digital Equipment Corporation • Merrimack, NH 03054

1st Edition, August, 1990

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Printed in U.S.A.

This document was produced by Computer Special Systems Documentation Services in Merrimack, N.H.

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Preface

This customer kit describes how to use the BA211 Rackmount Systems. The hardware and software for each of these systems differ slightly, according to the function of the system.

The customer kit consists of the following parts:

- Part 1 describes the differences between the BA211 and the BA212 systems and should be read first.
- Part 2 describes the installation procedures of the BA212 system. This information applies equally to the BA211 except as noted in part 1.
- Part 3 describes the operation of the BA212 system. This information applies equally to the BA211 except as noted in part 1.
- Tabs are provided to separate the three parts of the customer kit.

Conventions

The following conventions are used in this customer kit.

Convention	Meaning
[Key]	A symbol denoting a terminal key used in text and examples in this book. For example, [Break] indicates that you press the Break key on your terminal keypad. [Return] indicates that you press the Return key on your terminal keypad.
[Ctrl/C]	A symbol indicating that you hold down the Ctrl key while you press the C key.
Bold	Bold type is used to indicate user input. For example: **>>>BOOT MUA0** This line shows that the user must type BOOT MUA0 at the ">>>" prompt.

Notes, Cautions, and Warnings

Throughout this manual Notes, Cautions, and Warnings have the following meanings.

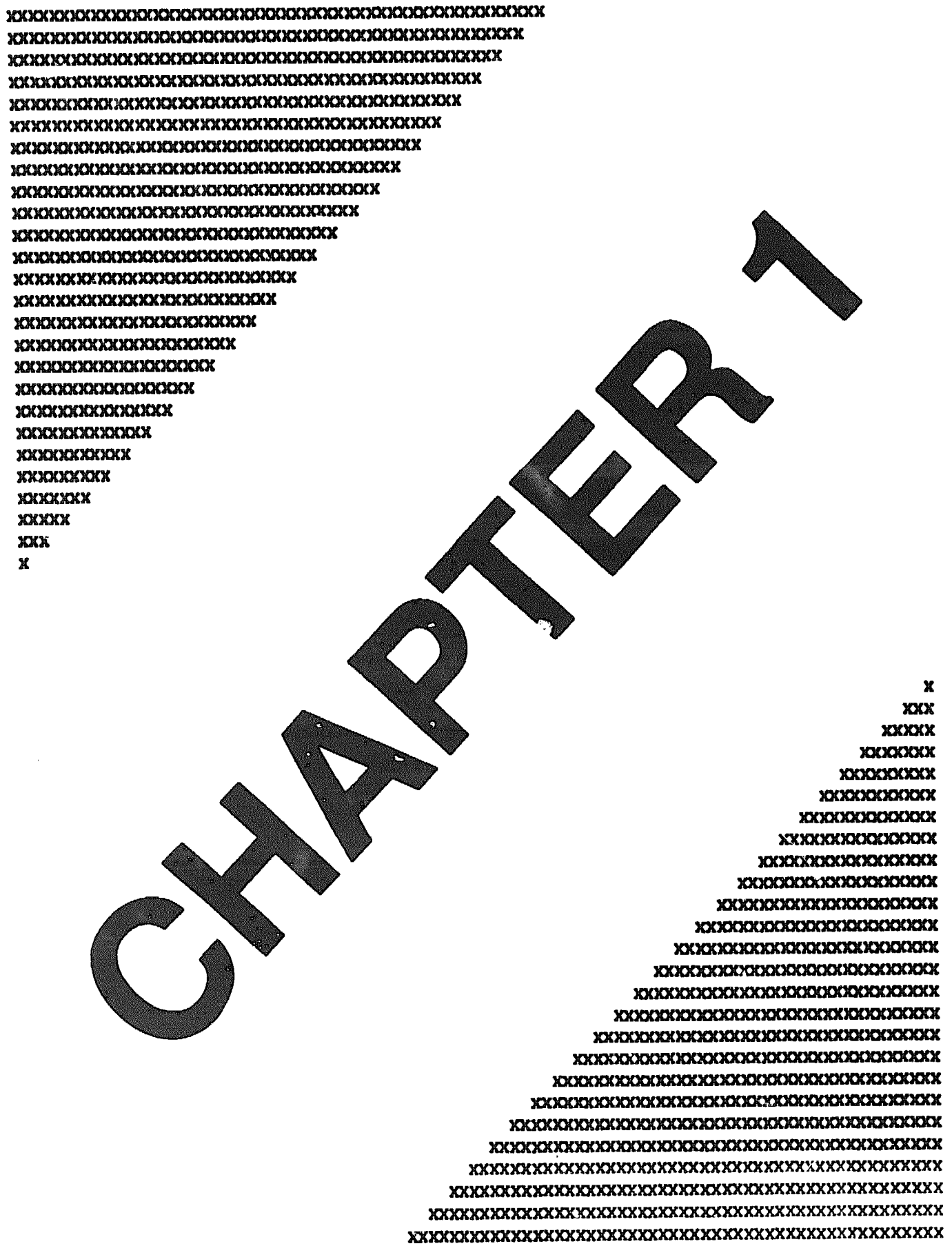
Note	A note calls the reader's attention to any item of information that may be of special importance to the reader.
Caution	A caution contains information essential to avoid damage to the system.
Warning	A warning contains information essential to the safety of personnel.

Use of the shielded MMJ cable (17-01364-02) is required to meet FCC compliance.

FCC USER STATEMENT

NOTICE:

This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such radio frequency interference. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.


CHAPTER 1

Chapter 1

BA211 System Overview

This introductory section describes the BA211 Rackmount System. The BA211 system is a six-slot version of the BA212 Rackmount 3400/3800 System.

BA211 Rackmount Systems contain all system components in a rack-mounted enclosure. The enclosure houses the following:

- Central Processing Unit (CPU)
- Memory modules
- Communications controllers
- Mass storage controllers
- RF30/RF71 fixed disk drive
- TK50/TK70 tape drive
- Power supplies

Depending on the configuration you ordered, up to two disk drives may be mounted inside the enclosure.

Table 1–1 compares the BA211 Rackmount System with the BA212 Rackmount 3400/3800 System.

Table 1–1: Comparison of BA211 and BA212 Systems

Unit	Qty	BA211 Type	Qty	BA212 Type
Tape Drive	1	TK50 or TK70	1	TK50 or TK70
ISE (Maximum)	2	RF30(2) or RF71(1)	3	RF30 and/or RF71
Backplane	1	Six-Slot	1	12-Slot
Power Supply	1	H7868	2	H7868
Control Panel	1	OCP	1	OCP
Slides	1	Set of 2	1	Set of 2

1.1 Front View of the BA211 Rackmount System

Figure 1–1 shows a BA211 Rackmount System with the front panel attached.

Figure 1–1: BA211 Rackmount System Enclosure

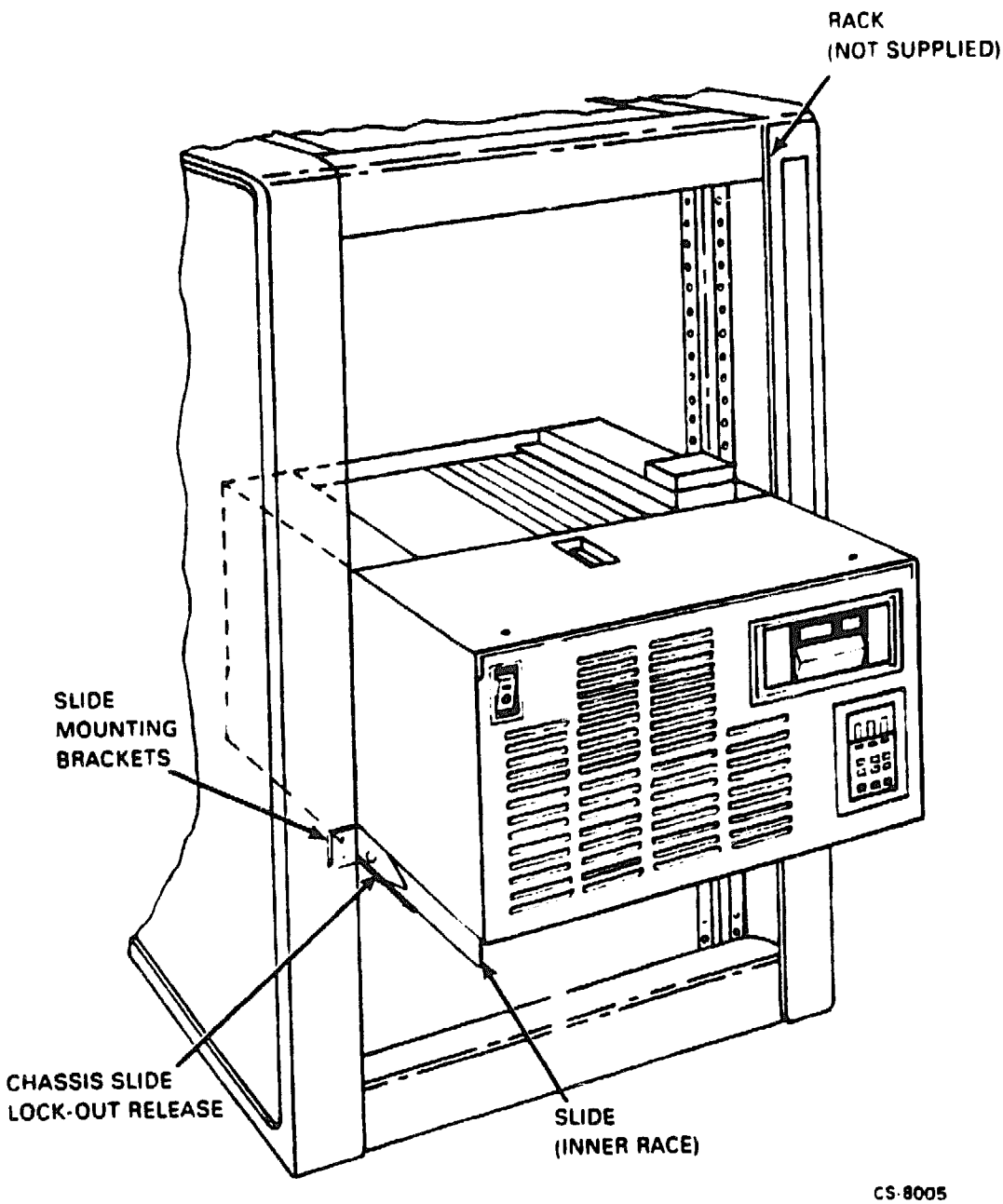
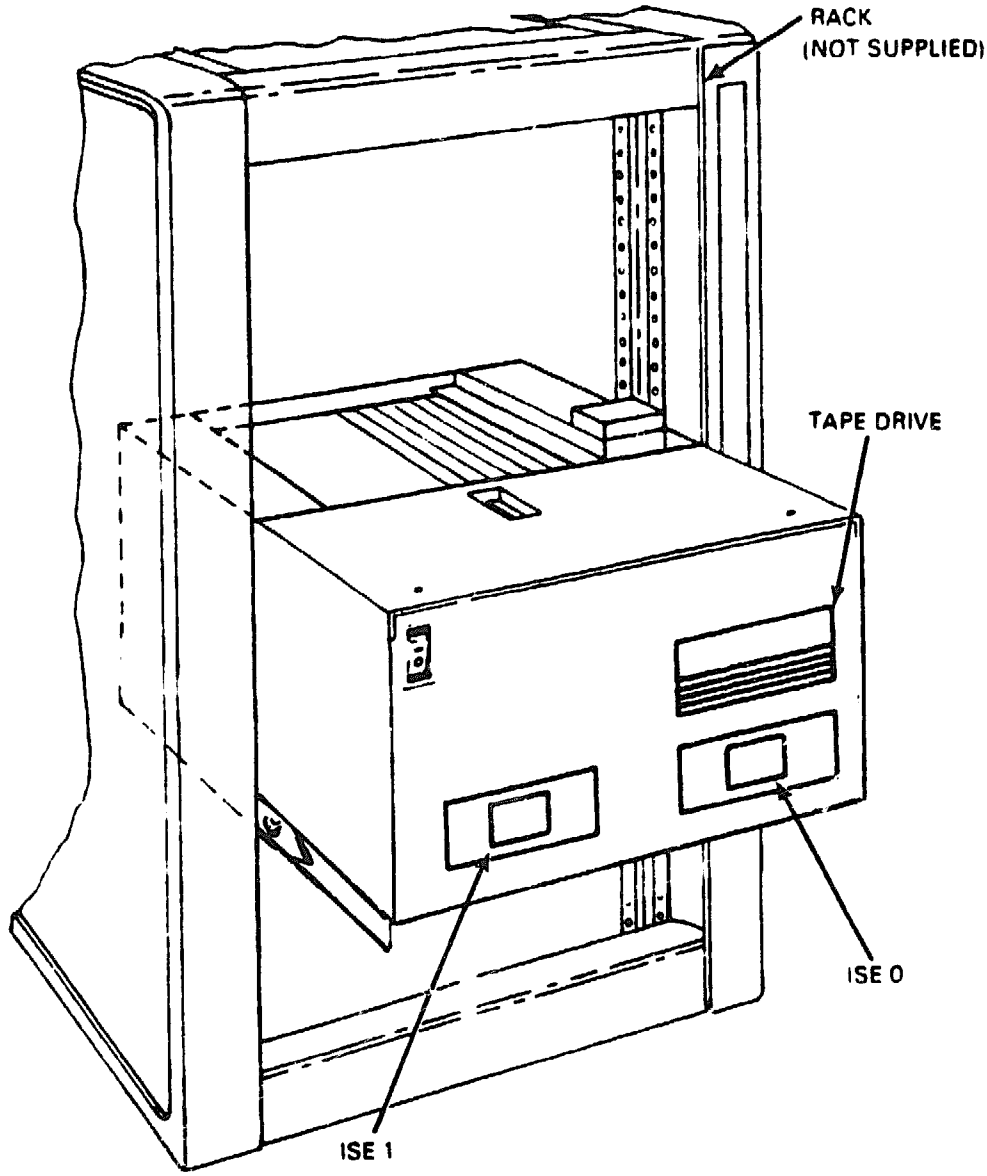


Figure 1–2 shows a typical configuration.

The enclosure contains the following:

- Mass storage—RF30 or RF71 Integrated Storage Elements (ISE) and a TK50/TK70 tape drive
- Card cage containing modules—CPU, memory, communications controllers, mass storage controllers
- Power supply (1)
- Fans (2)
- Slides (2)
- Operator Control Panel (OCP)

Figure 1–2: Top View of the Enclosure



NOTE: FRONT COVER AND OCP REMOVED FOR CLARITY.

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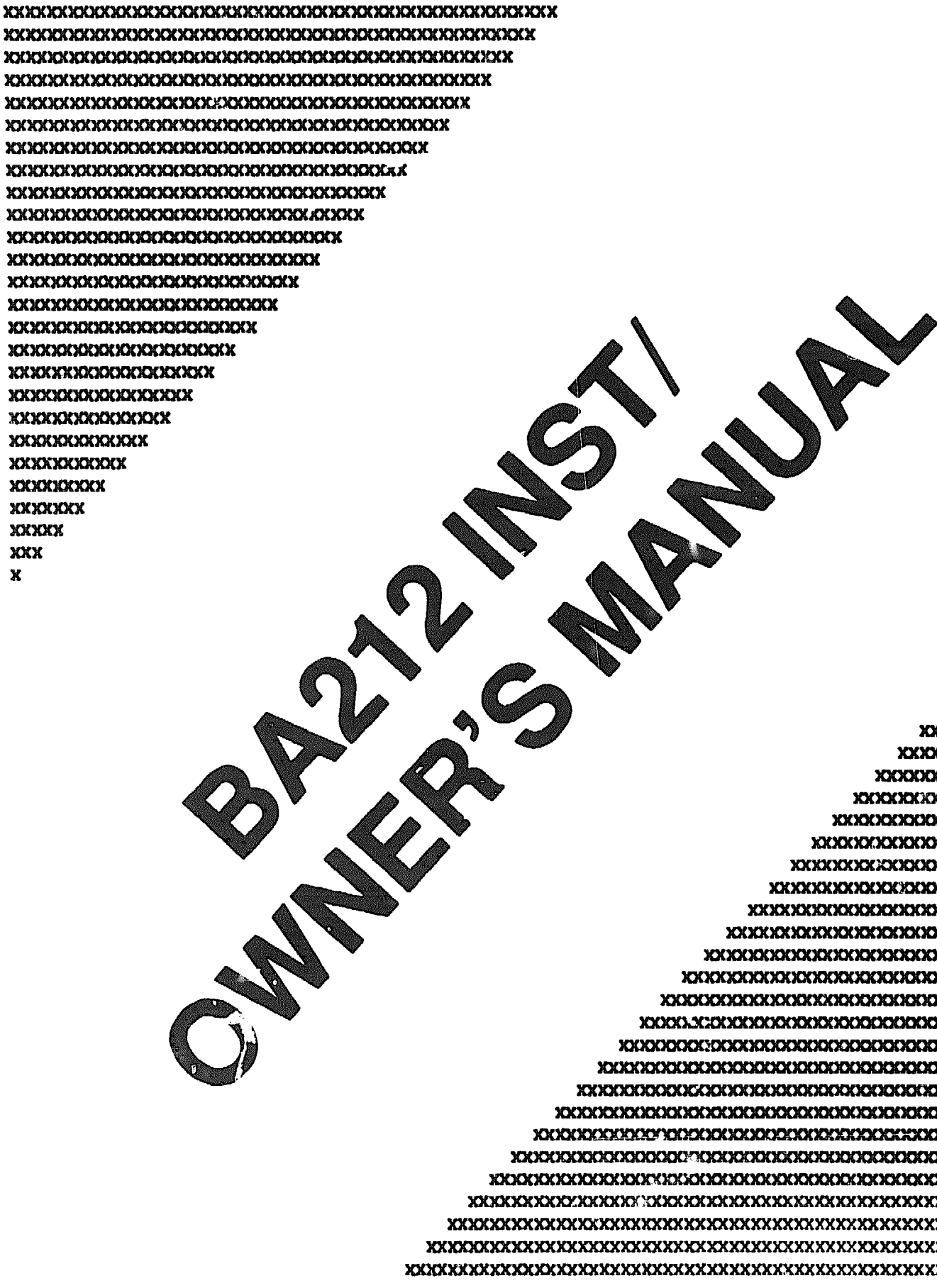
BA212 INST/
OWNER'S MANUAL

BA212
Rackmount 3400/3800 System

Installation/Owner's Manual

Order Number: EK–MVX3R–IN–002

Prepared by
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Preface

This manual describes how to install the BA212 Rackmount 3400/3800 System.

Installation includes the following steps:

1. Verifying site preparation
2. Checking the shipment
3. Placing the system in a rack
4. Installing the console terminal
5. Setting controls on the system
6. Connecting additional devices to the system
7. Connecting the power cable
8. Turning on the system and selecting a language
9. Attaching the front panel

Before installing a Digital system, review the system warranty. The terms of the warranty agreement with Digital may require that a qualified Digital service representative install the system. Contact your local Digital representative if you have any questions.

Dual-host systems must be installed by a Digital service representative. For more information on dual-host systems, refer to the *BA212 Rackmount 3400/3800 System Operations Manual*.

Related Documentation

Document	Order Number
Hardware Documentation	
BA212 Rackmount 3400/3800 System Operation	EK-MVX3R-OM
KA640 CPU Systems Maintenance	EK-179AA-MG
KA640–AA CPU Module Technical Manual	EK-KA640-TM
KA655 CPU Module Technical Manual	EK-KA655-TM
KA655 CPU System Maintenance	EK-306AA-MG
MicroVAX/VAXserver 3400 Technical Information	EK-163AA-IS
RF71 ISE Installation Manual	EK-RF71D-IN
RF71 ISE Addendum to MicroVAX 3400/3500	EK-305AA-AD
TK70 Installation Manual	EK-TK70E-IN
Software Documentation	
Overview of VMS Documentation	AA-LA95A-T
VAXELN Host System Guide	AA-JG87B-T
VAXELN Run-Time Facilities Guide	AA-JM81B-T
MicroVAX Troubleshooting and Diagnostics	EK-O19AE-SG
Microcomputer Handbook Series	
VAX Architecture Handbook	EB-19580-20
VAX Software Handbook	EB-21812-20
Microcomputer Interfaces Handbook	EB-20175-20
Microcomputers and Memories Handbook	EB-18451-20

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Use of shielded MMJ cable (17-01364-02) is required to meet FCC compliance.

1 VERIFY SITE PREPARATION

Before receiving the system, you should have received a *MicroVAX Site Preparation* manual. This manual describes the physical, environmental, and electrical requirements to operate the system.

For your convenience, a copy of this manual is also included in the Customer Hardware Information Kit. If you have not already done so, please read the manual and follow its instructions for preparing the site.

The installation instructions that follow assume that the site meets all the installation requirements listed in the *MicroVAX Site Preparation* manual. The instructions also assume that all terminal data lines, telephone lines, and network lines that you plan to connect to the system are in place and clearly labeled.

This system can be placed in a 30-inch deep (minimum) rack with characteristics as shown in Figures 1, 2, and 3.

Figure 1: System Height and Width

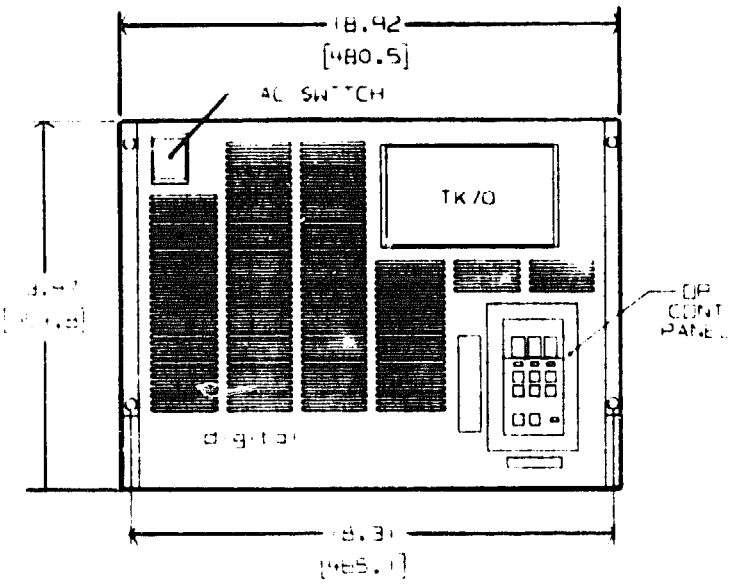

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Figure 2: Mounting Dimensions

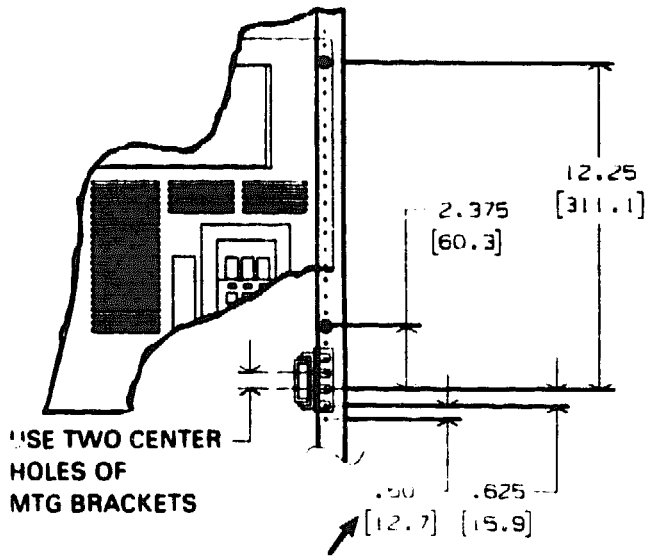

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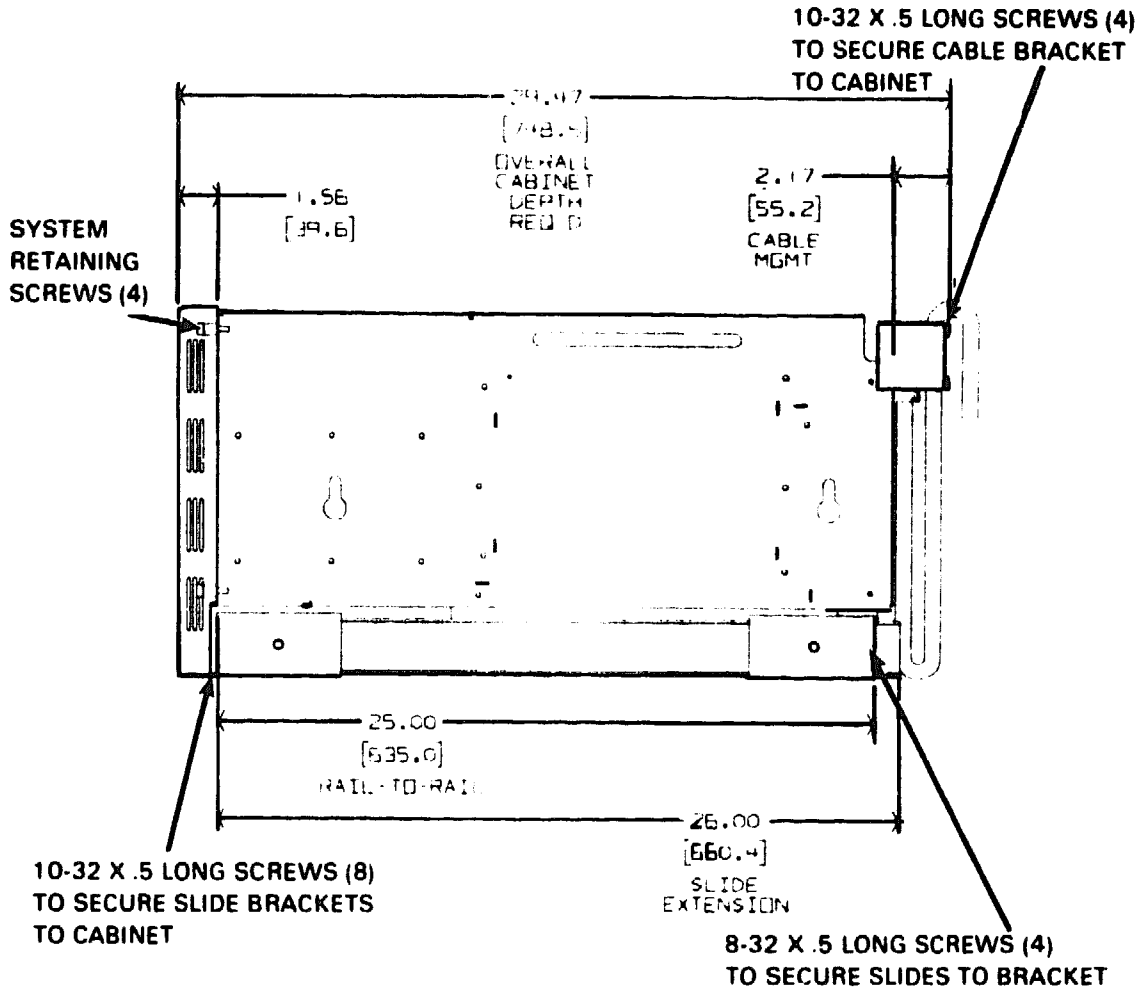
Figure 3: System Depth



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2 CHECK THE SHIPMENT

Note

Save all packing materials if you plan to reship the system.

The shipment may include several cartons, containing the following:

- The system unit.
- Cables for connecting additional devices to the system.
- Components of the console terminal, with unpacking instructions on the side.
- Software documentation, system software, diagnostic software, and a software license (this carton should be marked "Software").

Depending on the order, the shipment may also include some of the following equipment:

- Additional terminal(s)
- Printer(s)
- Modem(s)

2.1 Unpack the Shipment

Before installing the system, unpack all cartons and check the contents against the shipping list to ensure you have received everything you ordered.

If any item is missing or damaged, contact the delivery agent and contact your Digital sales representative.

Find the carton containing the system unit and unpack the system.

Table 1 describes the loose parts in the carton.

Table 1: BA212 Carton Contents

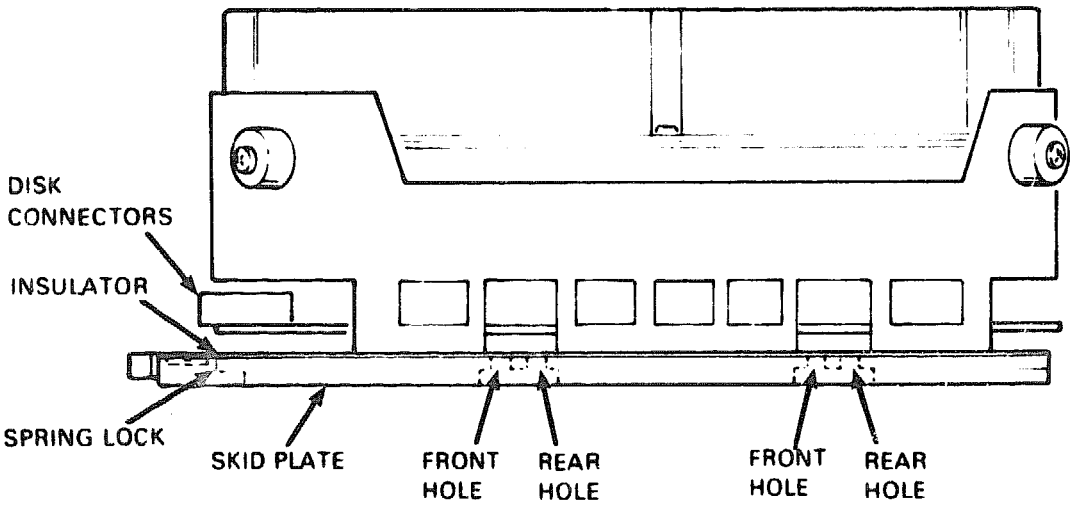
Quantity	Name	Description
1	Slide, hardware, bracket	Used to mount system to rack.
4	Insulator assembly	Used in grounding mass storage devices.
1	Accessory kit for the CPU (KA640 or KA655)	
4	Plate, skid	Used in mounting the mass storage devices.
1	Adapter, TK50/TK70	Used in mounting the TK50/TK70.
1	Bracket, cable management	Mounts on back of BA212 system chassis. Cables feed between the cable management bracket and the chassis.
40	Tie, cable	Used to tie cables to cable management bracket and to cable tie bracket.
1	Bracket, cable tie	Mounts on back of rack; cables tied to cable tie bracket using cable ties.
1	Miscellaneous hardware	Used to attach loose material.
1	*BA212 Rackmount 3400/3800 System Installation Manual* (EK-MBX3R-IN)	Describes installation of the BA212 Rackmount 3400/3800 System.
1	*BA212 Rackmount 3400/3800 System Operation Manual* (EK-MBX3R-OM)	Tells how to use the BA212 Rackmount 3400/3800 System.
1	*BA212 Rackmount 3400/3800 System Maintenance Card* (EK-MVX3R-MC)	Describes BA212 Rackmount 3400/3800 System maintenance.

3 MOUNTING SKID PLATES

Skid plates* must be mounted to the mass storage devices before they can be installed. Complete the following procedure to install skid plates on the fixed disk mass storage devices.

1. **Refer to the installation manual supplied with the disk. Use only the RF71/30-EA from the kit. All hardware required to assemble the RF71/30-EA is supplied with the BA212 Rackmount 3400/3800 System.**
2. **The disk must be mounted to the skid plate and insulator assembly as shown in Figure 4.**
3. **Attach the insulator assembly to the skid plate by pressing the spring-lock retainer in position.**
4. **Use the rear set (Figure 4) of mounting holes to secure the skid plate, with insulator assembly attached, to the disk using four (4) 6-32 pan head screws.**

Figure 4: Mounting Skid Plates to RF71 or RF30



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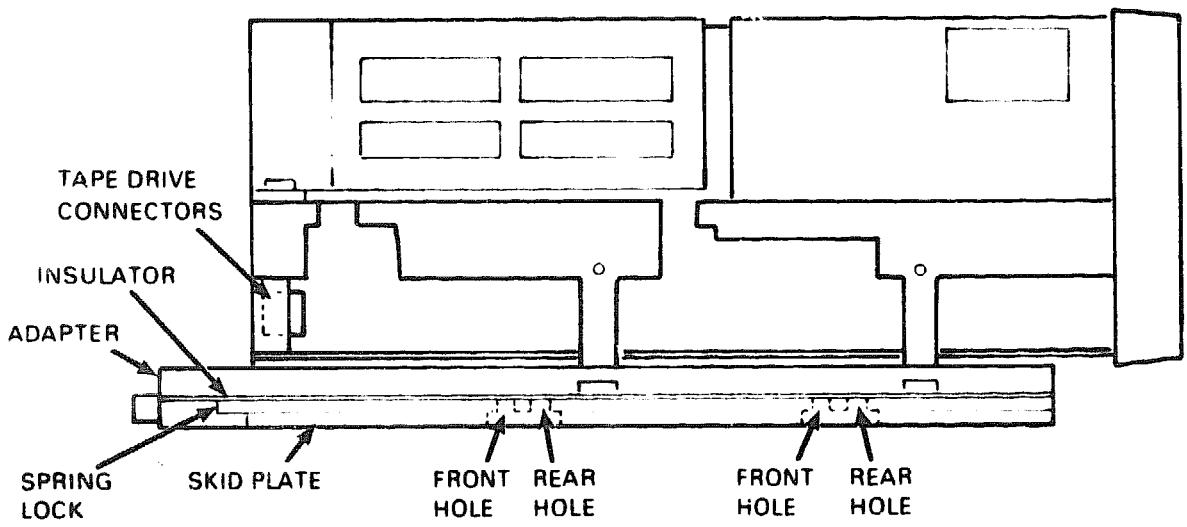
* Skid plates and insulator assembly may be supplied assembled. If so, disregard the referenced procedure.

Complete the following procedure to install the mounting hardware to the tape drive.

1. Refer to the installation manual supplied with the tape drive. Use only the TK50/70-EA. All attachment hardware is supplied with the BA212 Rackmount 3400/3800 System.
2. Refer to Figure 5 to install the adapter, insulator assembly, and skid plate.
3. Attach the adapter to the tape unit using (4) 6-32 screws such that the heads of the screws are recessed in the counterbore holes in the adapter.
4. Attach the insulator assembly to the plastic skid plate by pressing the retainer in position.
5. Use the rear set of mounting holes to secure the skid plate to the adapter plate using (4) 6-32 pan head screws.

Figure 5: Mounting Skid Plate to TK50/70-EA



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4 PLACE THE SYSTEM IN A RACK

CAUTION

Before continuing installation, verify that the system's power requirements match the power source. The correct voltage for the system is listed on the serial number label next to the left power supply. If the voltage listed matches the power source, continue with the installation. If the voltage does not match the power source, *do not* continue. Contact your Digital sales representative.

Complete the following steps to place the system in a rack (see Figures 6 and 7).

1. Mount the cable management bracket to the system with (2) 8-32 x .38 long screws.

Note

Head of screws must be on inside to clear slide travel.

2. The inner race of the slides must be removed from the slide assembly to be able to be assembled to the system. Place the slide on a firm platform (bench) with the inner race down and the black rubber bumper in the rear location. Slide the inner race until it stops and a click is heard. Release the latch within the inner race and with a forceful pull, separate the inner race from the slide assembly.

3. Assemble the inner race (single small section) to the system (two places) with (3) 8-32 x .38 long screws such that the stop tab is located near the front bezel (see Figures 1, 2, 3, 6 and 7).

4. Locate the mounting brackets (4) to the cabinet in accordance with Figure 2. Notice the starting location of the U-nuts with respect to the hole spacing in the cabinet. Ensure that all slide mounting brackets are located in the same vertical position. Use (2) 10-32 x .5 long screws for each bracket. Place the slide assembly in the brackets with the rubber bumper in the rear of the cabinet. Assemble the slides (2) to each bracket (4) using one (per bracket) 8-32 x .38 long screw and associated nuts. The screw heads must be located inside the slide race to allow an unobstructed slide travel. Secure the position of each slide such that it does not extend beyond the front slide brackets.

5. Mount the cable tie bracket on the rack with (4) 10-32 x .5 long screws and 10-32 U-nuts.

WARNING

Ensure that the cabinet is protected against tipping before installing or extending the chassis assembly.

6. Extend the leveling feet and safety foot (if available).

WARNING

The system weighs between 47.6 kg (105 lbs) and 54.4 kg (120 lbs), depending on the options installed. Use two or more people to lift the system.

7. To place the system in a rack, proceed as follows (see Figures 1, 2, 3, 6 and 7):

   a. Extend the cabinet mounted slide assembly out until they lock into position 'click'.

   b. The system, with the inner races securely fastened to the chassis, must be raised to align the inner races to the extended cabinet slides. Ensure that the inner race is properly aligned in the ball bearing channel. Slide the system, while supporting the weight, into the cabinet until both slides lock. Release slide locks (lever in the inner race) and push the system fully into the cabinet.

Figure 6: Mounting the Slides

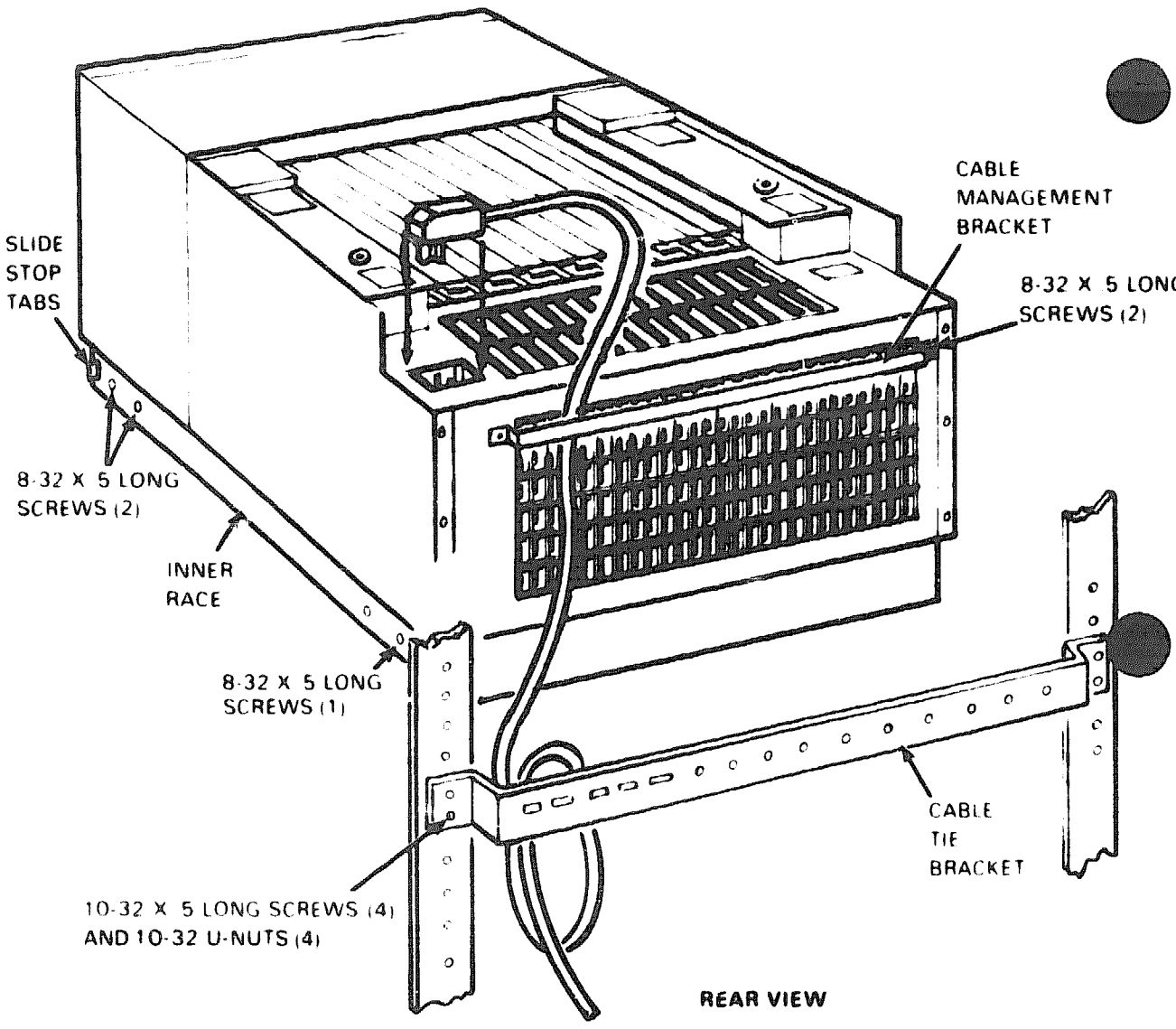
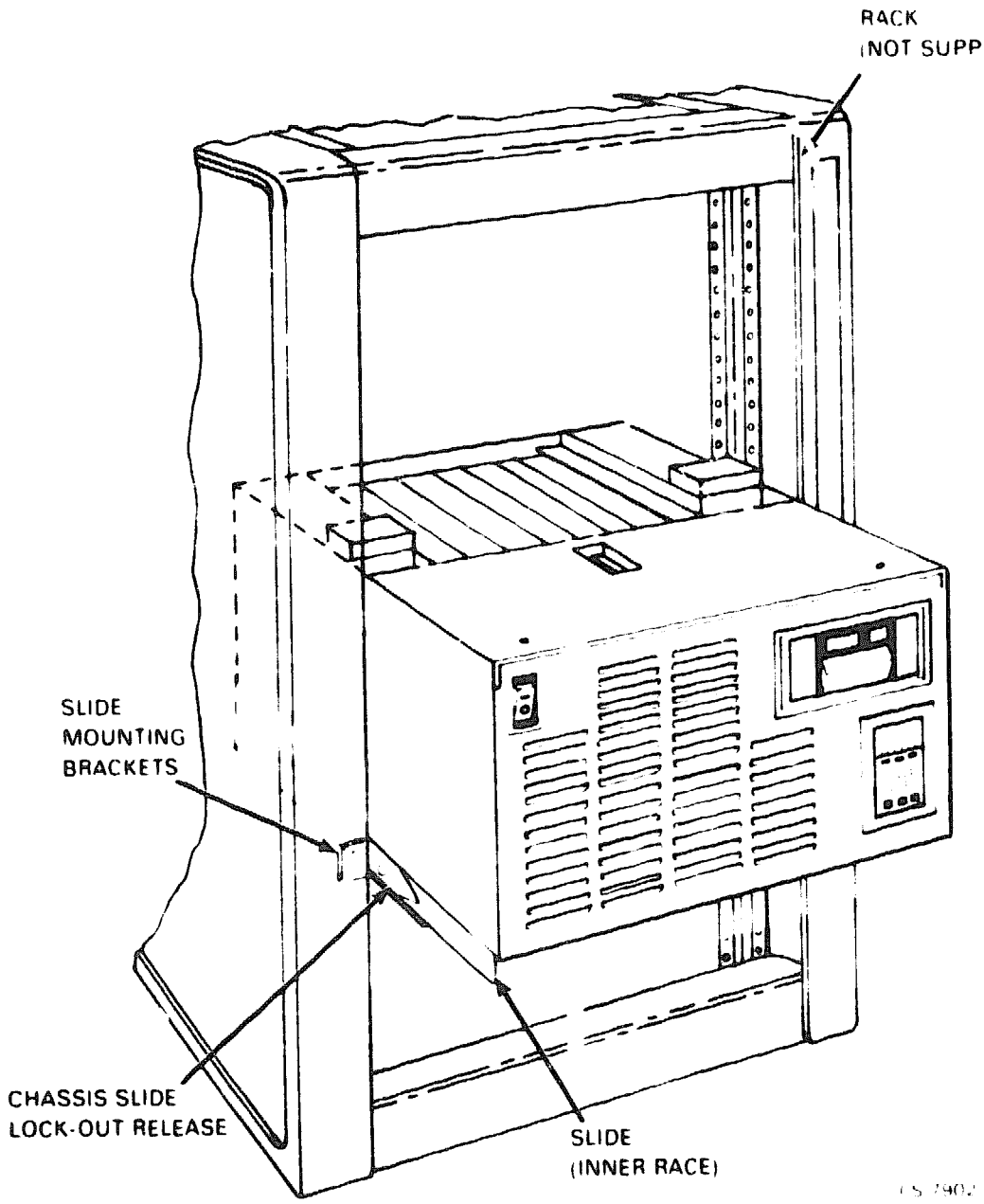


Figure 7: Placing System in a Rack



5 INSTALL OPTIONS IN THE SYSTEM

Install options as required. Refer to option documentation.

6 INSTALL THE CONSOLE TERMINAL

The next step in installing the BA212 Rackmount 3400/3800 System is to set up the console terminal. You use the console terminal to communicate with the system. The console terminal is packed with the following:

- Video monitor
- Keyboard and keyboard cable
- Console terminal power cord
- Documentation, including an installation guide and user's manual

Unpack the terminal and documentation. Use the instructions in the terminal installation guide to connect the various components of the terminal.

Read the instructions on installing and using the terminal that were provided with the console terminal. Before you connect the console terminal to the system, turn on the terminal to make sure it works correctly, and perform some set-up operations.

The terminal performs a self-test every time you turn it on. The documentation for the terminal describes a successful self-test and possible error messages that display if the terminal is not operating properly. Once the terminal passes the self-test, you should perform some set-up operations.

6.1 Perform Set-Up Operations

Set-up involves choosing how the video terminal operates. Certain parameters must be selected so that the terminal can communicate with the system: the terminal's baud rate should be set to 9600, and receive speed should be set equal to the transmit speed.

You choose set-up options from a series of menus that are displayed by pressing the Set-Up key on the terminal keyboard. Set-up instructions for terminals vary according to model, or in some cases according to which Read-Only Memory (ROM) cartridge is installed in the terminal. Be sure to read the documentation provided with the terminal.

While most default settings are acceptable, you should perform the set-up procedure for the terminal to ensure appropriate set-up values. The example below provides set-up instructions for VT300-series terminals.

For VT300-Series Terminals

1. Press [Set-Up] to display the Set-Up Directory screen.
2. Use the arrow keys to select the "Communications Set-Up" option and press [Enter].
3. Make sure the "Transmit Speed" option in the "Current Setting" column is set to 9600. Use the left and right arrow keys to change the setting.
4. Make sure the "Receive Speed" option in the "Current Setting" column is set to "receive=transmit." Use the down arrow to move the cursor to this option, and the left and right arrows to change the setting.
5. Press [Select] to return to the Set-Up Directory screen.
6. Use the arrow keys to select the "Global Set-Up" option. Press [Enter] to display the Global Set-Up screen and use the arrow keys to select the "Comm1 Port" option.
7. If the port in the "Current Setting" column is selected for "RS-232", press [Enter] to select the "DEC-423" port.
8. Press [Select] to return to the Set-Up Directory screen.
9. Use the arrow keys to select the "Save Current Settings" option. Press [Enter] to save all current settings, then press [Set-Up] to exit the Set-Up Directory.

Once you have tested the terminal and performed set-up operations, you are ready to connect the console terminal to the system.

6.2 Connect the Console Terminal to the System

Connecting the console terminal to the system involves attaching one end of an MMJ cable (17-01364-02) to the cover panel of the Central Processing Unit (CPU) module and the other end of the cable to a communications port in the back of the terminal. The CPU cover panel covers slots 1 and 2. The port on the back of the console terminal varies with the type of terminal.

For VT300-Series Terminals

Connect the console terminal to the system as follows:

1. Turn off the console terminal.
2. Find the terminal cable in the accessories box. The cable is labeled "shielded cable" and has a DEC-423 modular plug on each end.
3. Connect the terminal cable to the DEC-423 modular jack labeled "1" on the rear of the terminal, according to the instructions in the terminal installation guide. Connect ground to CPU cover panel.
4. Feed the other end of the cable from the back of the rack. Draw up the cable and plug it into the DEC-423 modular jack labeled "A1" on the CPU cover panel, as shown in Figures 8 and 9. Connect ground to connector lugs on the terminal.

You are now ready to set the controls on the system.

Figure 8: Connecting a 3400 System to a VT300-Series Terminal

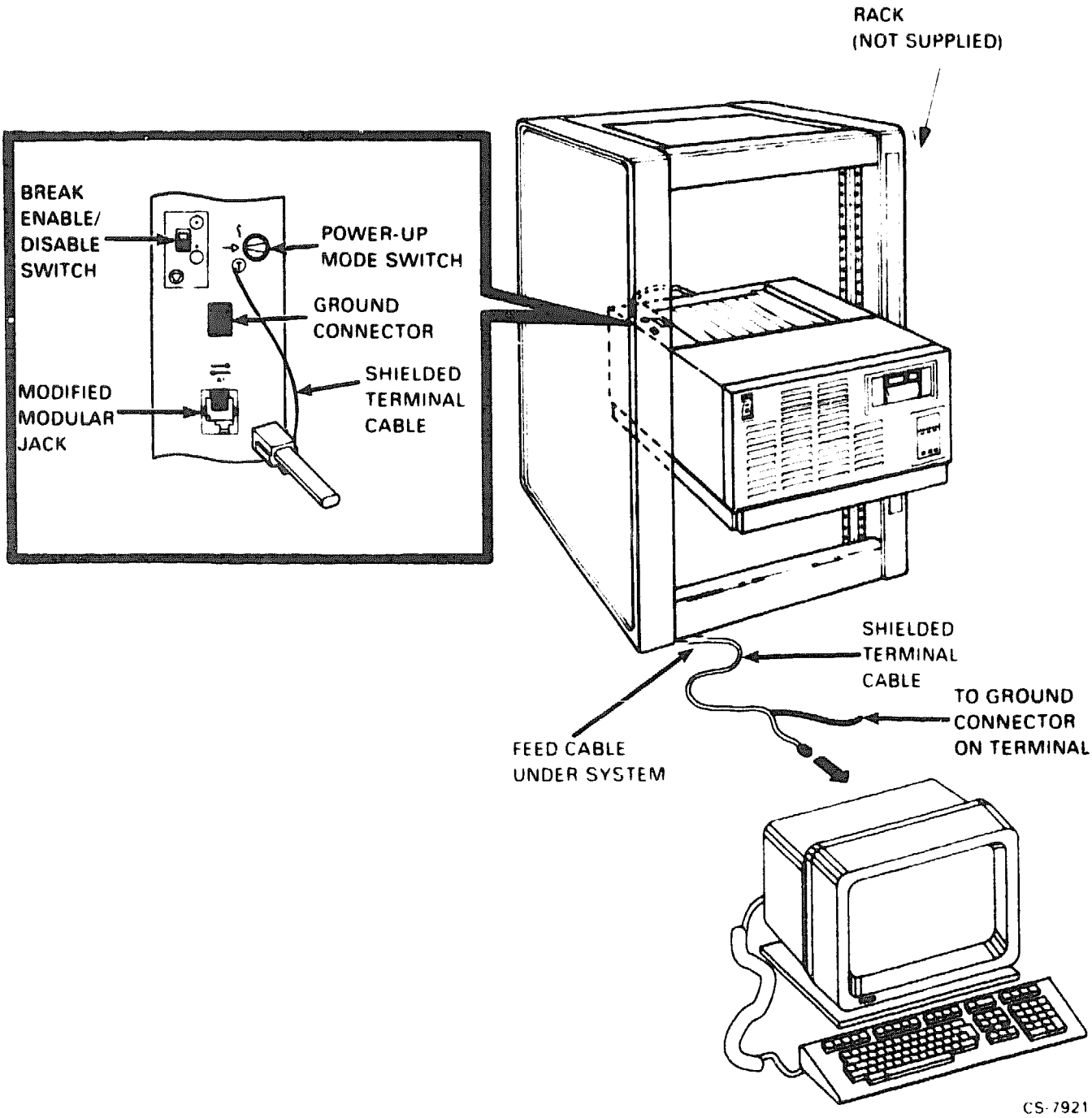
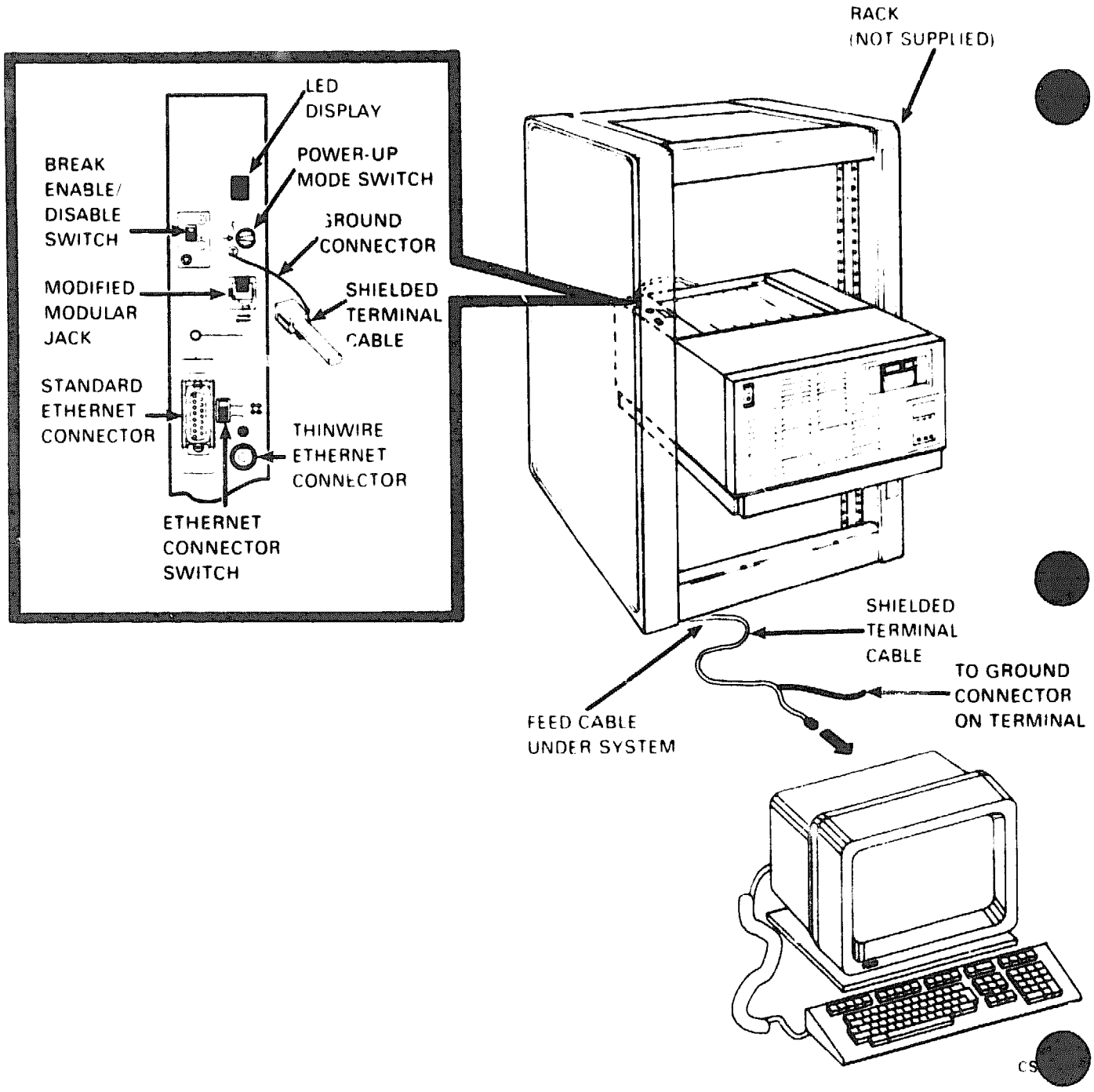


Figure 9: Connecting a 3800 System to a VT300-Series Terminal



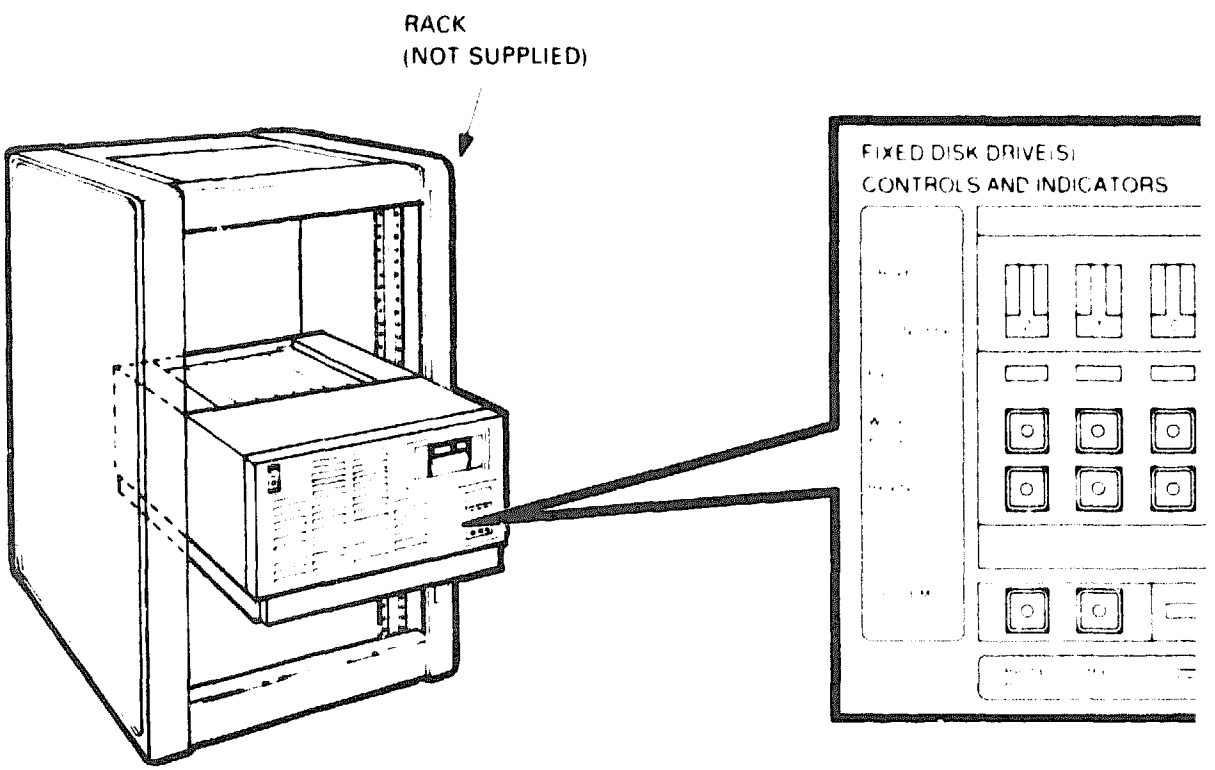
7 SET CONTROLS ON THE SYSTEM

7.1 Operator Control Panel (OCP) Controls

Operator Control Panel (OCP) controls are on the front of the chassis, as shown in Figure 10.

The BA212 Rackmount 3400/3800 System has either RF30 or RF71 fixed-disk drives. The fixed-disk drives are behind the panel that contains controls and indicators for each of the drives. Make sure the write-protect switches are in the out (write enabled) position and the halt button is in the out position (not lit).

Figure 10: Operator Control Panel (OCP) Controls



NOTE: SELECT REQUIRED LABELS FROM KIT 36-29341-01. LOCATE AS SHOWN USING THE RECESSED EDGE AND INDICATORS AS AN ALIGNMENT GUIDE.

7.2 CPU Controls

The following controls are located on the CPU cover panel covering slots 1 and 2. (See Figures 8 and 9.)

- Break Enable/Disable Switch. The factory setting is break disable, indicated by the dot outside the circle. Leave the switch set to disable while you start the system for the first time and run diagnostic software to test the system. With break disabled, the system automatically boots software when powered up.
- Power-Up Mode Switch. This three-position rotary switch determines how the system powers up. The factory setting is Run Mode, indicated by an arrow. Set the switch to the Language Inquiry Mode, indicated by a human profile, before you power up the system the first time.
- Baud Rate. The baud rate switch is on the inside of the panel covering the CPU module. The factory setting is 9600. You should have already set the console terminal baud rate to 9600 (refer to Section 6.1). The system and the terminal must be set to the same baud rate to communicate.
- Ethernet Connector Switch (3400 System Only). This two-position switch determines which of the two Ethernet connections is enabled. If the switch is in toward the top of the CPU cover panel, the standard Ethernet connector is enabled and an Ethernet transceiver cable should be connected. When the switch is in toward the bottom of the CPU cover panel, the ThinWire Ethernet connector is enabled. When the system is turned on, the LED associated with the selected connector lights.

You are now ready to connect additional devices to the system.

8 CONNECT ADDITIONAL DEVICES TO THE SYSTEM

You can connect additional devices at this time, or you can complete installation and load system software before connecting other devices. Skip to the next step if you prefer to connect additional devices later. Use the instructions in this step when you are ready to connect the devices.

You make all connections directly to the module cover panels. As you complete connections for each module, move to the next module. The next five sections explain how to connect each type of device.

To help you make the proper connections, each module cover has an identifying label. The label contains the option number and module number. Table 2 lists the identifying labels for all modules requiring connections. Use Table 2 to identify the modules as you connect additional devices to the system.

Table 2: Module Identification Labels

Module Number	Option Number	Description
M7624-CA	KA640-AA	MicroVAX 3400 CPU
M7624-DA	KA640-BA	VAXserver 3400 CPU
M7625-AA	KA655-AA	MicroVAX 3800 CPU
M7625-BA	KA655-BA	VAXserver 3800 CPU
M7621-A	MS650-AA	8MB memory
M7622-A	MS650-BA	16MB memory
M7942	MRV11-D	Programmable read-only memory
M3127-PA	DESQA	Ethernet controller
M3118-YA	CXA16	16-line asynchronous serial interface (RS-423-A, no modem support)
M3118-YB	CXB16	16-line asynchronous serial interface (RS-422, noise immune)
M3119-YA	CXY08	8-line asynchronous serial interface (full modem support)
M7957	DSV11	2-line synchronous serial interface (full modem support)
M8053/M8064	DMV11-SA	Multipoint DDCMP synchronous line controller
M3121	DFA01	2-line asynchronous serial interface with integral modem
M8020	DPV11	Synchronous serial line interface
M8086-SA	LPV11	Dual parallel printer interface
M7546	TKQ50	TK50 tape drive controller
M7559	TKQ70	TK70 tape drive controller
M7206-PA	TSV05	TSV05 tape drive controller
M7740	KLESI	RV20 write-once optical disk controller

Table 2 (Cont.): Module Identification Labels

Module Number	Option Number	Description
M7500	KMV1A	Programmable data communications interface
M7658-PA	DRQ3B-SA	Real-time parallel interface
M7651-PA	DRV1W-SA	Real-time parallel interface
M8634-PA	IEQ11-SA	IEEE instrument bus DMA controller
M3125-PA	IBQ01-SA	Bitbus-to-Q-bus DMA controller
A1009-PA	AAV11-SA	Digital-to-analog converter
A1008-PA	ADV11-SA	Analog-to-digital converter
A030-PA	ADQ32	Analog-to-digital converter
M4002-PA	KWV11-SA	Programmable real-time clock
A026-PA	AXV11-SA	D/A and A/D converter

CAUTION

Do not operate the system without Digital-supplied module cover panels. The module cover panels are required to protect the equipment and to meet international regulatory standards. Do not substitute other cover panels as they may not meet the required specifications.

Operating the system without the module cover panels, has the following consequences:

- **The system may overheat due to inadequate air circulation.**
- **The system will not comply with FCC and VDE requirements for shielding, and may produce electrical interference that affects other equipment.**
- **The system is susceptible to electrical interference or damage from external sources.**

8.1 Connect Terminals and Serial Printers

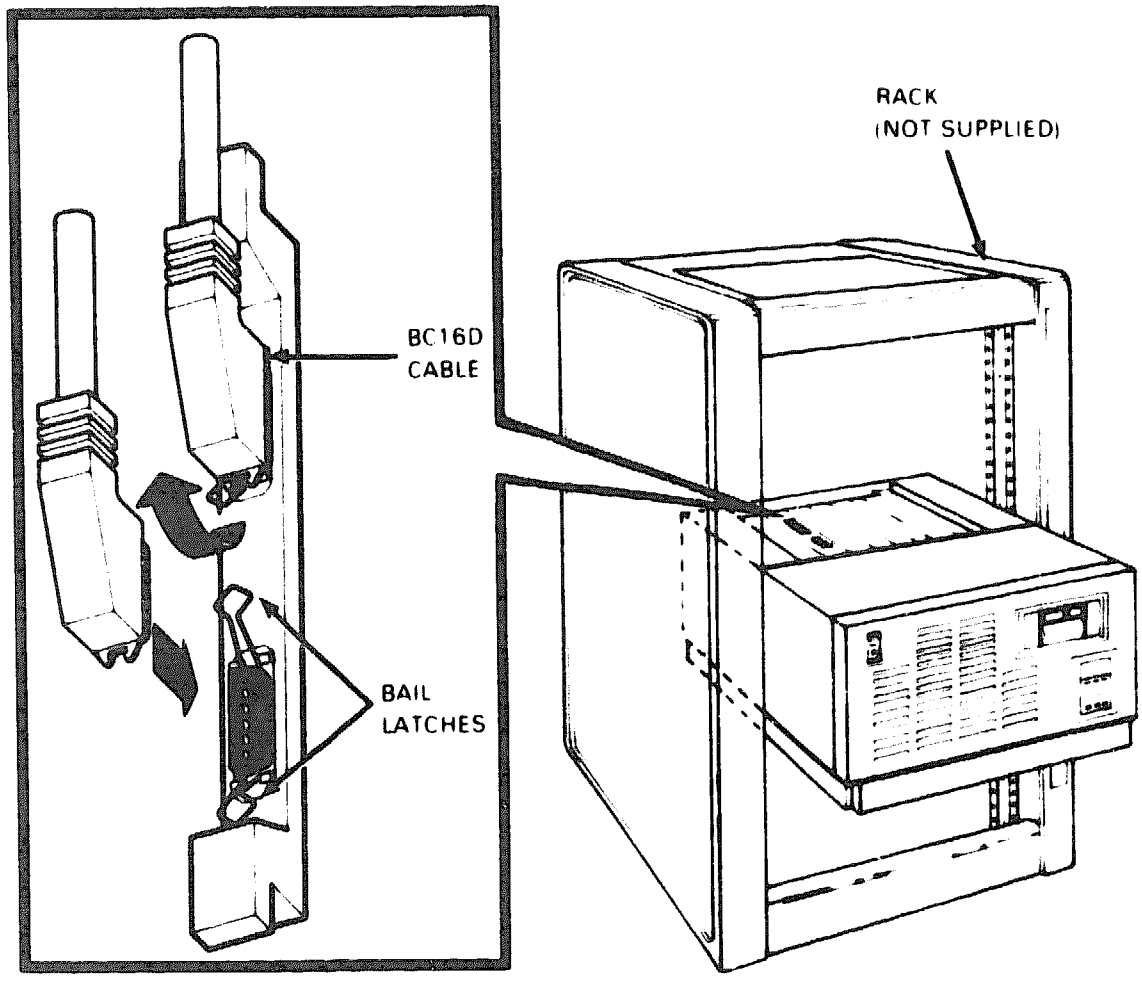
You can connect up to 16 terminals and/or serial printers for each CXA16 or CXB16 module installed in the system. If the site has been prepared properly, the lines for the additional terminals and printer(s) are clearly labeled, and terminate near the system.

You do not connect the terminals and printers directly to the system, but to a cable concentrator (H3104), which has connections for up to eight terminals and printers. You then connect the cable concentrator to the system with a shielded terminal cable. The cable carton contains two H3104 cable concentrators and two shielded terminal cables for each CXA16 module in the system.

Connect the additional terminals and printers as follows:

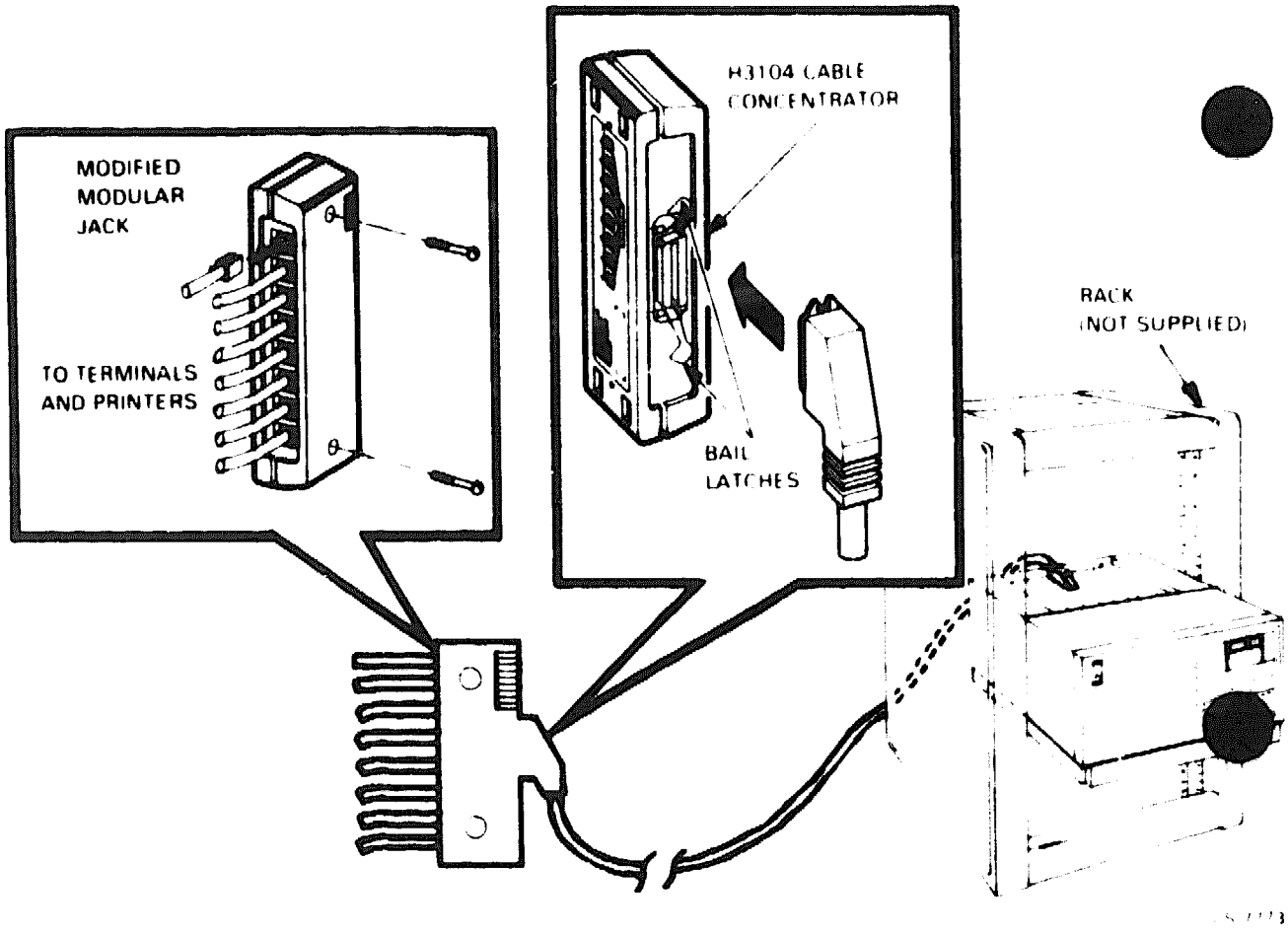
1. Find the H3104 cable concentrator and BC16D cable in the cable carton.
2. Feed one end of the BC16D cable from the back of the rack and plug it into the connector. If you are going to connect both BC16D cables, connect the first to the connector labeled 8-15 on the CXA16 cover panel. If you are going to use only one BC16D cable, connect the cable to the connector labeled 0-7. Lock the connector into place by using the bail latches shown in Figure 11.

Figure 11: Connecting Devices to the CXA16 Module



3. Plug the other end of the BC16D cable into the cable concentrator. Lock the connector into place by using the bail latches.
4. Connect each printer and terminal cable directly to one of the modified modular jacks on the cable concentrator, as shown in Figure 12.

Figure 12: Connecting Devices to the Cable Concentrator



5. If not already connected, connect the remote terminal or printer to the other end of the cable. The terminal or printer documentation shows how to connect the cable. If the printer or terminal does not have a modified modular jack connection, use a passive adapter, available in 25- and 9-pin models.

Follow the same procedure for connecting a second BC16D cable to the CXA16, except plug the cable into the connector labeled 0-7.

You can mount the cable concentrator on a wall. Wall mounting enables you to keep cables off the floor.

Note

Be sure that you mount the cable concentrator less than 7.6 meters (25 feet) from the system to ensure that the BC16D cable reaches the system.

8.2 Connect Parallel Printers to the System

You can connect up to two parallel printers for each LPV11 module installed in the system.

Connect parallel printers to the LPV11 module as follows:

1. Find the BC27L–30 cable(s) in the cable carton.
2. Feed one end of the first BC27L cable from the back of the rack. Plug it into the connector labeled J1 on the LPV11 cover panel. Lock the connector into place by using the bail latches.
3. Plug the other end of the BC27L cable into the printer.

Follow the same procedure for connecting a second printer to the LPV11 module, except plug the cable into the connector labeled J2 on the LPV11 cover panel.

8.3 Connect Synchronous Modems to the System

You can connect one synchronous modem to the system for each DPV11 or KMV1A module installed in the system.

Connect a synchronous modem to a DPV11 or KMV1A module as follows.

1. Find the BC22E or BC22F cable in the cable carton.
2. Feed one end of the cable from the back of the rack. Plug it into the connector on the DPV11 or KMV1A cover panel. Lock the connector into place by using the bail latches.
3. Plug the other end of the cable into the modem. Refer to the modem documentation for the location of the connector and for instructions on using the modem.

8.4 Connect Asynchronous Modems to the System

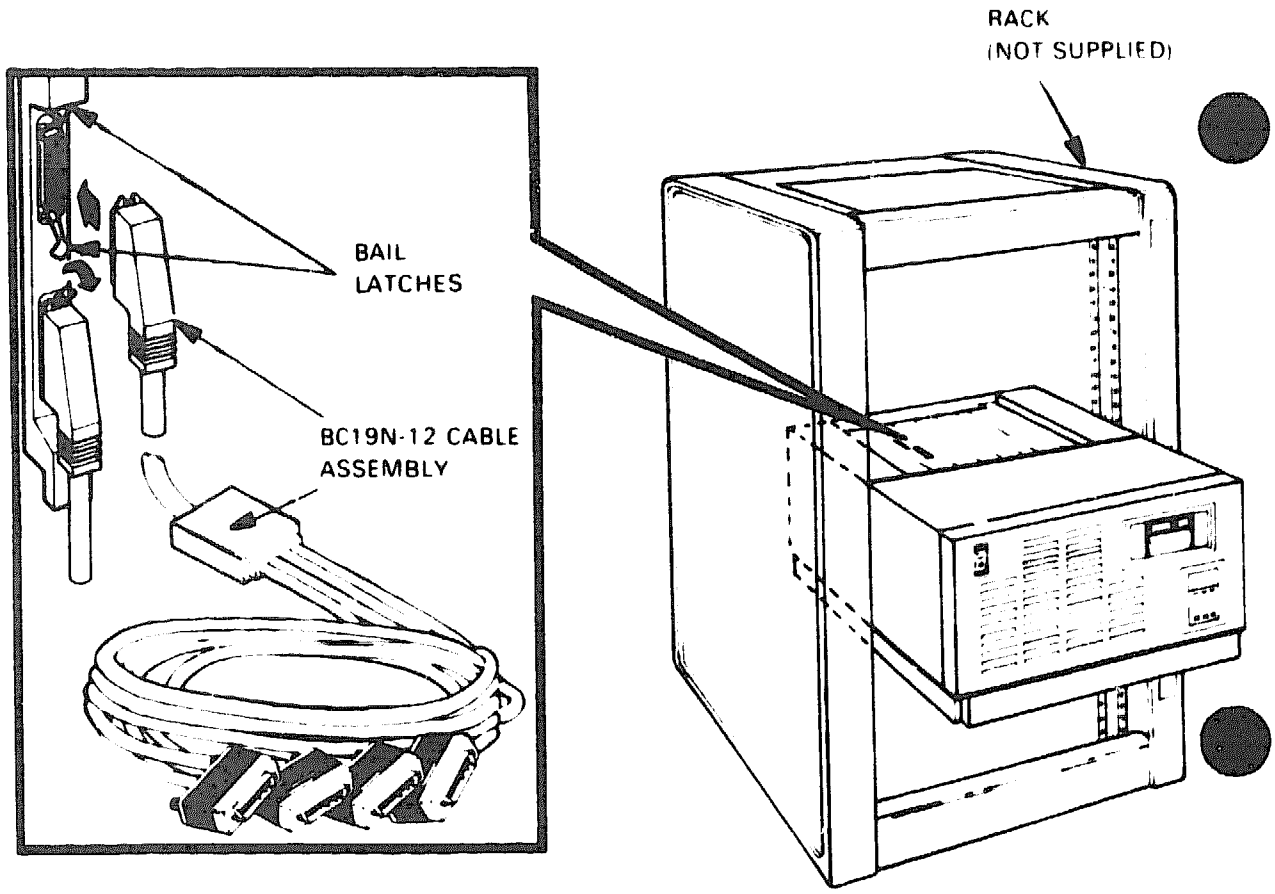
You connect asynchronous modem lines to the CXY08 module, which supports up to eight lines.

To connect a modem to a CXY08 module, see Figure 13, and refer to the following instructions:

1. Find the BC19N-12 cable assembly in the cable carton.
2. Feed the end of the large cable from the back of the rack and plug it into the connector. If you are going to use both BC19N-12 cables, connect the first to the connector labeled 4-7 on the CXY08 cover panel. In you are going to use only one cable, connect the cable to the connector labeled 0-3. Lock the connector into place with the bail latches.
3. Attach a modem to one of the four connectors at the opposite end of the cable assembly. If you want to place the modem farther away from the system, attach a BC22F modem cable between the cable assembly and the modem. Refer to the modem documentation for the location of the connector, and for instructions on using the modem.

Repeat the same procedure for connecting a second BC19N cable assembly, except plug the cable into the connector labeled 0-3.

Figure 13: Connecting a Modem to a CXY08 Module



8.4.1 Connect Module for an Internal Modem to Telephone Lines

Note

The DFA01 modem is available for United States and Canadian customers. Depending on the country you live in, the Telecommunication Administration (PTT) may not allow you to connect private integral modems to the public switched telephone network. Call your Digital representative for information on modem availability in the country.

DFA01 Modem

You connect the DFA01 module to telephones lines. The DFA01 module supports two modems, modem A and modem B. Each modem requires its own telephone.

The DFA01 modem connects to the following basic types of dial-up telephone service:

- RJ11C (United States) and CA11A (Canada) standard single-line telephone service. The switchpacks are factory set for this service. (If you have this service, you have one wall-mounted modular telephone jack per telephone.)
- RJ12C/RJ13C (United States) and CA12A/CA13A (Canada) telephone service. The switchpacks are factory set for this service. (If you have this service, you have one wall-mounted modular telephone jack per telephone.)
- RJ41S/RJ45S (United States) and CA41A/CA45A (Canada) data jack telephone service. (If you have this service, you have two wall-mounted modular telephone jacks per telephone.)

Note

If you do not know which telephone service you are using, call the telephone company. Information about the type of telephone service you are using is readily available to you as a telephone customer.

RJ11C/CA11A, RJ12C/CA12A, and RJ13C/CA13A Service

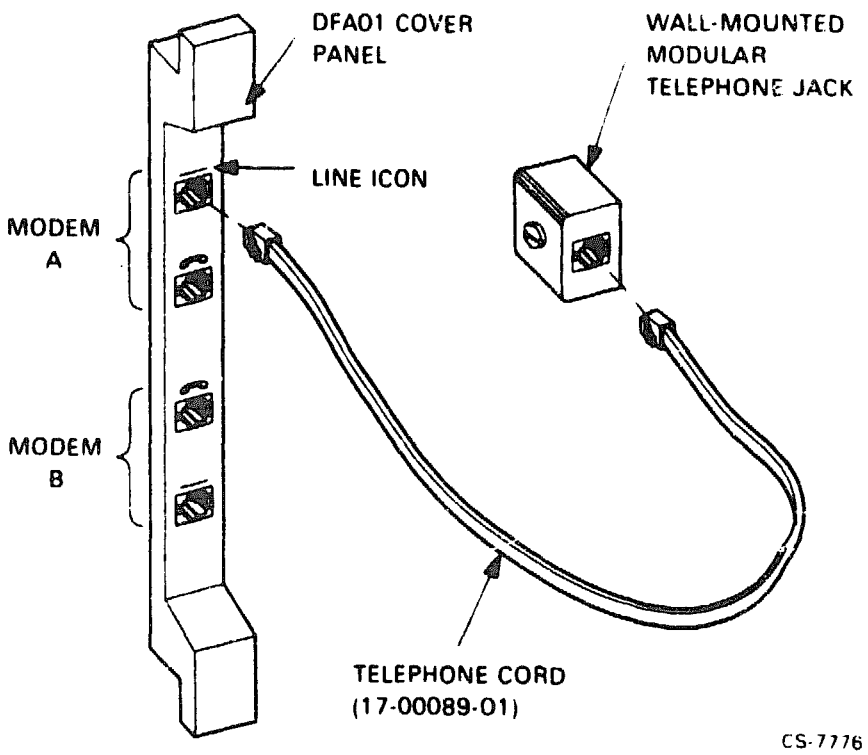
Use the following procedure to connect the DFA01 modem to RJ11C/CA11A, RJ12C/CA12A, or RJ13C/CA13A service.

Note

If you plan to use both modem A and modem B, you will need two telephones, one for each modem.

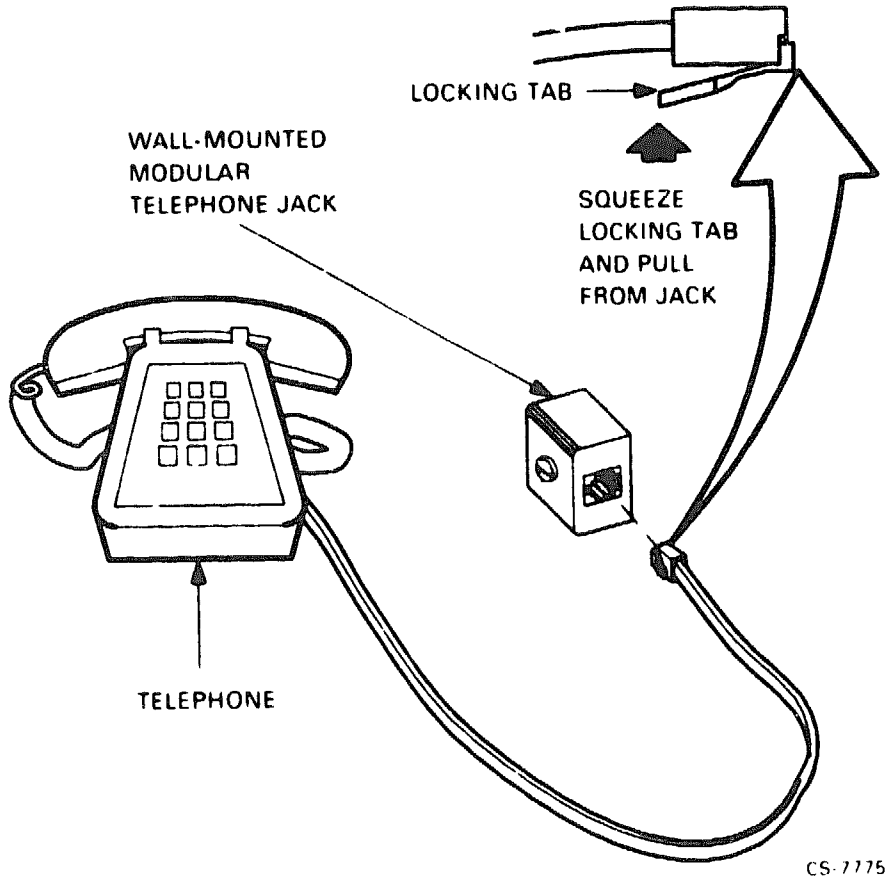
1. Disconnect the telephone line from the wall-mounted modular telephone jack. Leave the telephone line connected to the telephone, as shown in Figure 14.

Figure 14: Disconnecting the Telephone Line (Single- and Multi-Line Service)



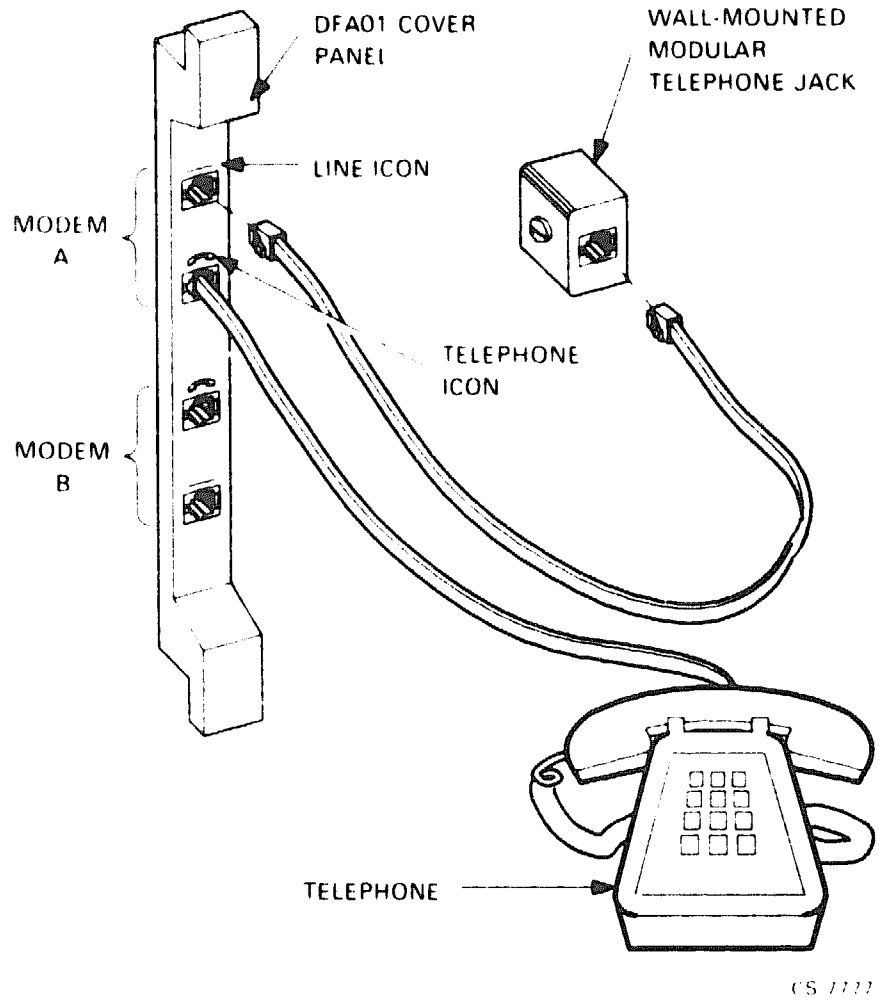
2. Take one end of one of the cords included with the DFA01 modem (17–00089–01) and plug it into the first jack on the DFA01 cover panel marked with the line icon, as shown in Figure 15.

Figure 15: Installing Telephone Cord (Single- and Multi-Line Service)



3. Connect the other end of the cord to the wall-mounted telephone jack.
4. To install voice communication on modem A, take the end of the telephone line that you disconnected from the wall jack in step 1 and connect it to the first jack on the DFA01 cover panel marked with the telephone icon, as shown in Figure 16.

Figure 16: Connecting Modem to Telephone (Single- and Multi-Line Service)



If you do not plan to use modem B, do not perform the following step. If you require use of a second modem, set up modem B for use by continuing with step 5.

5. Using a second telephone, set up modem B by following the same procedure used to engage modem A. Notice, however, that the jack positions on the DFA01 cover panel are reversed for modem B. The second jack on the DFA01 cover panel marked with a line icon is shown in Figure 15. Connect the wall-mounted modular jack to the last jack from the top of the DFA01 cover panel. Connect the telephone line to the second to last jack from the top of the cover panel.

RJ41S/CA41A and RJ45S/CA45A Service

Use the following procedure to connect the modem to RJ41S/CA41A and RJ45S/CA45A data jack service. You will need a standard eight-wire telephone cord (not supplied with the DFA01 modem). If you have this service, you have two wall-mounted modular telephone jacks per telephone.

Note

If you plan to use both modem A and modem B, you will need two telephones, one for each modem.

Do not unplug the telephone line from the wall-mounted modular telephone jack.

1. Connect one end of an eight-wire telephone cord (not supplied with the DFA01 modem) into the first jack on the DFA01 cover panel marked with the line icon.
2. Connect the other end of the telephone cord into a second wall-mounted modular telephone jack, as shown in Figure 17.

   If you require voice communication on modem A, refer to step 4 for more information.
3. If you do not plan to use modem B, skip this step and proceed to step 4. If you plan to use modem B, connect a second eight-wire telephone line to the second jack on the DFA01 cover panel marked with a line icon. (Notice that the jack positions are reversed for modem B.) Connect the other end of the cord to a wall-mounted modular telephone jack.

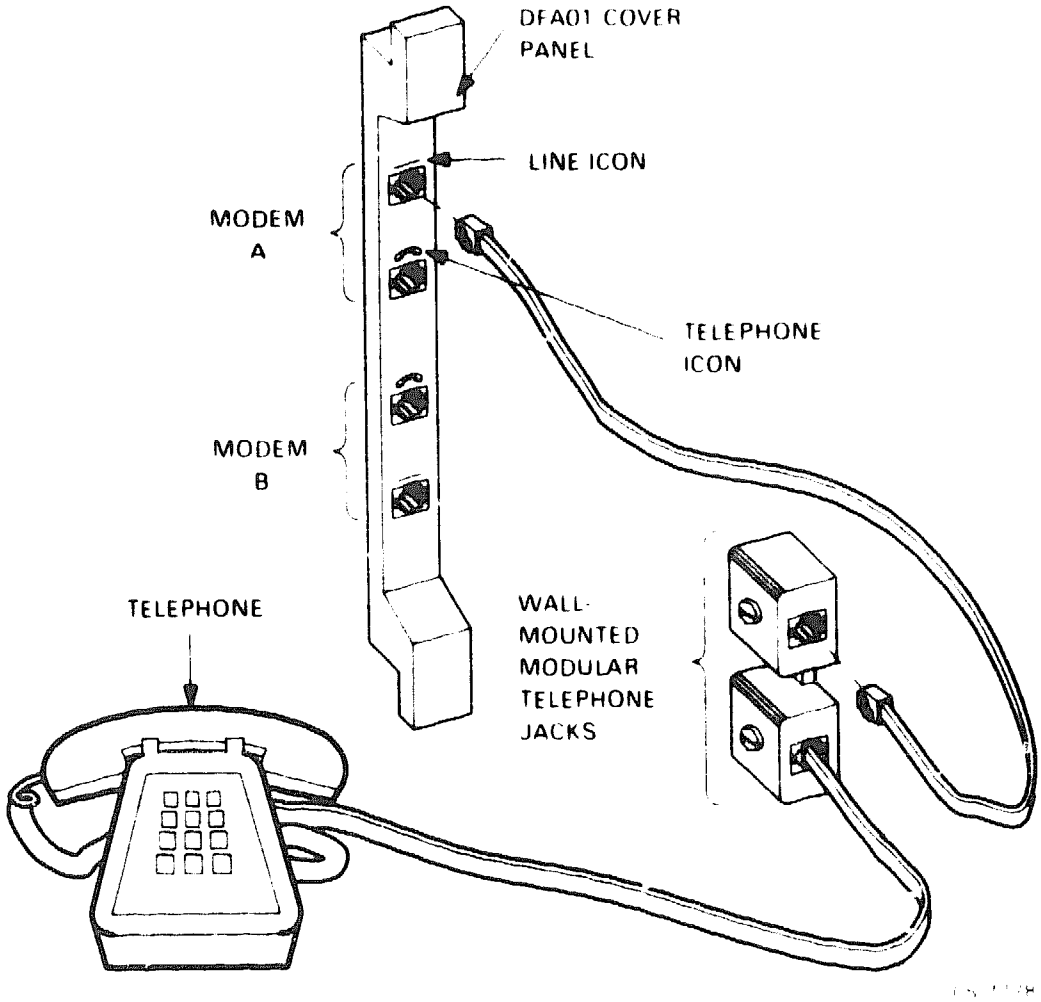
   If you require voice communication on modem B, refer to step 4 for more information.

4. If you require voice communication with the DFA01 modem, you may want to consider this step.

   You can install voice communication on the DFA01 modem in one of two ways. Depending on the location of the system, telephone, and wall-mounted modular telephone jacks, one of the following two methods of installing voice communication may be more appropriate for the system.

   The first way of installing voice communication is established for both modem A and modem B in the preceding steps. The telephone is connected to the wall-mounted modular telephone jack, which is, in turn, connected to the DFA01 cover panel (see Figure 17).

Figure 17: Connecting Modem to Wall-Mounted Jack (Data Jack Service)—Telephone-to-Wall-Jack Connection



The following describes an alternative method of installing voice communication on the DFA01 modem. The telephone is connected to the DFA01 cover panel which is, in turn, connected to the wall-mounted modular telephone jack (see Figure 18).

1. Leave the eight-wire telephone cord that attaches the DFA01 cover panel to a wall-mounted modular telephone jack connected.
2. Disconnect the telephone line from the wall-mounted modular telephone jack. Leave the telephone line connected to the telephone.
3. Connect the telephone line from the telephone to the DFA01 cover panel. To install voice communication on modem A, plug the telephone line into the first jack on the DFA01 cover panel marked with the telephone icon. To install voice communication on modem B, plug the telephone line into the second jack on the DFA01 panel marked with the telephone icon, as shown in Figure 15.

Setting Up Terminal Lines

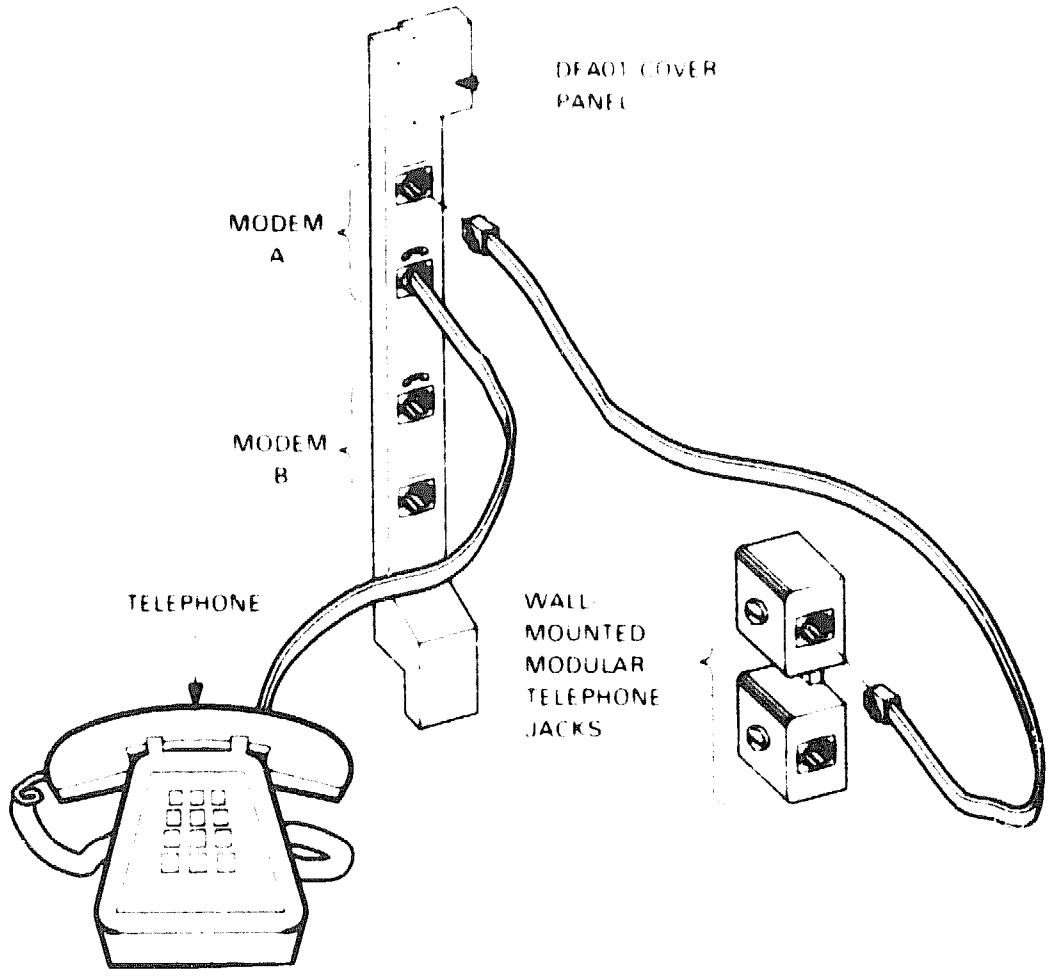
Before you can use the DFA01 modem, you must set up the operating system software to recognize the DFA01 modem.

Set up the operating system software to support the following four terminal lines for the DFA01 modem:

- Modem A—primary channel
- Modem A—on-line control channel (OLC)
- Modem B—primary channel
- Modem B—on-line control channel (OLC)

Refer to the operating system documentation to determine how to make permanent terminal line definitions so that every time the system is powered up, the terminal lines are configured for proper operation.

Figure 18: Connecting Modem to Wall-Mounted Jack (Data Jack Service)—Telephone-to-DFA01 Connection



You may need to define the following terminal line characteristics.

- Modem control—to support full EIA modem control.
- Speed, parity, data bits—terminal lines should be set to 2400 baud, parity disabled, and 8 data bits to coincide with the modem power-up defaults.
- Dial up—to support dial-up operation, if supported.
- Hang up—to disable automatic hang up of the lines when logging out, or when completing a dialog with the modem using terminal emulation software. With automatic hang up disabled, you can modify the DFA01 modem operating parameters (from applications software or when using a terminal emulator). You can then exit the program without the DFA01 modem resetting these parameters to power-up default values.

9 CONNECT TO AN ETHERNET NETWORK

Ethernet can be connected directly to the CPU (3400 only) or to a separate Ethernet controller, such as a DESQA module.

9.1 Connecting an Ethernet Network to the CPU Panel

The MicroVAX CPU module (3400 only) contains an Ethernet controller. Using either standard or ThinWire Ethernet cabling, you can connect your system to a network by way of the CPU module cover panel. The CPU cover panel contains connectors for both types of cabling. There is also a switch that controls selection of either the standard or ThinWire connector.

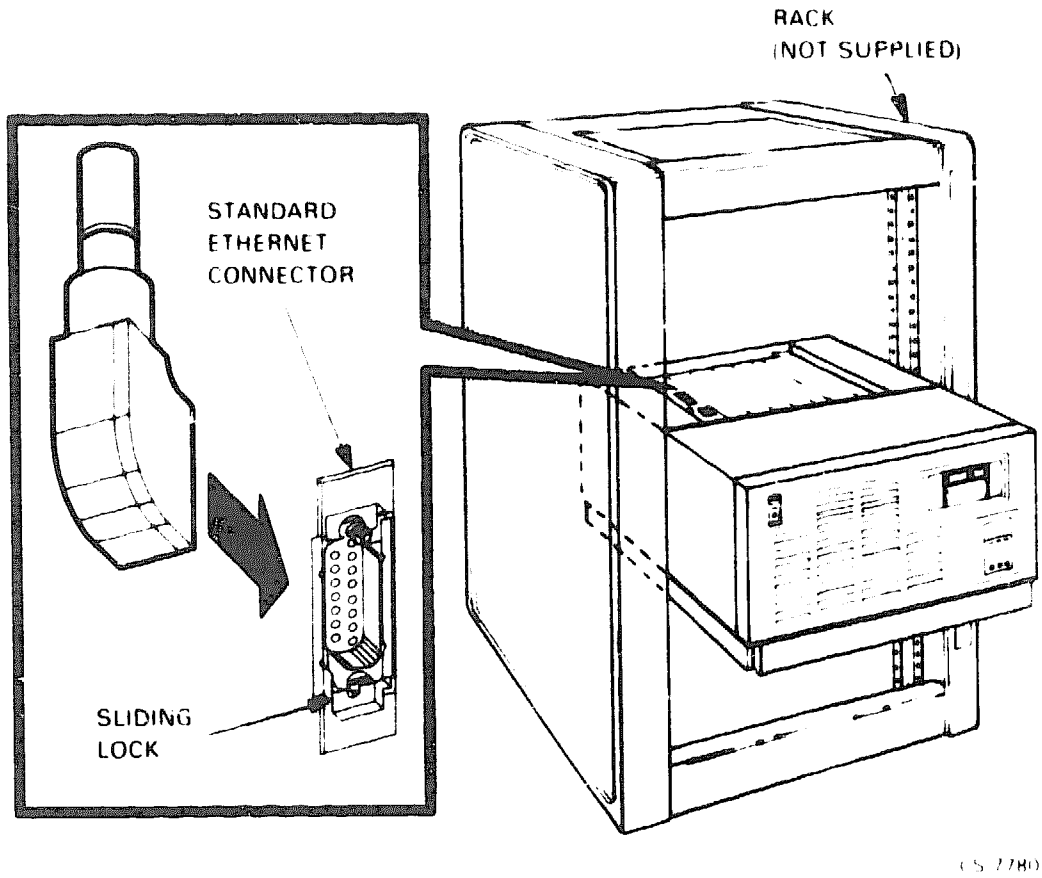
To activate power to the standard Ethernet connector, slide the switch to the up position. To activate power to the ThinWire connector, slide the switch to the down position. Depending on the position the switch is in, the light next to the connector should be lit, indicating an active connection.

Make a standard network connection as follows:

1. Find the Ethernet transceiver cable in the cable carton. The cable has a male connector at one end and a female connector at the other end.
2. Feed the male connector from the back and plug it into the female connector on the CPU module cover panel. Slide down the locking device on the female connector to secure the connection. Figure 19 shows a standard Ethernet network connection.
3. Connect the other end of the cable to one of the following devices:
   - An H4000 transceiver located on a traditional baseband Ethernet cable.
   - A DELNI which can, in turn, be connected to a baseband Ethernet cable, and which can connect up to eight systems in a local area network.
   - A DESTA adapter, which allows you to connect that Ethernet transceiver cable to ThinWire Ethernet cabling.

Digital Network and Communications (NaC) publications explain the types of network configurations possible.

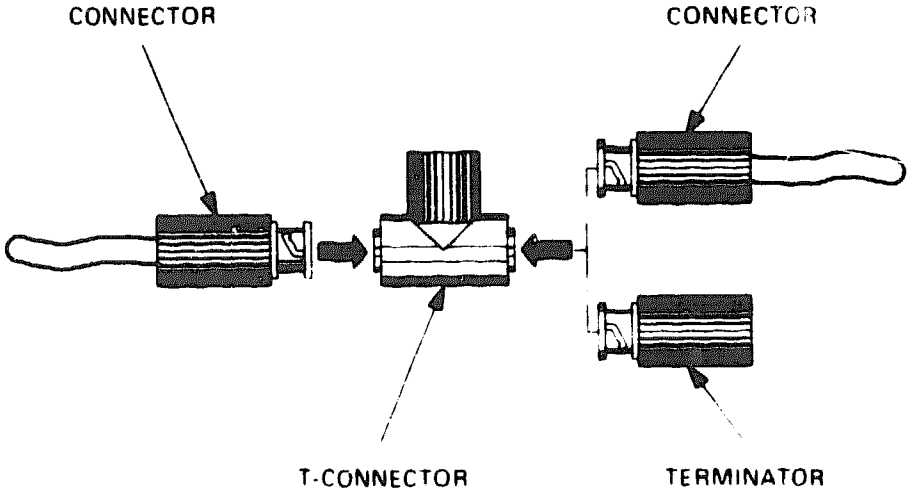
Figure 19: Making a Standard Ethernet Connection



Make a ThinWire network connection as follows:

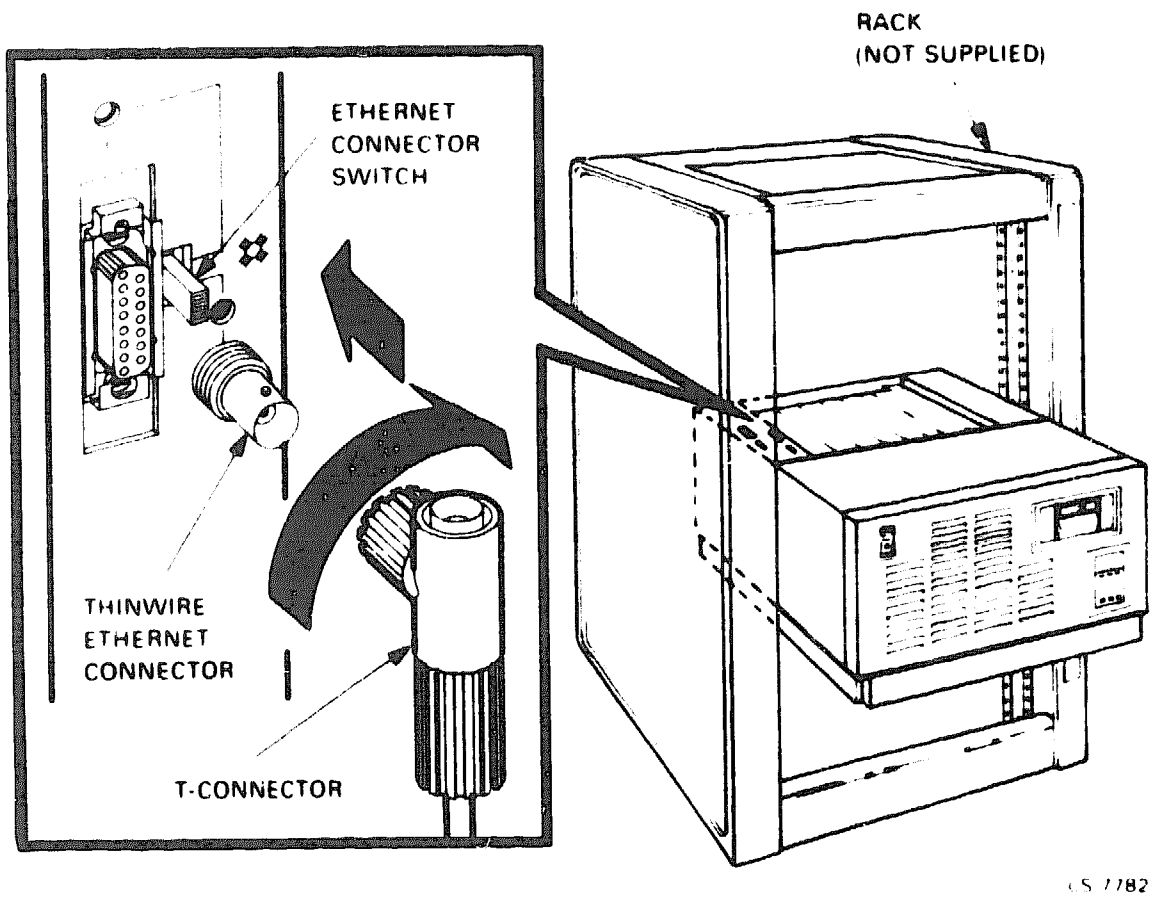
1. Find the T-connector, terminators, and cable clamp in the accessories carton. Figure 20 shows a ThinWire cable, T-connector, and terminator.

Figure 20: ThinWire Cable, T-Connector, and Terminator



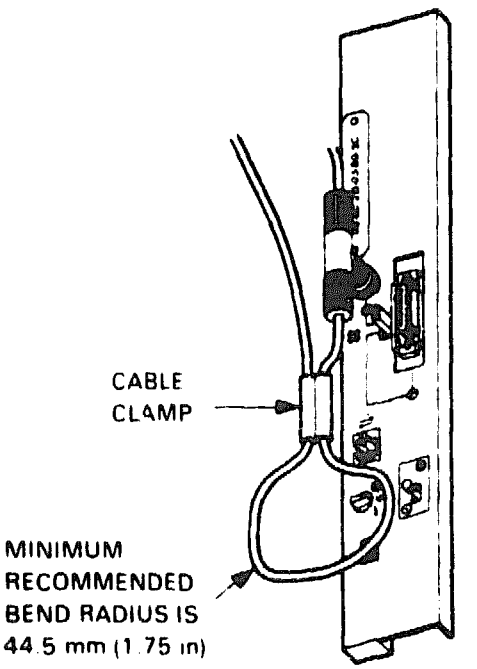
2. Plug the T-connector into the ThinWire connector on the CPU cover panel as shown in Figure 21. Turn the T-connector plug clockwise until it locks into place.
3. Connect the ThinWire Ethernet cable(s) to the T-connector as shown in Figure 21.
   - If the system requires one connection to the network, connect the ThinWire cable to the lower end of the T-connector and a terminator to the other end of the T-connector. Make connections to the T-connector by turning the connector or terminator clockwise until it locks into place.
   - If the system is a link to the network and connects to two additional components, connect one ThinWire cable to one end of the T-connector and connect a second ThinWire cable to the other end. Connect the cables to the T-connector by turning the connectors clockwise until they lock into place.

Figure 21: Making a ThinWire Ethernet Connection



Use the cable clamp from the accessories kit to form the upper cable in a loop approximately 10 cm (4 in) in diameter, as shown in Figure 22.

Figure 22: Form the Upper Cable in a Loop



CS-7783

The ThinWire cable can be connected to any one of the following devices:

- A ThinWire Ethernet Multiport Repeater (DEMPR) which can, in turn, be connected to a baseband Ethernet cable and which can connect up to eight ThinWire segments in a local area network.
- A ThinWire Ethernet Singleport Repeater (DESPR) which can, in turn, be connected to a baseband Ethernet cable, and connects to one ThinWire segment.
- A ThinWire Ethernet Controller located in another MicroVAX or workstation.

Digital Network and Communications (NaC) publications explain the types of network configurations possible.

Each ThinWire Ethernet segment must have one, and only one, grounding point. When the ThinWire cable is connected to a DEMPR or DESPR, the ground is provided by the DEMPR or DESPR chassis. If you are using a single-segment ThinWire Ethernet work area with no DEMPR or DESPR, you may need to ground the ThinWire connector on the CPU cover panel.

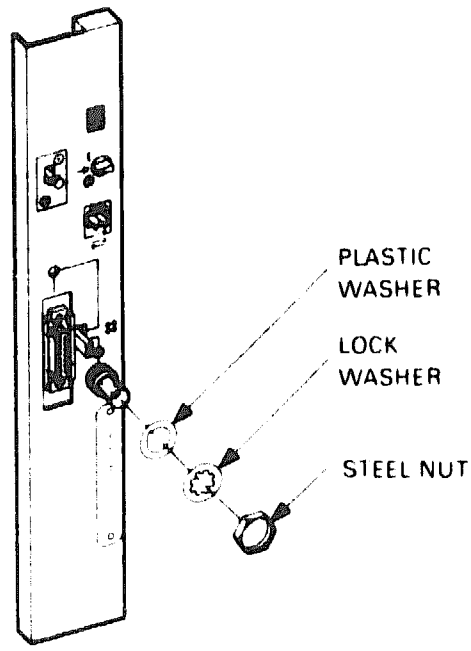
Note

Contact your network manager or Digital service representative if you have questions about network configurations.

To ground a single-segment ThinWire network at the CPU cover panel, follow the instructions below:

1. Remove the steel nut, the lock washer, and the plastic washer on the CPU cover panel, as shown in Figure 23.
2. Discard the plastic washer.
3. Replace and tighten the lock washer and steel nut.

Figure 23: Grounding ThinWire Ethernet at the CPU Cover Panel



9.2 Connecting to DESQA Ethernet Controller Module

You can connect your system to a network if your system has a DELQA module and if the Ethernet cabling is in place. Make the connection as follows:

1. Find the Ethernet transceiver cable in the cable carton. The cable has a male connector at one end and a female connector at the other end.
2. Connect the male connector to the female connector on the DELQA panel. Slide up the locking device on the female connector to secure the connection.
3. Connect the other end of the cable to one of the following devices:
   - H4000 transceiver located on a traditional baseband Ethernet cable.
   - DELNI which can, in turn, be connected to a baseband Ethernet cable, or to up to eight systems in a local area network.
   - DESTA converter, if you need to connect to a ThinWire network.

Digital Network and Communications (NaC) publications explain types of network connections possible.

10 CONNECT THE SYSTEM POWER CABLE

Do not proceed unless you have verified that the system's power requirements match the power source. The correct voltage for the system is listed on the serial number label next to the left power supply.

If the voltage listed matches the power source, continue with the installation. If the voltage does not match the power source, *do not* continue. Contact your Digital sales representative.

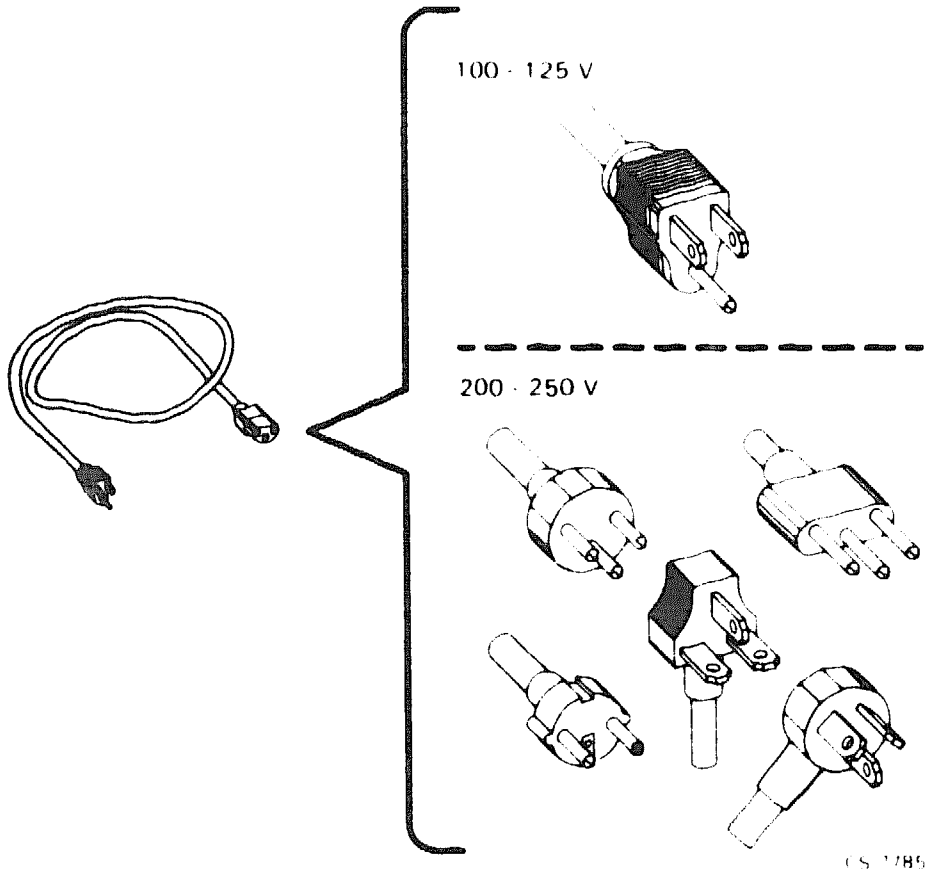
CAUTION

Operating a system with incorrect voltage can damage the system.

Connect the power cable to the system as follows:

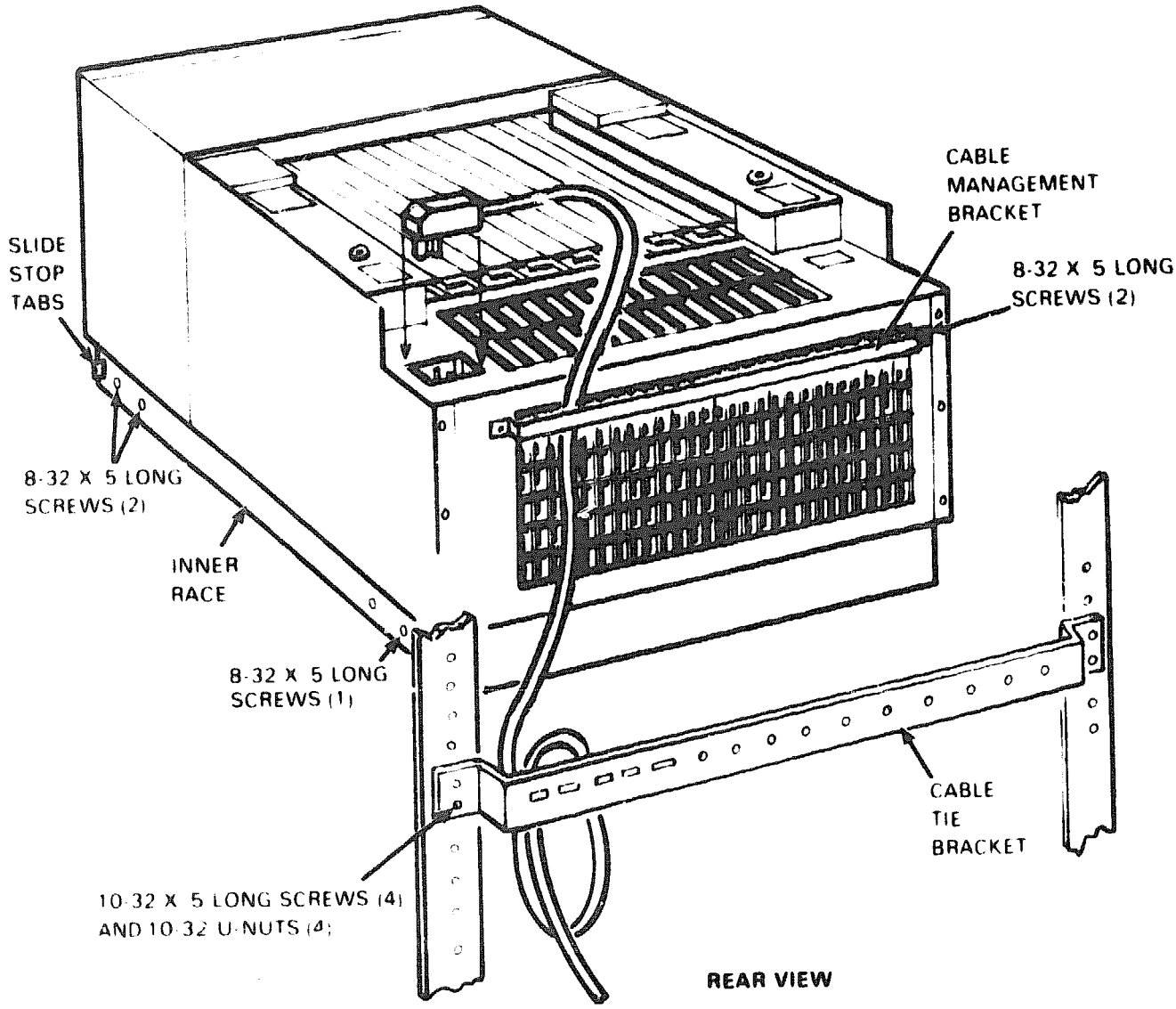
1. Make sure the system on/off (1/0) switch is set to off (0), and that all devices connected to the system are turned off.
2. Find the power cable packed inside the system shipping carton.
3. Make sure the pronged end of the power cable plug matches the wall outlet. Several types are shown in Figure 24.

Figure 24: Power Cords



4. **Feed the opposite end of the cable over the system from the rear or the left and attach it, as shown in Figure 25.**
5. **Plug the pronged end of the power cable into the wall outlet.**
6. **Secure cable to cable management bracket.**

Figure 25: Attaching Power Cord to the System



11 TURN ON THE SYSTEM AND SELECT A LANGUAGE

You are now ready to turn on the system and select a language. The language you select controls only the language of the console program, which is a part of MicroVAX firmware contained in the CPU. MicroVAX firmware enables you to give commands to the system and also generates error messages. CPU firmware is described in *MicroVAX VAXserver Technical Information*, which is included in this documentation kit.

Turn on the system and select a language as follows:

1. Turn on the console terminal and wait until it has performed its self-tests successfully.
2. Turn on the system by setting the power switch to on (1). The switch should glow orange.
3. Within a few moments, the Language Selection Menu should display on the console terminal, as shown in Figure 26.

Figure 26: Language Selection Menu

```
KA640-A T3.4-2 VMB 2.3

 1) Dansk
 2) Deutsch (Deutschland/Osterreich)
 3) Deutsch (Schweiz)
 4) English (United Kingdom)
 5) English (United States/Canada)
 6) Español
 7) Français (Canada)
 8) Français (France/Belgique)
 9) Français (Suisse)
10) Italiano
11) Nederlands
12) Norsk
13) Portuguès
14) Suomi
15) Svenska
 (1..15):
```

(S '78)

4. Select a language by typing the number corresponding to the choice and pressing Return.

Note

Some older terminals do not support multiple languages. The language selection menu does not appear and the system defaults to English.

After you select a language, the system runs power-on self-tests. Within a few moments, the console terminal should display a series of numbers as the system tests itself. The example in Figure 27 shows the screen after a successful power-on test.

Figure 27: Example of a Successful Power-On

```
KA640-A T3.4-2, VMB 2.3

Performing normal system tests.
41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..26..
25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..10..
09..08..07..06..05..04..03..
Tests completed.
Loading system software.
No default boot device is set.

Devices:
--DIA0 (RF30)
--MUA0 (TK70)
--ESA0 (08--00--2B----08--E7--A4)
--DEVICE? [ESA0]:
```

If the self-tests do not start or complete successfully as shown in the example in Figure 27, the system may have a problem. Refer to *MicroVAX Troubleshooting and Diagnostics* (included in this documentation kit) for instructions.

If the self-tests run successfully, turn the Power-Up Mode switch to the Run Mode, indicated by an arrow. This saves the language you selected.

12 AFTER INSTALLATION

You should now read the *BA212 Rackmount 3400/3800 System Operation Manual* to learn how to use the system. You must know how to operate the system controls and the tape drive before you install system software or run diagnostic software. Both system software and diagnostic software are shipped on tape cartridges.

While optional, Digital strongly recommends that you run the diagnostic software supplied with the system before you install system software. The diagnostics verify the system's configuration and check to see if each device is working properly. The diagnostic software is on a tape cartridge. Chapter 3 of *MicroVAX Troubleshooting and Diagnostics* describes how to run the diagnostic software.

Refer now to instructions on operating the tape drive in the *BA212 Rackmount 3400/3800 System Operation Manual*.


BA212
OPERATION

BA212
Rackmount 3400/3800 System

Operation

Order Number: EK–MVX3R–OM–001

Prepared by
Computer Special Systems

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Preface

This manual describes how to use the BA212 Rackmount 3400/3800 Systems. The hardware and software for each of these systems differ slightly, according to the function of the system: single user or multi-user.

The single-user system uses the VMS operating system and functions as an full-function node on an DECnet network node.

The multi-user system uses the VMS operating system and functions as an end- or full-function node on an Ethernet network.

The manual is structured as follows:

- Chapter 1 provides an overview of the systems.
- Chapter 2 describes how to use each system.
- Chapter 3 describes how to use options installed in the systems.
- The appendix lists related documentation.
- A glossary explains key terms.

Note

VAXserver systems are designed to offer maximum performance for applications that do not require timesharing. Some of the devices referred to in this manual are designed for multiuser systems and may not be suitable for a VAXserver system. Contact your Digital representative if you have any questions about whether use of a specific device is appropriate for your VAXserver system.

Conventions

The following conventions are used in this book:

Convention	Meaning
Key	A symbol denoting a terminal key used in text and examples in this book. For example, Break indicates that you press the Break key on your terminal keypad. Return indicates that you press the Return key on your terminal keypad.
Ctrl/C	A symbol indicating that you hold down the Ctrl key while you press the C key.
Bold	Bold type is used to indicate user input. For example: **>>>BOOT MUA0** This line shows that the user must type BOOT MUA0 at the ">>>" prompt.

Notes, Cautions, and Warnings

Throughout this manual Notes, Cautions, and Warnings have the meaning found in Table 1:

Table 1: Notes, Cautions, and Warnings

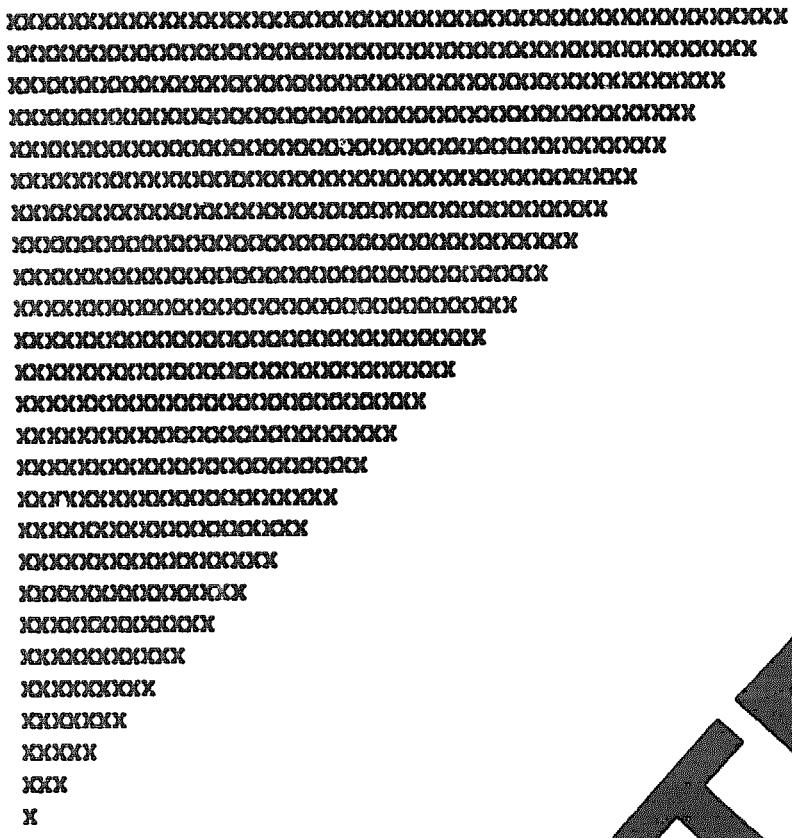
Note	A note calls the reader's attention to any item of information that may be of special importance to the reader.
CAUTION	A caution contains information essential to avoid damage to the system.
WARNING	A warning contains information essential to the safety of personnel.

FCC USER STATEMENT

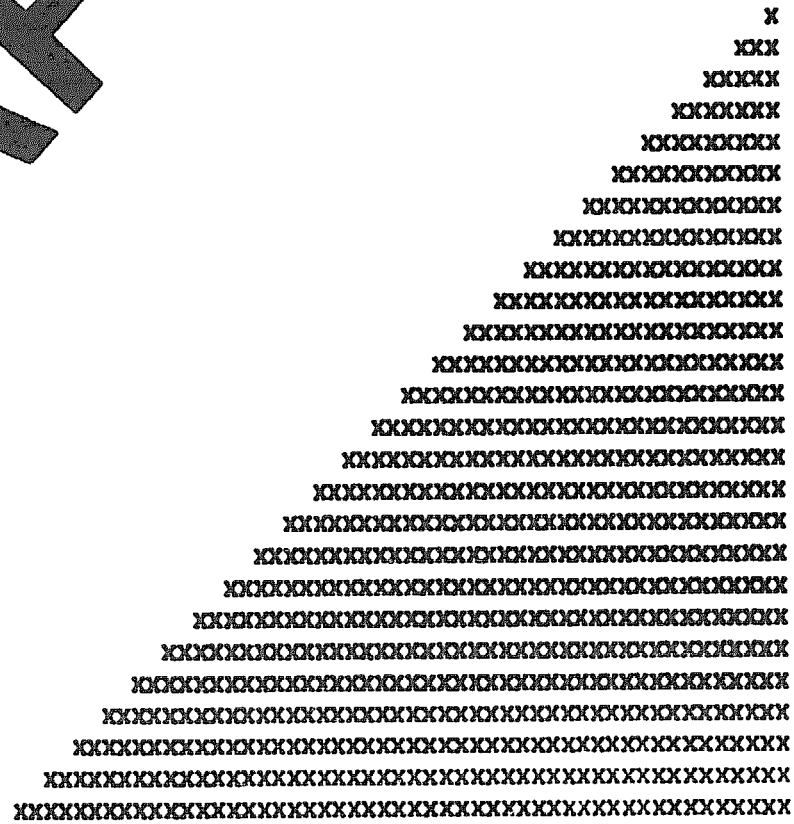
NOTICE

This equipment generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such radio frequency interference. Operation of this equipment in a residential area may cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Use of the shielded MMJ cable (17-01364-02) is required to meet FCC compliance.



CHAPTER 1



Chapter 1

System Overview

This introductory section describes the BA212 Rackmount 3400/3800 System.

BA212 Rackmount 3400/3800 Systems contain all system components in a rackmounted enclosure. The enclosure houses the following:

- Central processing unit (CPU)
- Memory modules
- Communications controllers
- Mass storage controllers
- RF30/RF71 fixed disk drive
- TK50/TK70 tape drive
- Power supplies

Depending on the configuration you ordered, up to three RF30 or three RF71 disk drives may be mounted inside the enclosure.

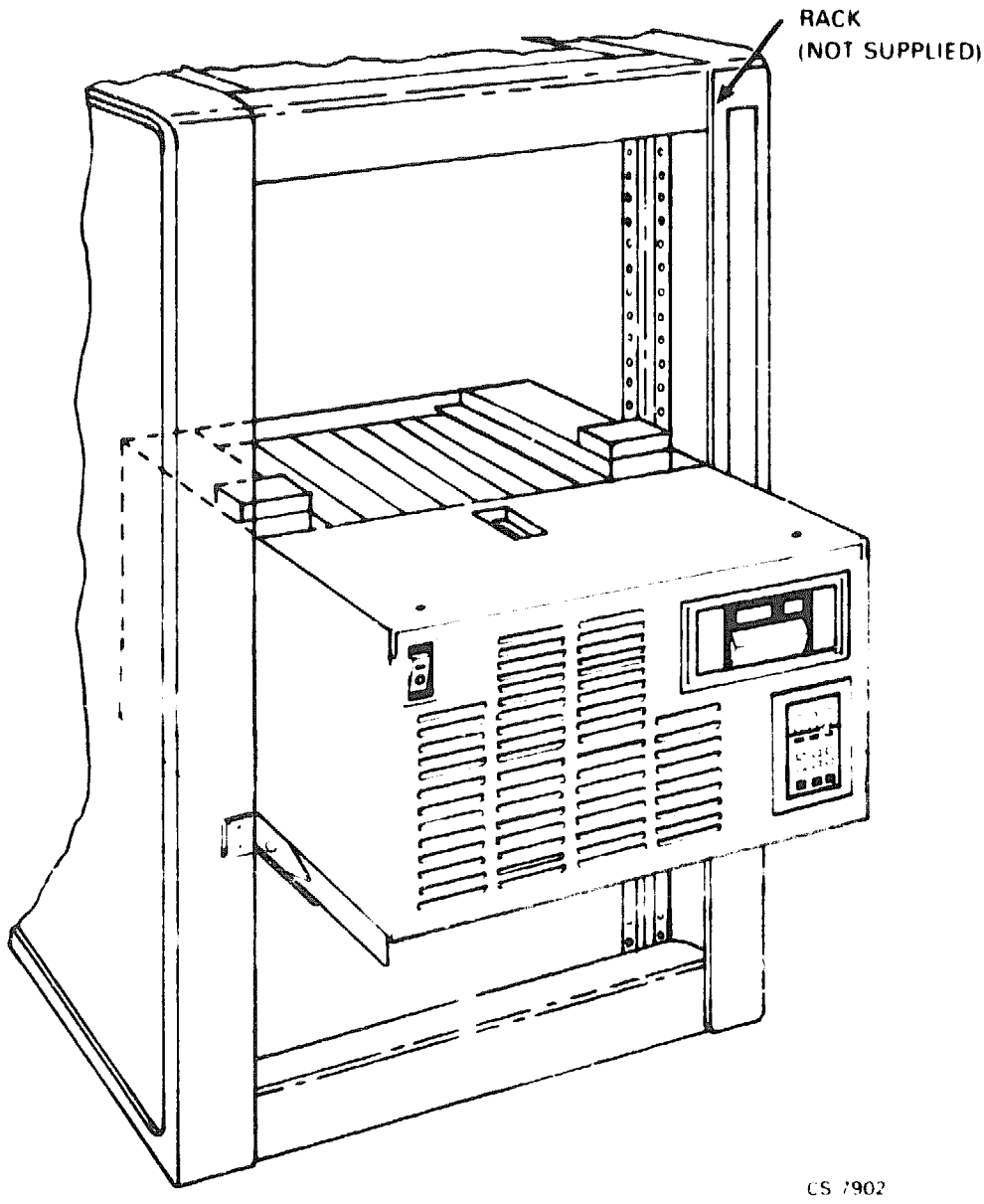
This chapter describes the system components and their functions. The front of the system has a removable front panel that restricts access to some of the system components. The front panel, the enclosure behind the panel, and the function of the system components are described in turn.

Chapters 2 and 3 describe how to use the system and options.

1.1 Front View of the BA212 Rackmount 3400/3800 System

Figure 1–1 shows a BA212 Rackmount 3400/3800 System with the front panel attached.

Figure 1–1: BA212 Rackmount 3400/3800 System Enclosure



The next section describes the enclosure.

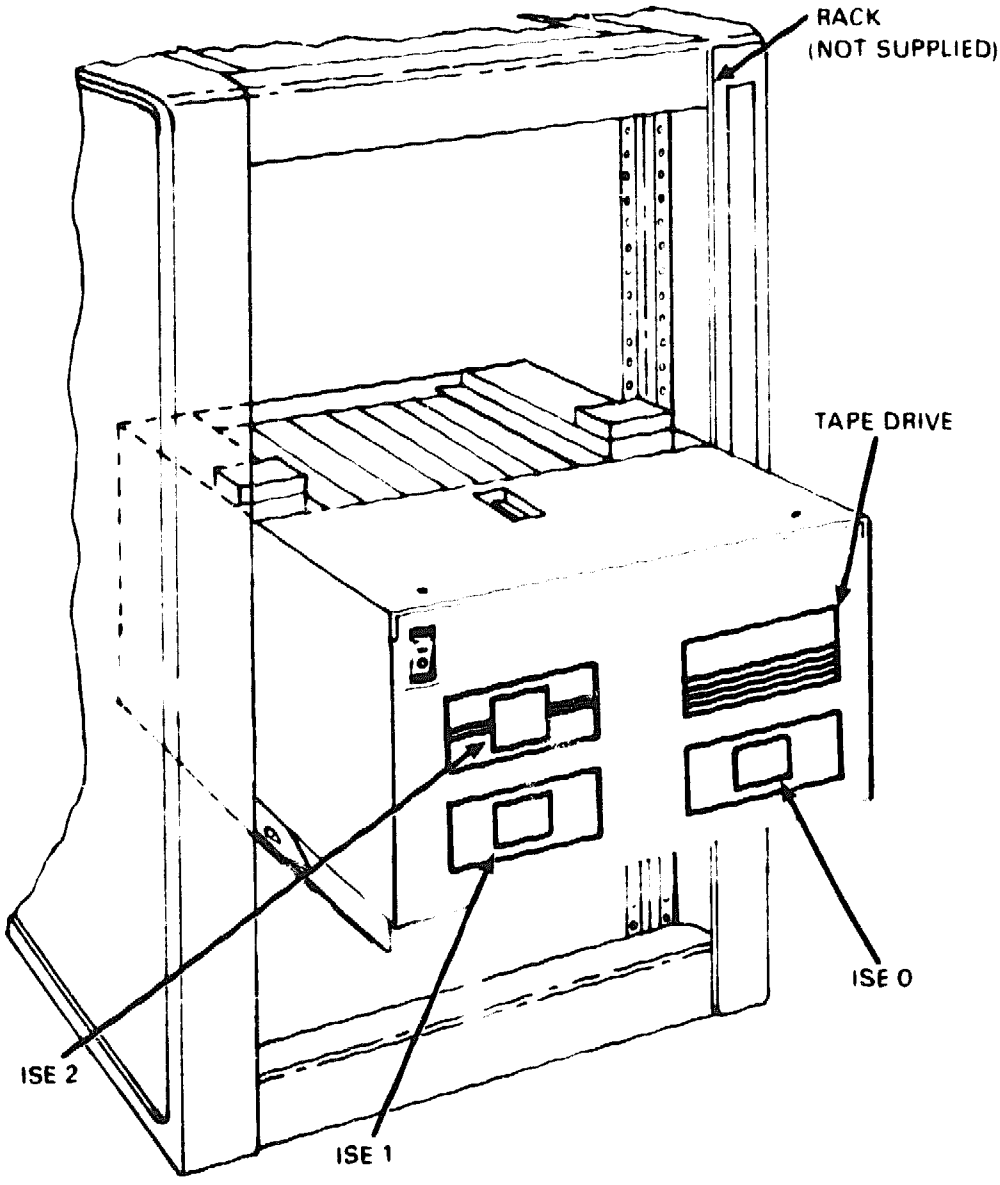
1.1.1 Enclosure

Figure 1–2 shows a typical configuration.

The enclosure contains the following:

- Mass storage—RF30 or RF71 Integrated Storage Elements (ISE) and a TK50/TK70 tape drive
- Card cage containing modules—CPU, memory, communications controllers, mass storage controllers
- Power supplies (2)
- Fans (2)
- Slides (2)
- Operator Control Panel (OCP)

Figure 1–2: Top View of the Enclosure



NOTE: FRONT COVER AND OCP REMOVED FOR CLARITY

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1.1.1.1 Mass Storage Area

The mass storage area is in front of the enclosure. The area contains a TK50/TK70 tape drive and up to three RF30/RF71 Integrated Storage Elements (ISE). The drives are behind the bezel and orifice plates shown in Figure 1–3.

The Operator Control Panel (OCP) has several buttons and indicators for each drive. When you turn on the system, indicator lights illuminate for each drive present. Chapter 3 describes how to use the control panel.

At the bottom of the OCP is the system DC OK light. When lit, the green DC OK light indicates that the voltages are within the correct operating range. When unlit, there is a problem with one of the power supplies. If the DC OK light is not lit, contact your Digital service representative.

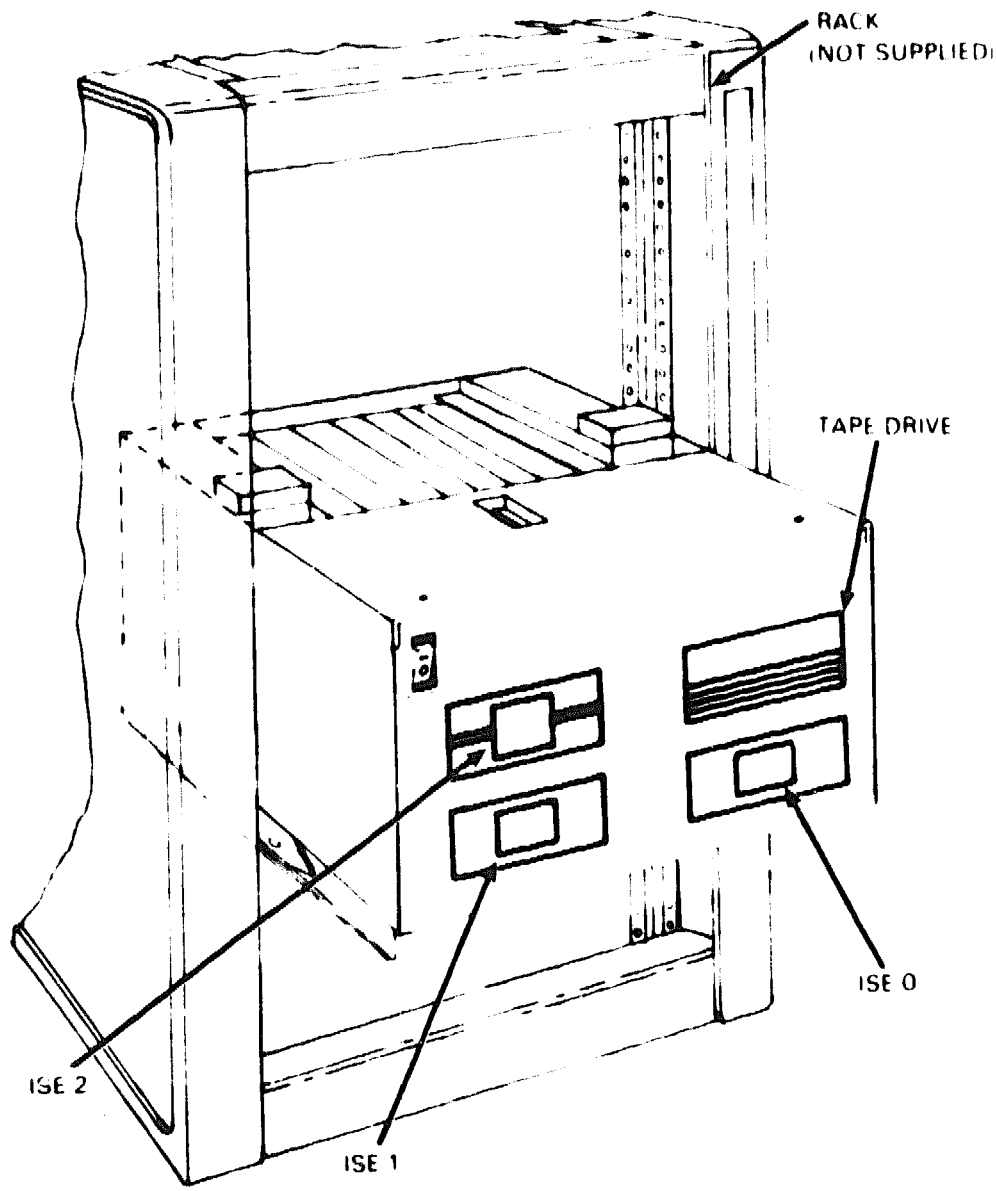
To the left of the DC OK light is the Halt button. The Halt button is a two-position button. When you press in the button, the system halts and the console mode prompt >>> appears on the console terminal screen. Before you can enter console commands, press the Halt button again to return it to the out position. Now you can enter console commands. If you inadvertently press the Halt button, type Return to continue.

CAUTION

Pressing in the Halt button halts the system regardless of the setting of the Break Enable/Disable switch on the CPU cover panel.

To the left of the Halt button is the Restart button. When you press the Restart button, the system reboots system software.

Figure 1–3: Mass Storage Area



NOTE FRONT COVER AND OCP REMOVED FOR CLARITY

1.1.1.2 Card Cage

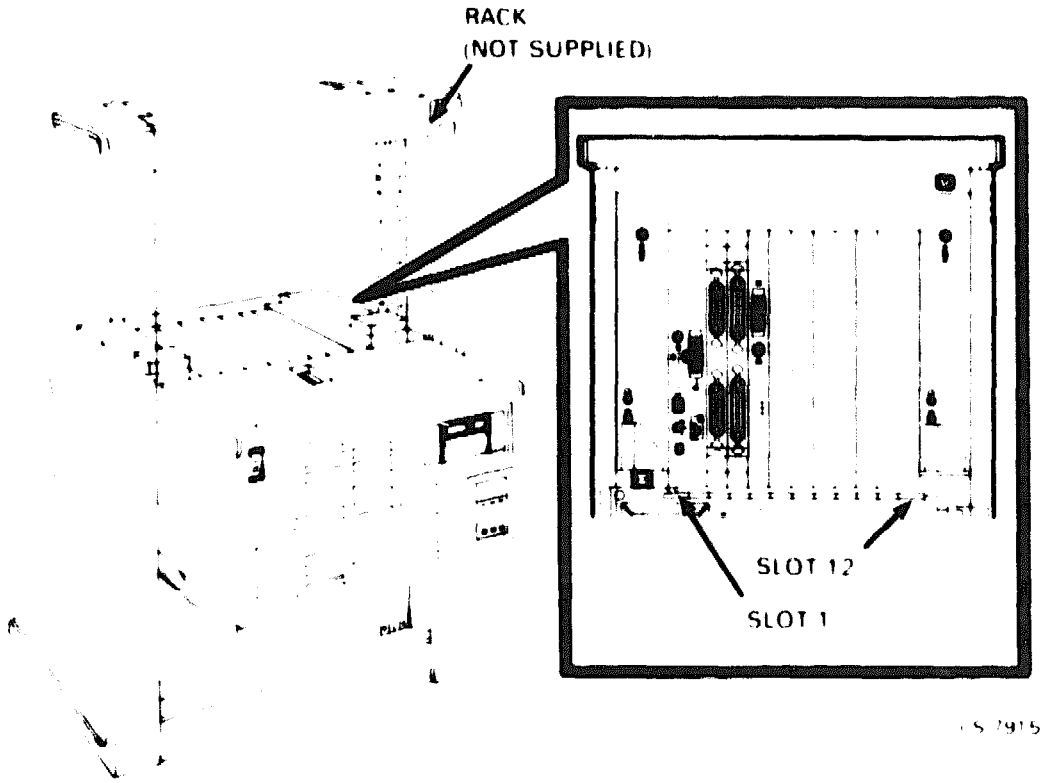
CAUTION

Do not operate the system without Digital-supplied module cover panels. The cover panels are required to protect the equipment, to meet international regulatory standards, and for proper cooling. Do not substitute other cover panels as they may not meet the required specifications.

The modules in your system are mounted in a 12-slot card cage behind the mass storage area. The slots are numbered 1 to 12 from right to left, as shown in Figure 1–4.

The number and type of modules installed in your system depend on your configuration. Each slot, even an empty one, is protected by a cover panel. Together the panels form a shield with a three-fold purpose: to protect external devices from electrical interference generated by the system; to protect the system from electrical interference generated by external devices; to properly cool the modules.

Figure 1–4: Card Cage (12-Slot)



Operating the system without the module cover panels has the following consequences:

- The system may overheat due to improper air circulation.
- The system will not comply with FCC and VDE requirements for shielding and may produce electrical interference that affects other equipment.
- The system is susceptible to electrical interference or damage from external sources.

The design of the cover panels varies, depending on the type of module installed in the slot. Modules requiring external cable connections, such as communications controllers (excluding Ethernet cable connections), have recessed cover panels that are riveted directly to the module. The recessed panels allow space for connecting cables. Modules requiring no external cable connections, such as mass storage controllers, are covered by flush cover panels. Empty slots are also covered by flush cover panels, which may be single or double width.

All cover panels, except those covering empty slots, have a label identifying the module installed in the slot.

Cables connecting your system to peripheral devices (such as terminals, modems, and printers) are attached to communications controllers. Each cable can contain multiple lines. The cables run to the rear of the enclosure and out the back of the enclosure, where the cables are split into individual lines. Chapter 3 describes these connections in more detail.

The central processing unit (CPU) module is installed in slot 1 with its associated memory module in slot 2. Additional memory modules may be installed in slots 3 through 5. The CPU and the first memory module are behind a double-width cover panel that has internal cable connections to the CPU module. Figure 1–5 shows the 3400 system CPU cover panel. Figure 1–6 shows the 3800 system CPU cover panel.

CPU Cover Panel Components

The CPU cover panel has the following components:

- Break Enable/Disable Switch—When the switch is in the disabled position (dot outside the circle), breaks are disabled. When the switch is in the enabled position (dot inside the circle), breaks are enabled. When breaks are enabled, pressing BREAK on the console terminal halts the processor and transfers control to the console program. When you change the switch from one setting to the other, you must activate the new setting by resetting the system. To reset the system, press the Reset button on a power supply.

- Power-Up Mode Switch—This 3-position rotary switch determines how the system responds at power-up:

  Language Inquiry Mode (indicated by a human profile) causes the system to display a language selection menu at power-up if your console terminal supports multiple languages. Also, if a default boot device has not been selected, this mode causes the system to issue a list of bootable devices and prompts you to select a device from the list. Once a device is selected, the system autoboots from that device each time you turn it on.

Run Mode (indicated by an arrow) is the normal operating setting.

Loop Back Test Mode (indicated by a T in a circle) causes the system to run loopback tests on the console serial line at power-up. This setting requires special loopback connectors and is for Digital field service use only.

Figure 1–5: 3400 System CPU Cover Panel

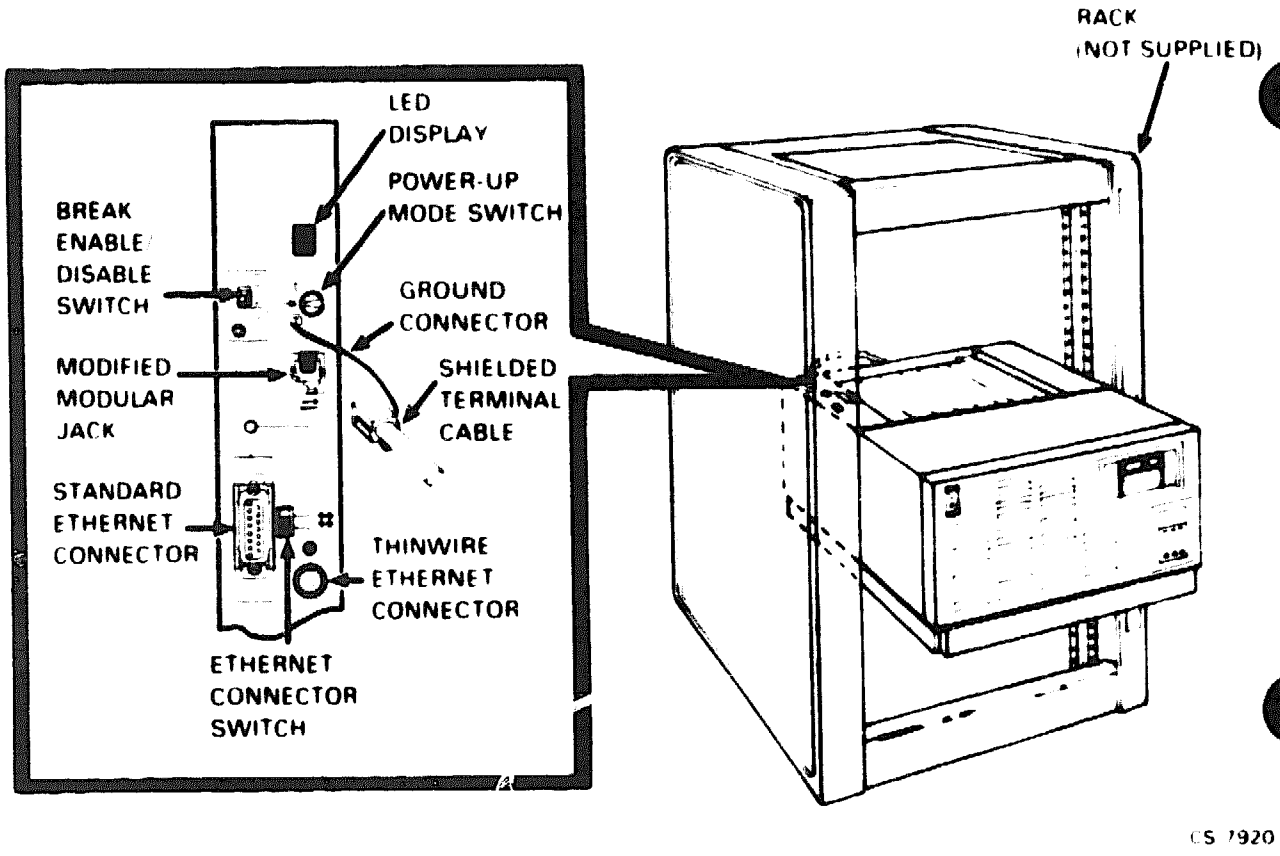
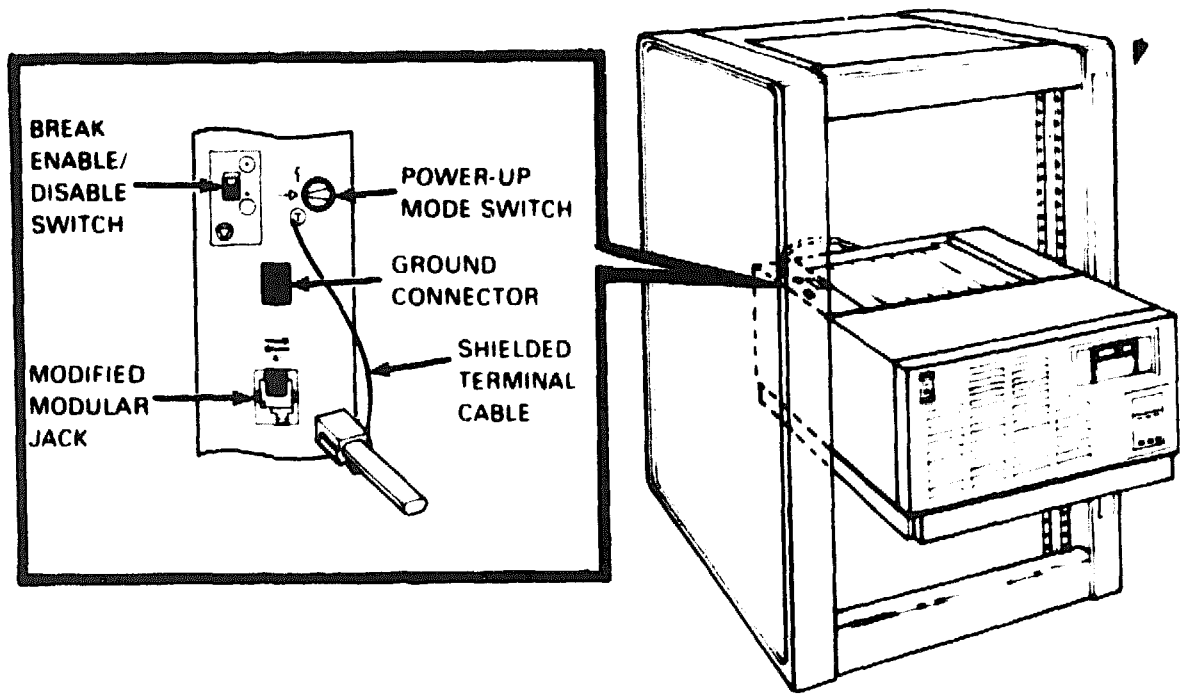


Figure 1–6: 3800 System CPU Cover Panel



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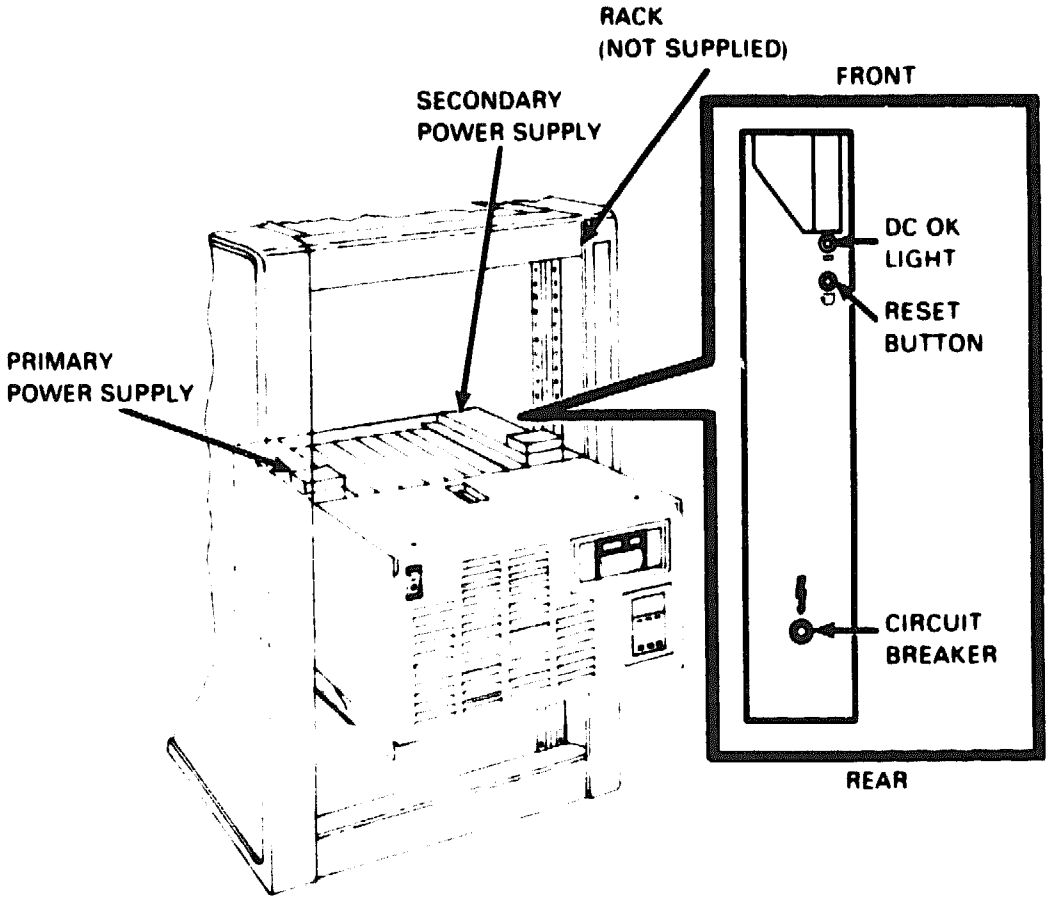
- **The light-emitting diode (LED) display shows the testing sequence during power-up.**
- **Console terminal connector—This modified modular jack (MMJ), labeled A–1, provides the connection for the console terminal.**
- **Ethernet connectors (3400 system only)—The cover panel has two Ethernet connectors: a BNC-type for ThinWire Ethernet; a 15-pin connector for a standard Ethernet transceiver cable. The Ethernet connector switch allows you to set the type of connection. To use the transceiver cable connection, set the switch to the up position. To use the ThinWire cable connection, set the switch to the down**

position. A green indicator light (LED) for each connector indicates which connection is active.

1.1.1.3 Power Supplies

The system has two power supplies. The one on the left is the primary power supply; the one on the right is the secondary power supply. Figure 1–7 shows the controls and indicators on each power supply.

Figure 1–7: Power Supply



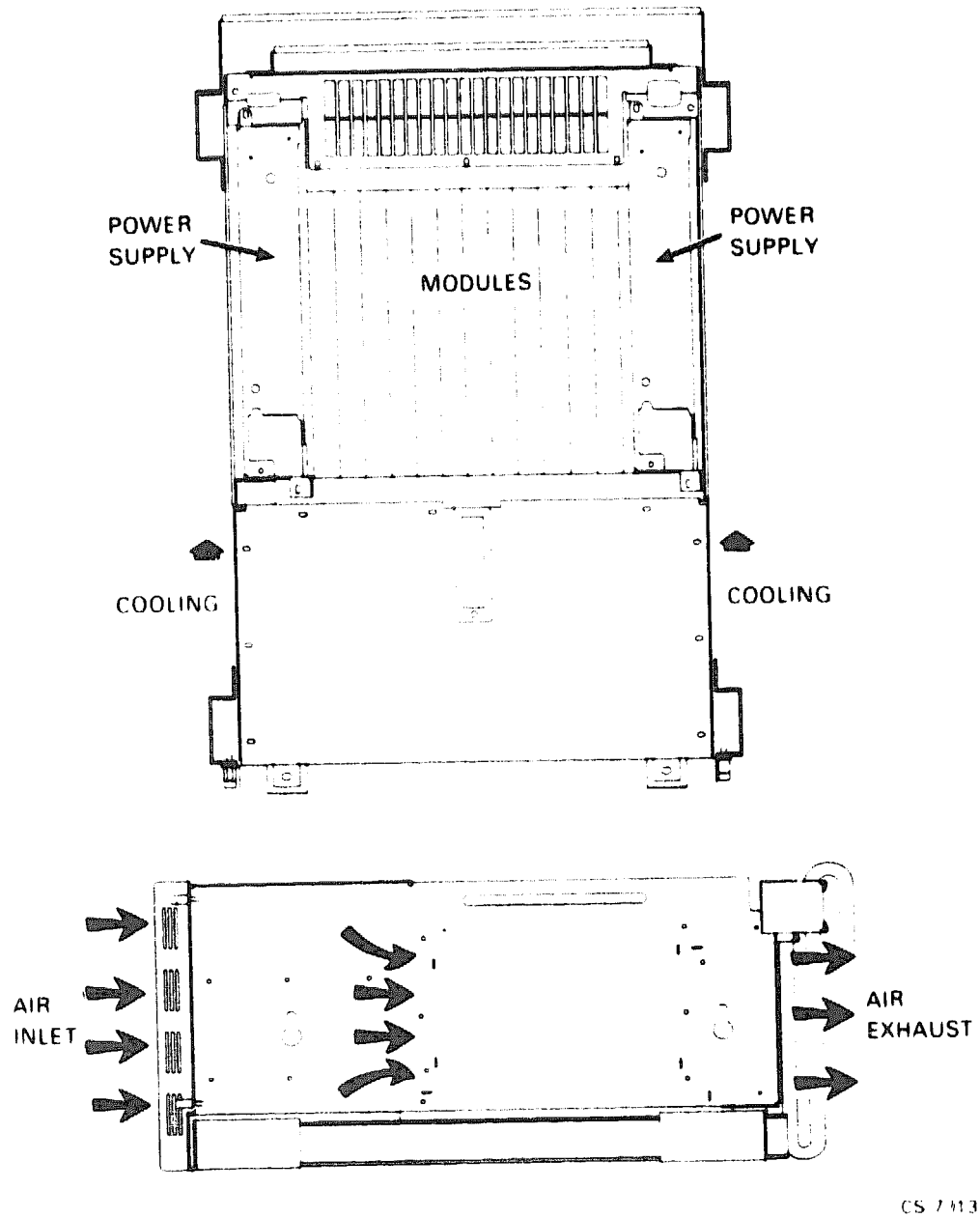
The controls and indicator lights function as follows:

- DC OK—When the DC OK light is lit, the voltages are within the correct operating range. An unlit DC OK light indicates a problem with the power supply. Turn off the system and call your Digital service representative.
- Reset button—A recessed Reset button enables you to reset the system to a power-on state without turning it off. The Reset button is recessed to prevent the system from being inadvertently reset. Use your fingertip or a small tool to press the button. See Chapter 2 for the correct procedures for resetting the system.
- Circuit breaker—The circuit breaker trips to protect the system from power surges. When tripped, the circuit breaker is in the out position. To reset the breaker, press the circuit breaker to the in position.

1.1.1.4 Fans

Two fans located in the rear of the chassis draw air through the enclosure. The fans draw air from the front of the enclosure, through the card cage and out the back of the enclosure. The speed of the fans varies with the temperature. Figure 1–8 shows the air flow through the system enclosure.

Figure 1–8: System Air Circulation



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1.1.2 Mass Storage Options

Each system can have a TK50/TK70 tape drive and up to three ISEs (RF30/RF71) mounted in the enclosure.

Instructions for using each of these devices are in Chapter 3.

1.2 Functional Description of Base System

Each system includes base system components common to all systems and, perhaps, optional components. Your system is configured at the factory based on your order.

The following sections describe base system components and options.

1.2.1 Base System Components

Base system components include the following:

- Central processing unit (CPU)
- Console serial line unit (SLU)
- Main memory
- Mass storage devices and controllers
- Power supplies
- Fans
- OCP

1.2.1.1 Central Processing Unit (CPU)

The central processing unit (CPU) controls the execution of all instructions and processes. The CPU circuits contain the logic, arithmetic, and control functions used by the system.

1.2.1.2 Console Serial Line Unit (SLU)

Each system has a serial line unit (a line on which each bit of information is sent sequentially on a single channel) connecting the console terminal to the CPU module. The SLU connector (a shielded terminal cable) is located on the CPU cover panel. The console serial line provides a means of communicating with the CPU.

1.2.1.3 Main Memory

Main memory provides the physical storage area for data and instructions used by the CPU. When you start your system, the operating system is loaded into main memory. Application programs must also be loaded into memory.

When the system cannot load everything into memory at once, it reads in units of data called pages (512 bytes of data) from disk. Having a large main memory increases the efficiency of processing, since fewer pages must be copied to and from disk. Each configuration comes with a standard memory option that you can upgrade to increase efficiency.

The contents of memory are volatile. This means they are lost when you turn off power to the system. Use mass storage devices, such as fixed disks and tape cartridges to store software and data permanently.

1.2.1.4 Mass Storage Devices and Controllers

Mass storage devices record data on magnetic media. The data recorded is not lost when you turn off the system, but can be altered or erased if you record over the data. Use mass storage devices to store data and software permanently. When the data or software is needed, the CPU copies it from the mass storage device into main memory. The two primary types of mass storage devices are fixed disks and devices with removable media, such as tape cartridges.

ISEs

ISEs can be installed in your system. They provide large-capacity storage for software and data files, as well as rapid access to the data by the CPU. Your system may have multiple ISEs.

Devices with Removable Media

Devices with removable media, such as TK50 or TK70 tape cartridges are used as both input and output devices. You use them as input devices when you install software or copy data to your system. Tape cartridges are the primary media for loading software. You use these devices as output devices when you copy software or data from your system. You can copy individual files or programs, or you can copy (back up) the contents of an entire fixed disk. Tapes and disk packs are commonly used to archive data from systems.

Mass Storage Controllers

All mass storage devices require a controller, a device that controls activity between the CPU and the mass storage devices. The controller for each fixed disk drive is built-in to the drive. The CPU communicates to the drives through an adapter on the CPU module. The controller for the TK50/TK70 tape drive is installed to the left of other modules in the card cage.

1.2.1.5 Power Supplies

The system has two power supplies. The primary power supply provides power to modules installed in slots 1–6, one or two mass storage devices (ISE 1 and 2, if present), and the two fans. The second power supply provides power for modules in slots 7–12, fixed disk 0 (ISE 0) and tape drives.

1.2.1.6 Fans

Two fans located behind the card cage draw air into the enclosure. The fans draw air from the front of the enclosure, through the mass storage devices and card cage and out the back of the enclosure. To reduce the load on the fans, keep the system away from heat sources. The speed of the fans varies with temperature.

1.2.1.7 OCP

The OCP contains three switches and three LED indicators for each drive. Section 3.1describes how to use the OCP. The 10-conductor cable for each drive connects to the backplane by way of the drive. A 50-conductor cable from the CPU panel connects to each DSSI drive. This is a daisy chain connection.

1.2.2 Optional Components

System options can include multiples of components that are part of the base system (for example, additional memory modules or disk drives) and the following kinds of options:

- Communications controllers
- Real-time controllers
- Printer interfaces

1.2.2.1 Communications Controllers

Besides the console serial line, most systems have additional communications controllers for connecting additional terminals, and for communicating with other systems over telephone or network lines. Communications controllers provide standard interfaces between peripheral devices and the system. Many communications controllers provide support for multiple data lines.

The following types of communications controllers are available:

- Asynchronous serial controllers
- Synchronous serial controllers
- DECservers
- Network controllers

Serial controllers transmit data one character at a time. A device at the transmitting end breaks bytes of data into bits. A device at the receiving end assembles incoming bits into bytes of data.

Asynchronous Serial Controllers

Asynchronous serial controllers provide low-speed connections between peripheral devices and the system. Asynchronous communication between the system and the peripheral depends on recognition of a pattern of start and stop bits, not on a time interval.

Asynchronous serial controllers may be divided into those without modem support and those with modem support.

You use serial controllers without modem support to connect additional terminals and printers to your system. For example, the CXA16 module provides connections for up to 16 serial lines with no modem support.

Note

Printers equipped with a microprocessor (intelligent printers) may require modem control signals to function correctly. Do not attach a printer requiring modem control signals to a controller with no modem support. Check your printer documentation to determine the proper communications interface for your printer.

Communications controllers with modem support allow you to communicate over telephone lines. With a modem connected to your system, you can access other computers and you can dial into your system from a remote terminal or computer.

Computers transmit Digital signals, while telephone lines (with the exception of Digital leased lines) transmit analog signals. When two computers communicate over telephone lines, a modem is required at both the transmitting and receiving end of the line. At the transmitting end, the modem converts Digital signals from the computer (or terminal) to analog signals prior to transmission over telephone lines. At the receiving end, another modem converts the analog signals from the telephone line back into Digital signals the computer can understand.

The degree of modem support depends on the number of modem control signals recognized by the device. Full modem support (according to Digital standards) requires recognition of eleven signals. The CXY08 module supports up to eight serial lines with full modem support.

Synchronous Serial Controllers

Synchronous serial controllers provide high-speed connections between systems. Communication between synchronous devices depends on time intervals that are synchronized before transmission of data begins. Synchronous devices can also have modem support.

DECservers

DECservers are terminal servers (a combination of hardware and software) that allow you to connect multiple terminals or printers to hosts in an Ethernet Local Area Network (LAN).

Terminal servers perform the functions of traditional data terminal switches but multiplex the lines over the Ethernet. Using a DECserver offloads communications processing from the host system.

Network Controllers

Network communications controllers allow you to connect to an Ethernet local area network or other network types. With a network connection and appropriate DECnet software, you can use network services, such as mail; access data stored on other systems; perform operations, such as editing and printing on remote systems; and share resources, such as laser printers.

1.2.2.2 Real-Time Controllers

Real-time controllers interface devices that monitor processes, for example, laboratory equipment or manufacturing equipment connected to the system. Typically, real-time controllers are parallel devices, not serial devices. Parallel devices transmit more than one bit of information simultaneously.

1.2.2.3 Printer Interfaces

Some printers require specific interfaces to communicate with the system. For example, the LG01 and LG02 require the LPV11–SA interface.

1.2.2.4 Other Available Options

Your system arrives configured with the options you ordered. As your needs change, you can add more options. Your Digital sales representative can advise you on available options. The technical information section of the customer kit describes the options currently available. Digital provides installation for additional options that you order.

1.3 Dual-Host Capability (VMS Systems Only)

CAUTION

Before building a dual-host configuration, consult your Digital service representative and reference your system warranty. The terms of your warranty may be violated if you attempt to configure these systems yourself.

A Digital Small Storage Interconnect (DSSI) disk drive, such as the RF30 or the RF71, has a built-in multihost capability that allows it to connect to more than one DSSI host adapter. Since the DSSI adapter is located on the CPU module, two systems can be connected to the same DSSI bus.

Using an external DSSI cable, any two systems can be connected to form a dual-host configuration.

Note

Dual-host capability is only supported under VMS when the two systems are configured into the same VAXcluster.

The benefits of a configuration are:

- VAXcluster features such as shared data across systems and satellite nodes.
- Higher system availability—if one of the systems is unavailable, for example, due to software update or system malfunction, the satellites booted through it are able to continue operating through the other system. This process is described in more detail below.

The primary application for such a configuration is a VAXcluster system. The simplest dual-host configuration, for example, is to configure one system disk to be used as the system disk by both machines. The system disk physically resides in one enclosure, however, both systems have equal access to the disk and to any other DSSI mass storage device in either enclosure.

If one of the CPU modules fails, all satellite nodes booted through that module lose connections to the system disk. Each satellite node knows, however, that the system disk is also available through a second path—that of the remaining module. The satellite nodes establish a new connection through the other system and continue operation.

To increase system availability, more redundancy may be configured into a configuration. This can be done in a dual-host configuration by using two system disks (one for each boot node). In the event of one system disk failure, the remaining system disk would continue to serve one system and the satellite nodes booted through it. As with any VAXcluster, however, a second system disk improves availability while increasing system management tasks.

To build a dual-host configuration, perform the following steps:

1. Form a VAXcluster configuration. If your systems are not already clustered, you must cluster them. For more information, find the VMS VAXcluster manual that is part of the VMS documentation. If this manual is not available, contact your Digital representative.
2. Obtain an external DSSI cable which connects the two system enclosures. Order this through your Digital representative.
3. Change the DSSI node address of one system's CPU module.

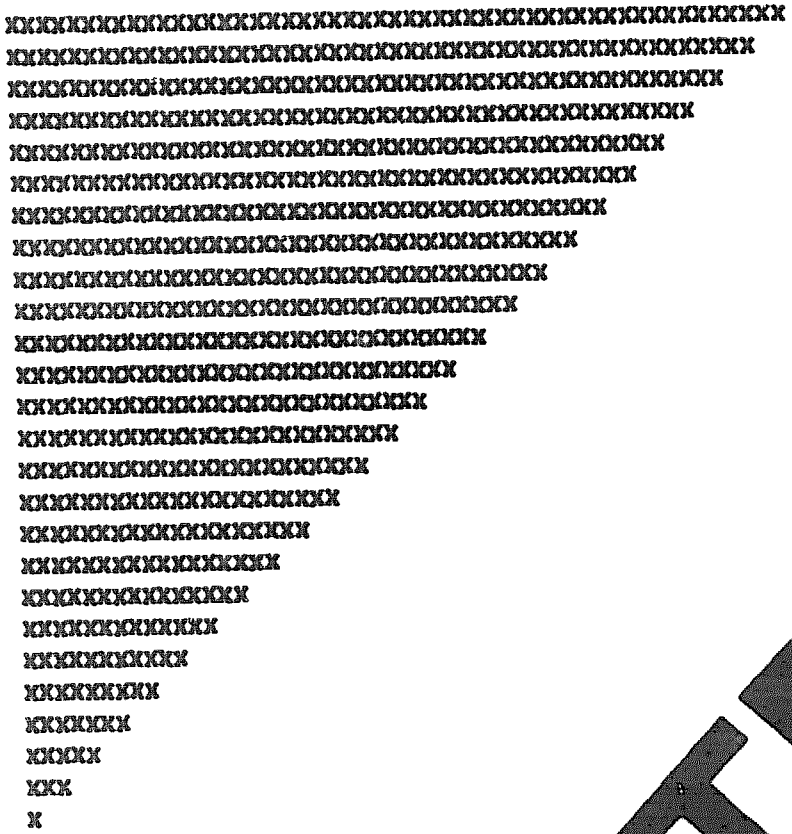
CAUTION

This should be performed by a qualified Digital service professional. Contact your service representative to schedule an appointment.

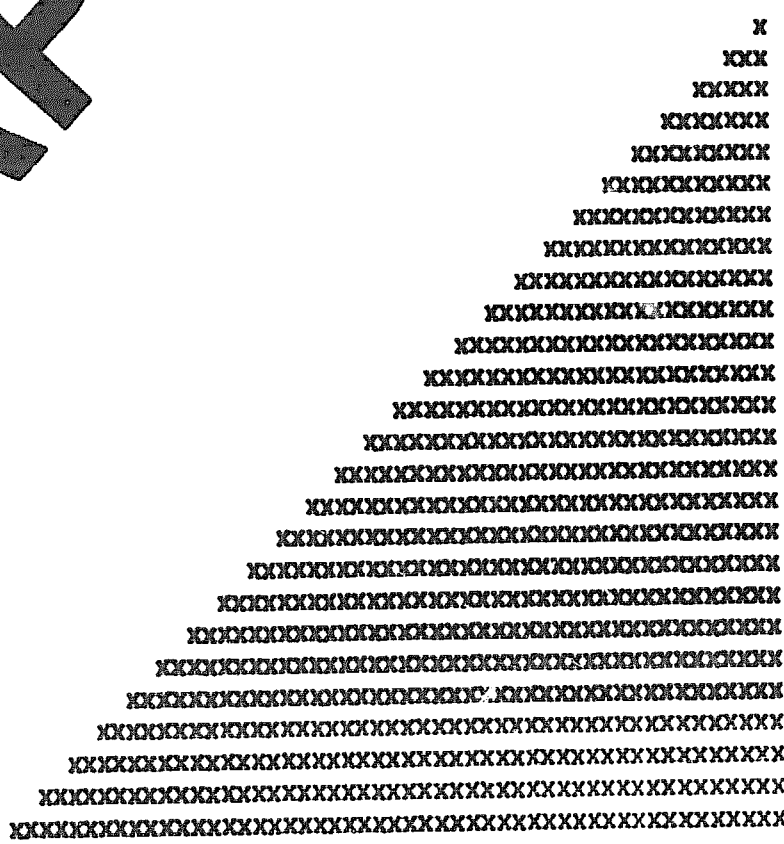
4. Change the Unit I.D. plugs that identify the disk drives to the system. (supplemental Unit I.D. plugs are included with your system.) When two systems are connected together, one system's disk drives may need to be renumbered using different Unit I.D. plugs (each device on a DSSI bus must have a unique address). For instructions on how to change a Unit I.D. plug, refer to the section on disk drives in Chapter 3 of this manual.

Note

The DSSI bus supports eight devices/adapters. With two DSSI adapters, the dual-host configuration supports a maximum of six DSSI devices.



CHAPTER 2



Chapter 2

Using the System

This chapter describes how to use your system once the system software has been installed.

2.1 Before You Use a New System

This chapter assumes that your system has been properly installed by a Digital service representative. Installation includes running the diagnostic software shipped with your system. To install operating system options or layered products, see the instructions in your system software installation manual or layered product installation manual. Some of the instructions may require you to remove the front panel of the system to change switch settings.

The remainder of this chapter assumes that system software has been installed.

2.2 Switch Settings

Switch settings vary, depending on the operation being performed. The next two sections describe switch settings for normal and for special operations. Set the switches according to your needs.

2.2.1 Normal Operation

Switch settings for normal operation are:

- The Halt button on the operator control panel is set to out.
- The Break Enable/Disable switch on the CPU cover panel is set to disable (dot outside the circle). With break disabled, your system automatically boots system software when powered up. Once system software is installed, Digital recommends you run your system with break disabled to prevent the user of the console terminal from inadvertently halting the system by pressing Break on the console terminal. Halting the system causes all activity to stop.

CAUTION

Pressing in the Halt button halts the system regardless of the setting of the Break Enable/Disable switch on the CPU cover panel.

- The Power-Up Mode switch on the CPU cover panel is set to Run (indicated by an arrow).
- The baud rate switch, located on the inside of the CPU cover panel, is set to 9600. If you need to change the baud rate, for example, to use a non-Digital terminal, you must remove the CPU cover panel. Instructions on changing the baud rate are in the technical information section of the customer kit.
- The Write-Protect button for each ISE is set to out (not lit). Either the A or B button (or both) for each drive is in. This setting puts the drive on-line. The difference between A and B is the port used for communications between the drive and the controller.

2.2.2 Special Operation

Certain operations require that you change some of the normal operating settings.

Note

When you change the Break Enable/Disable switch from one setting to the other, you must activate the new setting by resetting the system. To reset the system, press the Reset button on either power supply. All processes will be interrupted.

- If you need the ability to halt the system from the console terminal, for example, when installing system software or performing certain types of backup, you can set the Break Enable/Disable switch to enable (dot inside the circle). This allows you to halt the system by pressing Break on the console terminal.
- If your system has been powered off for more than seven days, the battery unit that saves the system clock and the language selection may be depleted. Each time you power up the system, the CPU determines whether or not the battery power is sufficient. If the battery power is depleted, the Language Selection Menu appears, as shown in Figure 2–1.

Figure 2–1: Language Selection Menu

```
KA640-A T3.4-2 VMB 2.3

 1) Dansk
 2) Deutsch (Deutschland/Österreich)
 3) Deutsch (Schweiz)
 4) English (United Kingdom)
 5) English (United States/Canada)
 6) Español
 7) Français (Canada)
 8) Français (France/Belgique)
 9) Français (Suisse)
10) Italiano
11) Nederlands
12) Norsk
13) Português
14) Suomi
15) Svenska
 (1..15):
```

CS-7713

Select a language by typing in the number listed next to the language.

If the Power-Up Mode switch is set to Run Mode (indicated by an arrow), then the language selected is saved and is automatically used during subsequent reboots of the system.

If the Power-Up Mode switch is set to Language Inquiry Mode (indicated by the human profile), the system will prompt for the language at each power-up.

Once the system is booted, reset the system clock as described in your system software manual.

If you want data on a particular fixed disk to be write-protected, you must set the Write-Protect button to in (indicator glows).

Note

Disks containing system software and user accounts must remain write-enabled. Disks containing applications or sensitive data may be write-protected.

2.3 Turning On the System

Once you have set the switches correctly, you are ready to turn on the system.

Turn on the system as follows:

1. Turn on the console terminal and wait for it to complete its self-tests.
2. Turn on the system by setting the power on/off switch to 1. The switch glows to indicate power to the system.

When you turn on the power, you should see the indications listed in Table 2–1.

Table 2–1: Normal Power-On Indications

Indicator	Normal Indication
On/Off switch	Glows amber
System DC OK light	Glows green
RF30/RF71 ready lights	Glow green steadily within 20 seconds
TK70 tape drive indicator lights	Orange, yellow and green lights glow during self-tests. The yellow light blinks alone for several seconds and then the green light glows steadily.
TK50 tape drive indicator lights	Load/Unload button glows for approximately four seconds. When the red light goes off and the green light comes on, you can move the cartridge release handle.

If the power-on indications are not as listed in Table 2–1, refer to *MicroVAX Troubleshooting and Diagnostics*.

Every time you turn on your system, it runs a series of self-tests on the CPU and memory.

The console terminal first displays a line of information identifying the CPU, the version of the microcode, and the version of VMB—the primary bootstrap program (see Figure 2–2). Version numbers may differ from those on your system. The console terminal then displays a countdown as the system tests itself. When the self-tests are successful, the system either autoboots system software or goes into console mode, as described in Section 2.4.1 and Section 2.4.2. When your system detects an error during its self-tests, it displays an error summary consisting of hexadecimal numbers. A Digital service representative can use the error summary to diagnose the system. Depending on the type of error, one or more error summaries may display on the console terminal. A sample error summary is shown in Figure 2–2.

Figure 2–2: Sample Error Summary

```
KA640-A T3.4-2 VMB 2.3

Performing normal system tests.
41..40..39..38..37..36..35..34..33..32..

?58 2 01 FF 00 0000

P1=00000000  P2=00000000  P3=00000000  P4=00000000  P5=00000000
P6=00000001  P7=00000000  P8=2004E4D4  P9=201406B4 P10=20053510
r0=00000054  r1=20100100  r2=2010C380  r3=0000001C  r4=20100005
r5=20100001  r6=7DDDE3FF  r7=20084600  r8=2010E3E0 ERF=800001C0

Normal operation not possible.

>>>
```

CS-7714

If possible, print out the error summary and give it to your Digital service representative.

2.4 Booting the System

The system boots in one of two ways. You can manually boot the system from console mode, or you can configure the system to autoboot on power-up. The setting of the Break Enable/Disable switch determines how the system boots.

2.4.1 Autobooting the System

When the Break Enable/Disable switch is set to disable (dot outside the circle), the system runs self-tests. On completion of the self-tests, the system attempts to load system software.

Selecting a Boot Device

When attempting to load system software, the system does not test all devices in search of bootable software. Rather it looks for a previously selected boot device.

If you have not selected a boot device, the system issues a list of bootable devices and prompts you to select a boot device from the list, as shown in Figure 2–3.

Figure 2–3: Successful Power-On to List of Bootable Devices

```
KA640-A T3.4-2, VMB 2.3

Performing normal system tests.
41..40..39..38..37..36..35..34..33..32..31..30..29..28..27..26..
25..24..23..22..21..20..19..18..17..16..15..14..13..12..11..10..
09..08..07..06..05..04..03..
Tests completed.
Loading system software.
No default boot device is set.

Devices:
--DIA0 (RF30)
--MUA0 (TK70)
--ESA0 (08--00--2B--08--E7--A4)
--DEVICE? [ESA0]:
```

CS-7715

If you do not type a device name within 30 seconds, the system boots by default from the Ethernet adapter, ESA0.

If you type in a device name within 30 seconds, the system boots from that device.

When the boot device is identified, the number "2" displays on the screen. As the system begins booting from a device, the countdown continues from 1 to 0.

Once you have selected a boot device from the list of bootable devices, the system boots from that device at each power-up (as long as the system is set to autoboot.)

Figure 2–4 shows a successful power-on and automatic boot when the device, DIA0, has been selected as a boot device.

When a boot device is identified, the system autoboots from that device each time you turn it on, until you do one of the following.

Figure 2–4: Successful Power-On and Automatic Boot

```
KA640-A T3.4-2, VMB 2.3

Performing normal system tests.
41...40...39...38...37...36...35...34...33...32...31...30...29...28...27...26...
25...24...23...22...21...20...19...18...17...16...15...14...13...12...11...10...
09...08...07...06...05...04...03...
Tests completed.
Loading system software.
(BOOT/R5:0 DIA0)

   2.
--DIA0
       1...0...
```

CS-7716

- Change the boot device through one of the following methods:
  1. Using the SET BOOT *device name* command from console mode
  2. Selecting a new boot device when the bootable device list appears with the system in Language Inquiry Mode.
- Change the setting of the Break Enable/Disable switch to enable (dot inside the circle). (If you do so, the system will not autoboot but will enter console mode after completing self-tests.)

Note

Selecting a default boot device other than the Ethernet adapter, ESA0, is not appropriate for diskless and tapeless systems which must boot software over the network.

Using the SET BOOT Command

The SET BOOT command identifies the boot device to the system. To use the command, put the system into console mode by pressing the Halt button twice. At the >>> prompt, enter "SET BOOT *device_name*." For example, "SET BOOT ESA0" sets the system default boot device to be the on-board Ethernet controller. Once you have selected a boot device, the system autoboots from that device each time you turn it on.

To determine the name of the boot device refer to Table 2–2.

Table 2–2: Device Names

Controller Type	Controller	Device Name
DSSI	On-board CPU	DImn[1]
TMSCP	TQK70	MUmn
PROM	MRV11	PRAn
Ethernet adapter	On-board CPU	ESAn

[1] m = MSCP controller designator (A = first, B = second, etc.)
n = unit number

For more information about the system's booting process, refer to the technical information section of the customer kit.

2.4.2 Booting the System from Console Mode

When the Break Enable/Disable switch is set to enable (dot inside the circle), the system powers up to console mode (indicated by the >>> prompt) after successfully completing its self-tests. Figure 2–5 shows a successful power-on to console mode.

To load system software from console mode, you must use the BOOT command (BOOT device-name) at the >>> prompt. For example,

```
>>>BOOT MUA0
```

tells the system to boot software from a cartridge in the TK50/TK70 tape drive.

Software manuals may instruct you to power up with break enabled and to use the BOOT command.

2.5 Using the System

Once the system software is loaded, the first display for the system software appears on the console terminal after a few seconds. That display is described in the system software documentation.

You are now ready to use the system. Refer to the system software manual and application manual for more specific instructions on using the system.

Figure 2–5: Successful Power-On to Console Mode

```
KA640-A T3.4-2, VMB 2.3

Performing normal system tests.
41...40...39...38...37...36...35...34...33...32...31...30...29...28...27...26...
25...24...23...22...21...20...19...18...17...16...15...14...13...12...11...10...
09...08...07...06...05...04...03...
Tests completed.
>>>
```

CS-7717

Your system software manuals cover the following:

- Installing software on your system
- Running software to perform tasks
- Making and restoring backup copies of system software or data files
- Accessing devices and utilities in your system

2.6 Turning Off the System

Do not turn off your system unless it requires maintenance or you know of a planned power outage.

CAUTION

Turning off your system without following the shutdown procedure described in your system software manuals may result in loss of data.

Once you have completed the recommended procedure, you can turn off your system by setting the on/off switch to 0.

2.7 Halting the System

Halting the system interrupts all processes and returns control to the console program. You may need to halt the system during software installation. Or, you may want to boot the system from another device; for example, a tape cartridge containing MicroVAX Diagnostic Monitor (MDM) software.

CAUTION

Halting your system without following the shutdown procedure described in your system software manuals may result in loss of data.

You can halt the system in two ways. You can press the halt button twice—in to halt the system and out to enter console mode. Or you can press the Break key on the console terminal, if the Break Enable/Disable switch on the CPU cover panel is set to enable. When the console mode prompt >>> appears on your screen, the system is halted.

Note

When you change the Break Enable/Disable switch from one setting to the other, you must activate the new setting by resetting the system. To reset the system, press the Reset button on a power supply. All processes will be interrupted.

If you inadvertently halt the system, type Return at the console prompt: >>>c. The processes interrupted by the halt continue.

With dual-host configurations, you can halt one processor without affecting the other. As long as the system disk is spinning and on-line, the second system continues to operate normally.

2.8 Restarting the System

CAUTION

Do not press the Restart button while in console mode. Doing so destroys the system state. You will not be able to continue normal operation.

Restarting the system allows you to reboot the system software without performing the start-up tests. For example, if you system is hung, you can press Restart and the system reboots.

With a dual-host configuration, you can restart on processor without affecting the other. As long as the system disk is spinning and on-line, the second CPU continues to operate normally.

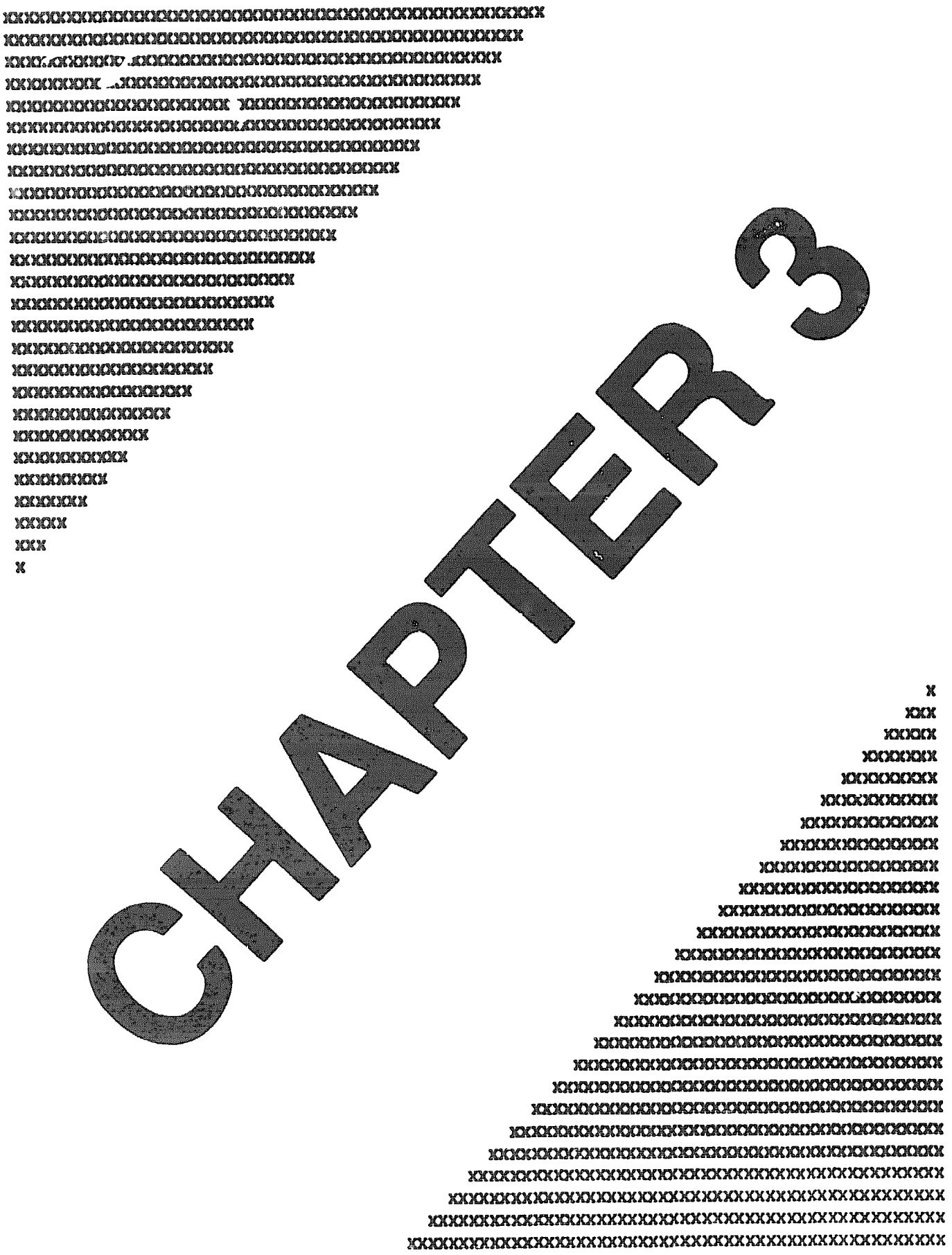
2.9 Resetting the System

Resetting the system allows you to return the system to a power-on condition without turning it off. The usual power-on self-tests are run. Resetting the system aborts all current and pending operations.

CAUTION

Resetting your system without following the shutdown procedure described in your system software manuals may result in loss of data.

Reset the system by pressing the Reset button on either power supply.


CHAPTER 3

Chapter 3

Using System Options

This chapter describes how to use options that may already be part of your system or can be added to the system. The following types of options are covered:

- Mass storage devices and controllers
- Communications controllers
- Real-time controllers
- Printers

Note

Some of these options may not be appropriate for VAXserver systems. Contact your Digital representative if you have any questions about whether a specific option is appropriate for your system.

3.1 Mass Storage Options

The following mass storage options are available:

- RF30/RF71 ISE
- TK50/TK70 tape drive

This chapter describes how to use the controls for mass storage devices. In the case of removable media, it also describes how to insert and remove the media. To use any mass storage device, you must properly identify the device to the operating system and use appropriate operating system commands. Refer to your system software documentation for details.

3.1.1 ISE

ISEs provide high-volume mass storage for the system. Your system may have up to three RF30/RF71 ISEs.

When your system has multiple disks, Digital recommends that you separate them according to function. For example, if your system has two disks, you may want to use them as follows:

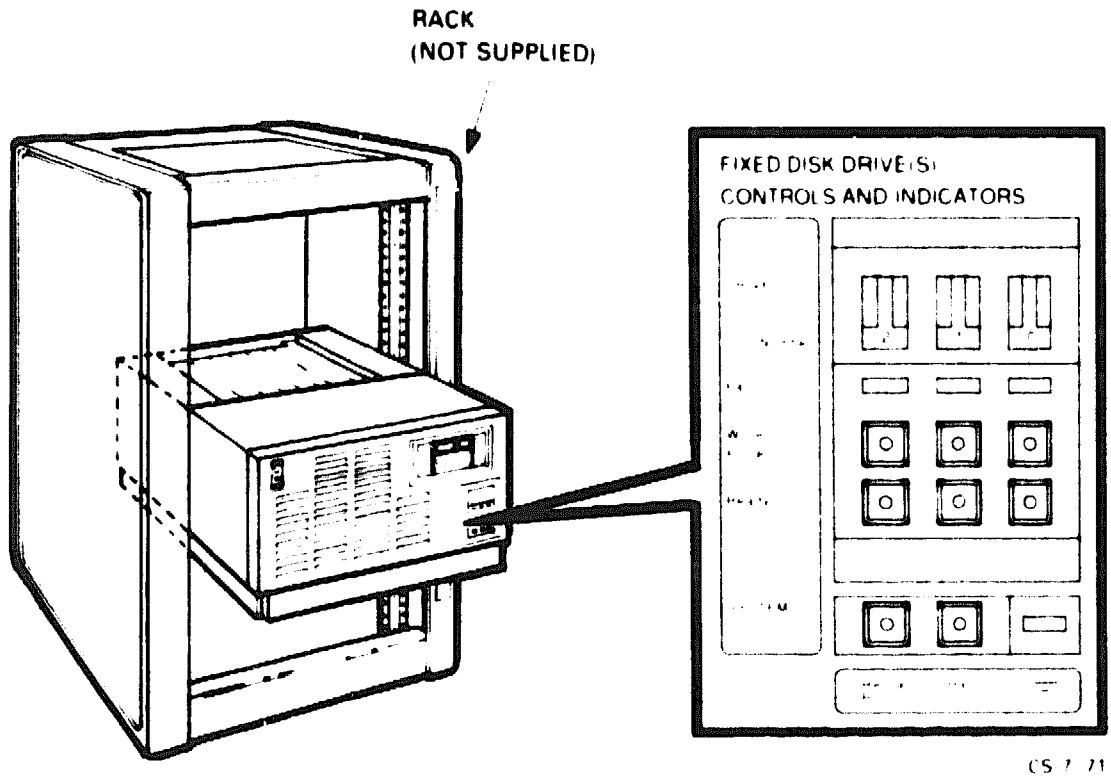
- Disk 0 contains the operating system and applications installed on the system.
- Disk 1 contains work areas for each user with an account on the system.

The storage capacities and other specifications of each fixed-disk drive are listed in the technical information section of the customer kit.

ISE Controls

Controls for the ISEs are located on the front of the system. Figure 3–1 shows the controls and indicators for the ISEs.

Figure 3–1: Controls and Indicators



The system has controls and indicators for three ISEs. Each drive has the following controls and indicators arranged in a column on the control panel.

- Unit I.D. plug
- Fault light
- Write-Protect button
- Ready button

Unit I.D. plugs identify the unit number of the drives to the system.

Table 3–1 lists the function of each ISE control.

Table 3–1: Controls and Indicators

Control	Position	Function
Fault	Lit	Indicates an error condition within the disk drive.
	Not lit	Indicates an error-free condition within the disk drive.
Write-Protect	In (lit)	Disk is write-protected. Prevents system software from writing on the disk.
	Out (not lit)	Disk is not write-protected. Normal position for software operation. System software is free to read or write information on the disk.
Ready	Out	The drive is online. When the drive is available for use, the green indicator light in the switch is on. when the drive is being used, the green indicator light is off.
	In	The drive is offline and cannot be accessed. The green indicator light cannot be lit when the Ready button is in.

The Write-Protect button controls whether the system can write data to the disk drive. The system can read from the disk regardless of the setting of the Write-Protect button. When the Write-Protect button is out (not lit), the system can write to the disk. Your system disk (the disk containing system software) and disks containing work areas for users should be write-enabled, the normal operating setting.

If you want to write-protect a disk containing sensitive data that you do not want changed or accidentally erased, set the Write-Protect button to in (lit).

Changing the Unit I.D. Plugs

Spare unit I.D. plugs are supplied with your system. When systems are configured in a dual-host configuration, you use the spare Unit I.D. plugs to renumber the unit numbers of one system's disk drives.

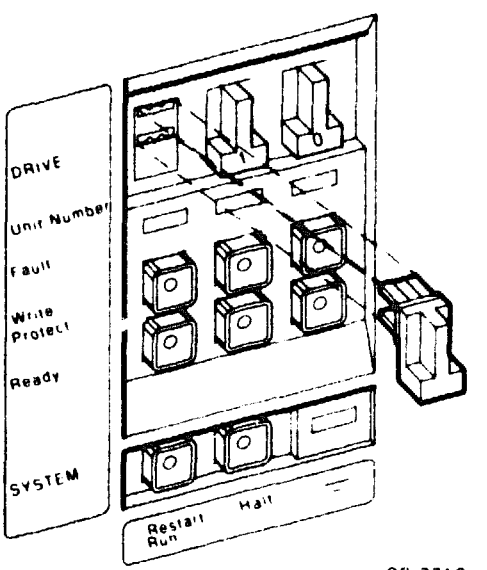
The I.D. plugs have prongs on the back that indicate the unit number of the drive. When changing the order of I.D. plugs or adding new I.D. plugs, the new unit number is identified to the system once you have cycled power on the system.

Note

If the Unit I.D. plug for a ISE is changed while the system is powered on, the system must be powered off, then on again, before the new unit number is recognized.

To remove an I.D. plug, grasp it firmly and pull it out. To insert an I.D. plug, align the two center prongs with the two center slots and press it in. See Figure 3–2.

Figure 3–2: Inserting and Removing Unit I.D. Plugs



3.1.2 TK50 Tape Drive Instructions

The TK50 tape drive is located in the upper right corner of your system. The drive holds one removable TK50 magnetic tape cartridge. You can use a cartridge as both an input and an output device. As an input device, you use the cartridge to load software or data into your system. As an output device, you use the cartridge to make copies (or backups) of software or data, or as a journaling device to record input to the system.

The tape drive has two primary controls:

- Cartridge release handle
- Load/Unload button

You use the cartridge release handle to insert or remove cartridges, and to lock them into position.

To insert or remove a tape cartridge, pull handle open. To lock a tape cartridge into position, push handle closed.

Use the Load/Unload button to control winding or rewinding of the tape. The button is a 2-position control.

When you press in the button, the tape winds onto the take-up reel.

When you press the button again, it pops out and the tape rewinds back into the tape cartridge.

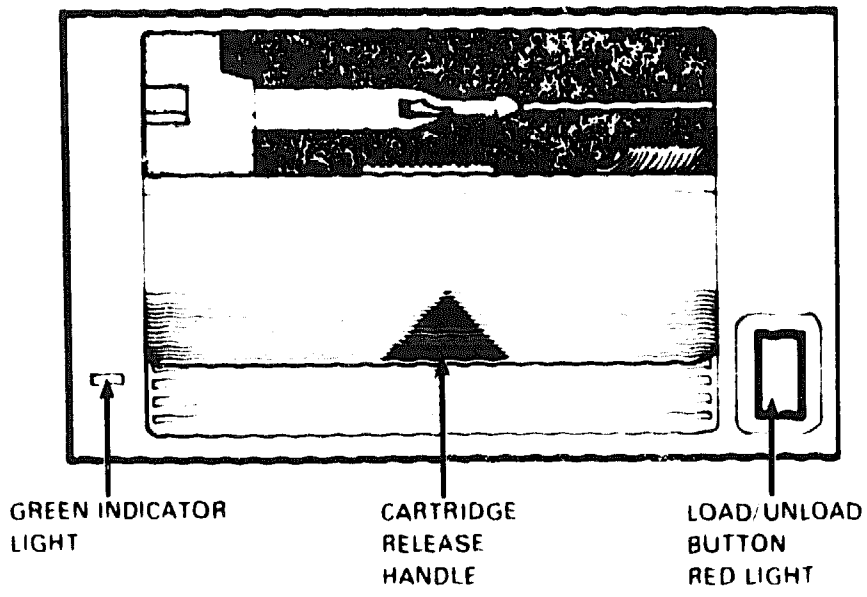
The drive also has two indicator lights that indicate the status of the drive.

- Red light is part of the Load/Unload button.
- Green indicator light is at the opposite end of the drive.

Figure 3–3 shows the TK50 tape drive with the controls and indicator lights labeled.

To operate the drive properly, carefully monitor the indicator lights. The instructions for inserting and removing cartridges, which appear later in this section, tell you exactly what should happen at each step. Table 3–4 at the end of the section summarizes light and control combinations.

Figure 3–3: TK50 Tape Drive

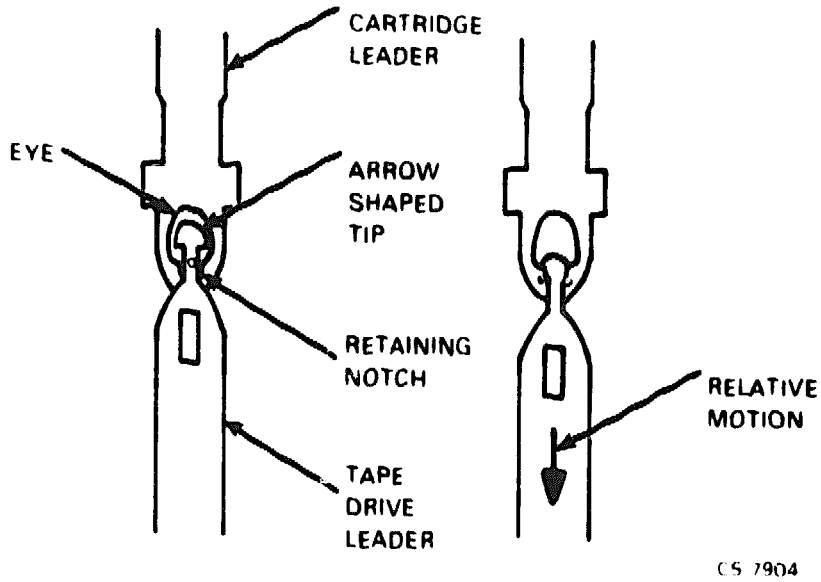


3.1.3 Operating the TK50 Tape Drive

The TK50 tape drive operates like a reel-to-reel tape deck. Inside the drive is a take-up reel with a leader attached. Inside the cartridge is a single reel containing the magnetic tape. When you insert the cartridge and press in the Load/Unload button, the leader in the drive automatically couples with the leader in the cartridge, and the tape winds onto the take-up reel. The coupling and winding process is called loading. When the automatic loading process completes, the cartridge is ready to use.

The method of coupling the two leaders is similar to threading a needle. The leader in the cartridge has a large eye with a notch. The leader in the drive is arrow-shaped. See Figure 3–4.

Figure 3–4: Tape Leaders



3.1.3.1 Loading the TK50 Tape Cartridge

Loading occurs in two stages:

1. When you insert a cartridge, the leader in the drive first threads through the eye of the cartridge leader.
2. When you press in the Load/Unload button, the take-up reel begins to move. The drive leader catches in the notch and pulls the tape onto the take-up reel.

3.1.3.2 Unloading the TK50 Tape Cartridge

Once the cartridge is loaded, you cannot remove it without rewinding and uncoupling the leaders, a process called unloading. Even if you have not used the tape, you must unload it before you can remove the cartridge. When you set the Load/Unload button to the out position, the tape rewinds into the cartridge and the leaders uncouple.

Although rare, rough handling during shipment may dislodge either the cartridge leader or the drive leader. Because the position of each leader is critical to successful coupling, make sure the leaders are properly positioned.

Check the cartridge leader in the following situations:

- When you use a cartridge for the first time. (The cartridge could be blank or could contain software.)
- After you drop a cartridge, since the shock can dislodge a leader.
- When you have load/unload problems.

Check the tape drive leader in the following situations:

- When you first install the system.
- After you move the system.
- When you have load/unload problems.

The following two sections explain how to check each leader.

3.1.3.3 Checking the Cartridge Leader

To check the cartridge leader:

1. Open the door in the back of the cartridge.
2. With your thumb, lift the door lock as shown in Figure 3–5.
3. Press on the hinge.

Result: The door swings open. The tape leader should appear exactly as shown in Figure 3–5, with most of the leader eye visible.

Figure 3–5: Cartridge Leader Check

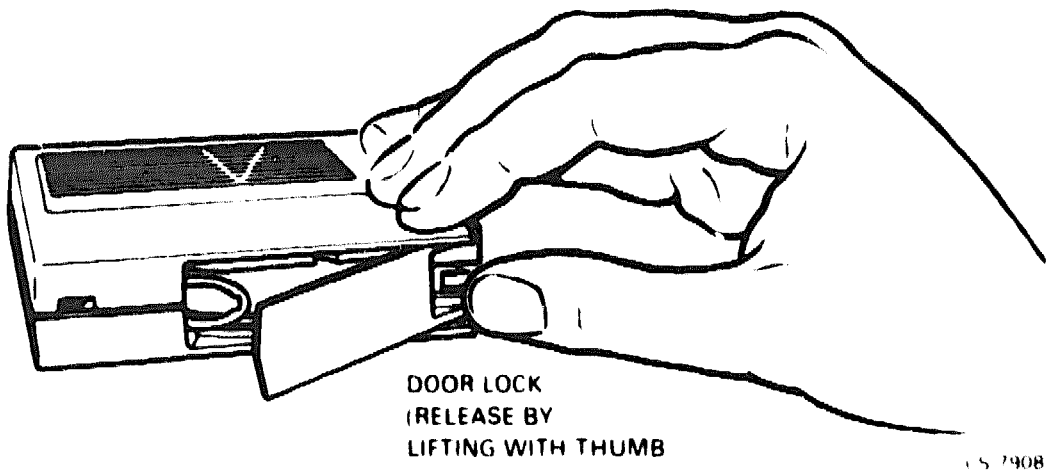


Table 3–2: Cartridge Check

If	Then
No leader is visible, or if more leader is visible than is shown in the figure	Do not load the cartridge into your tape drive or try to adjust the leader. Contact your Digital service representative for another cartridge.
Leader appears normal	Close the cartridge door and proceed.

CAUTION

Using a cartridge with a mispositioned leader can damage the tape drive.

3.1.3.4 Checking the Drive Leader

To check the leader in the drive, look inside the drive (you may need to use a light). Look for two things:

1. The pointed end of the leader is clearly visible and straight (not bent up or down).
2. The leader is hooked onto the buckling link, as shown in Figure 3–6.

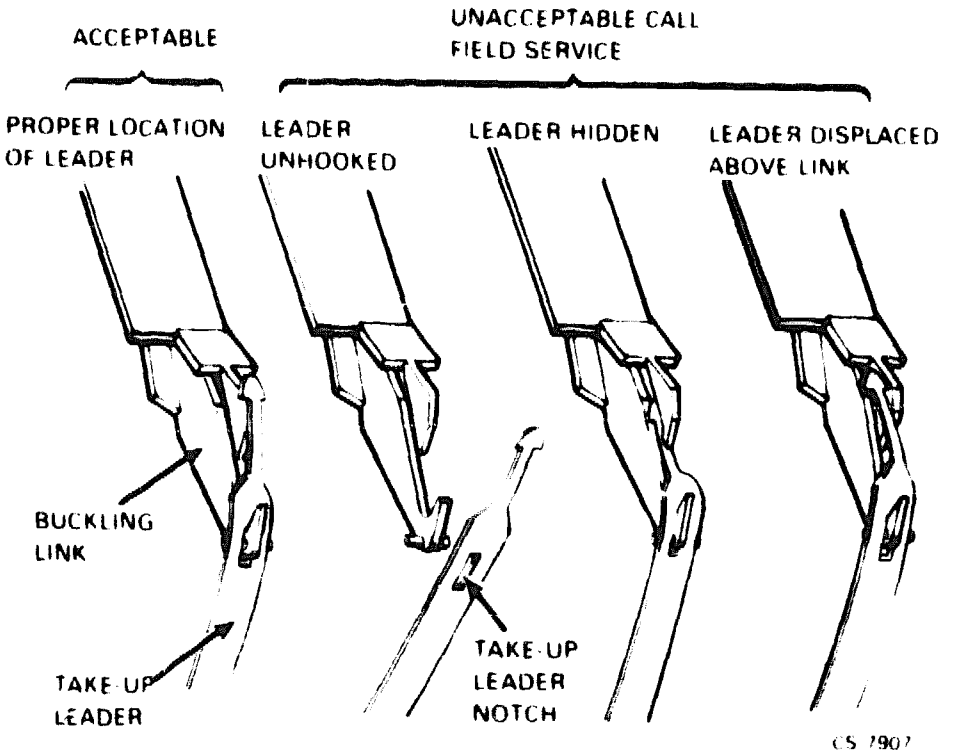
If the leader is unhooked, or if you cannot clearly see the pointed end, do not insert the cartridge into the drive or attempt to fix the drive leader. Contact your Digital service representative.

CAUTION

Using a tape drive with a mispositioned leader can damage your system.

If the cartridge leader and the drive leader appear normal, proceed with the next step for labeling the cartridge.

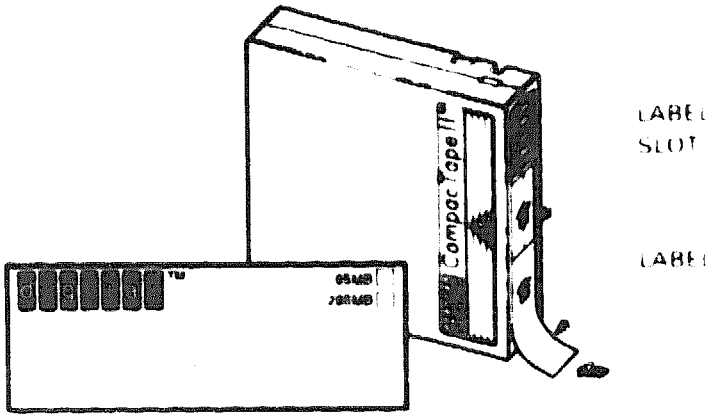
Figure 3–6: Drive Leader Check



3.1.3.5 Labeling a Tape Cartridge

Label your cartridge. For your convenience, a slot for the label is on the front of the cartridge. Write the identification on the label, and insert the label in the slot on the front of the cartridge, as shown in Figure 3–7. The label is visible when the tape is in the drive.

Figure 3–7: Tape Cartridge Label



Note

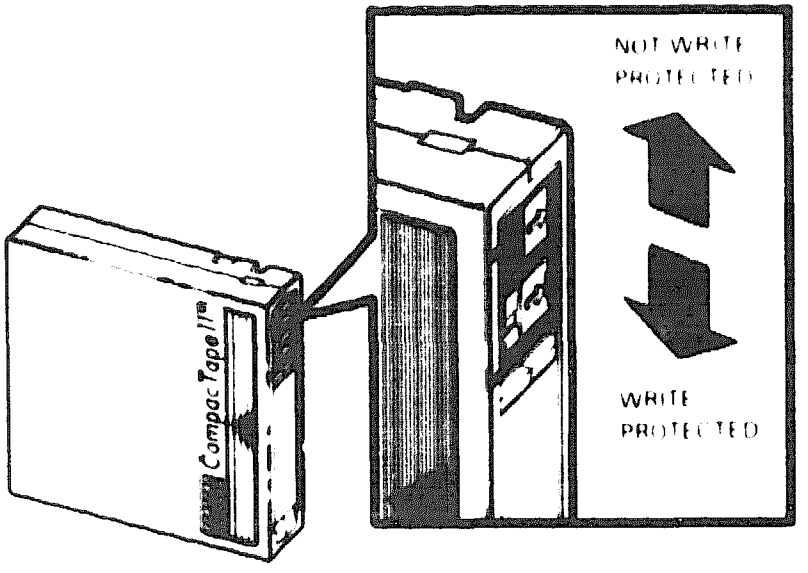
Do not write on the tape cartridge or attach labels to the top, bottom, or sides of the cartridge.

3.1.3.6 Write-Protecting a Tape Cartridge

Write-protecting a tape cartridge prevents accidental erasure of information stored on the tape. You set the write-protect status with a 2-position switch on the cartridge. Your system can read information on the tape regardless of the position of the write-protect switch. However, the system cannot write data to the tape when the write-protect switch is set to the write-protect position.

When you use a cartridge to install software, make sure the cartridge is write-protected. Two icons on the switch indicate the write-protect status, as shown in Figure 3–8. An orange rectangle is visible when the switch is in the write-protect position. If you do not see an orange rectangle, slide the switch toward the label slot.

Figure 3–8: Write-Protect Switch



Note

Early versions of the cartridges do not have the orange rectangle. Use the icons as guides.

When you use a cartridge to make a backup copy, to copy files, or to record input to the system, make sure the write-protect switch is set to enable writing to the tape. To enable writing, slide the switch away from the label slot until the switch locks into place.

Generally, you set the write-protect switch before you insert the cartridge into the drive. You can change the write-protect status of the cartridge while it is in the drive, but the TK50 tape drive may not immediately recognize the change. To guarantee that the tape drive recognizes the change in status, do the following:

1. Unload the tape by setting the Load/Unload button to the unload (out) position.

   Result: Both the red and green lights blink while the tape is rewinding. The red light glows steadily as the tape unloads into the cartridge.

   When the tape is completely unloaded, the red light goes off and the green light comes on.

2. Move the write-protect switch to the new setting.
3. Set the Load/Unload button to the load (in) position to reload the tape.

   Result: The red light comes on while loading.

   When the green light also comes on, the tape is ready to use.

The drive now recognizes the new write-protect status.

3.1.3.7 Handling and Storing Tape Cartridges

When handling or storing the tape, consider the following:

- Do not touch the exposed surface of the tape.
- Do not drop the tape cartridge. The impact from a fall can damage the tape cartridge.
- Allow new tapes to stabilize at room temperature for 24 hours before using them.
- Place an identification label only in the label slot on the front of the tape cartridge.
- Store tape cartridges in a dust-free environment.
- Keep tape cartridges away from direct sunlight, heaters, and other sources of heat. Store tape cartridges in a stable temperature between 10° and 40°C (50° and 104°F).
- Store tape cartridges where the relative humidity is between 20 and 80%.
- Keep tape cartridges away from magnets and equipment that generates magnetic fields, such as motors, transformers, terminals, and audio equipment.
- Keep tape cartridges away from x-ray equipment.

3.1.3.8 Inserting a Tape Cartridge

Use the following procedure to insert a tape cartridge, and see Figure 3–9.

1. Before you use the tape drive, make sure the system is turned on (the power switch glows) and the Load/Unload button is in the unload (out) position.

   Result: The Load/Unload button glows red for approximately four seconds when you power on your system.

   When the red light goes off and the green light comes on, you can move the cartridge release handle.

2. Push the cartridge release handle to the left.

3. Position the cartridge so the arrow on the cartridge faces left and points toward the drive. Insert the cartridge into the TK50 tape drive until you feel the cartridge lock into place.

   Result: The red light comes on. The green light goes off.

4. Push the cartridge release handle to the right.

   Result: The red light goes off. The green light comes on.

5. Set the Load/Unload button to the load (in) position.

   Result: The red light comes on. The green light goes off.

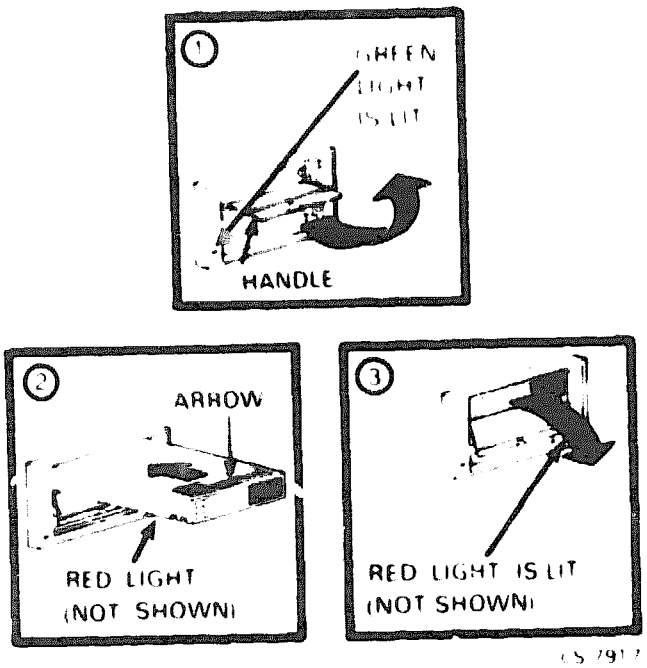
The tape loads in 10–15 seconds. During loading, the two leaders couple and the tape winds onto the take-up reel inside the tape drive. The red light remains on during loading.

When the green light also comes on, the tape drive is ready to use.

Refer to your system software documentation for instructions on how to use the tape cartridge, for example, how to load software or perform backup.

If a cartridge is new, the system performs a calibration sequence that takes approximately 40 seconds. The green light blinks rapidly and irregularly during calibration.

Figure 3–9: Tape Cartridge Insertion



3.1.3.9 Removing a Tape Cartridge

You must unload a tape before you can remove the cartridge from the tape drive. Use the following procedure and see Figure 3–10.

1. Set the Load/Unload button to the unload (out) position.

   Result: The red and green lights blink slowly, but not in unison, as the tape rewinds to the beginning. This may take up to 90 seconds.

   Then, the red light remains on and the green light goes off as the tape unloads into the cartridge.

   The red light goes off and the green light comes on when the tape is unloaded.

2. Push the cartridge release handle to the left, only after the green light comes on.

Note

Rewinding a tape can also be done under software control. Refer to your software manual for information.

3. Remove the tape cartridge and store it in a safe place.

CAUTION

Move the cartridge release handle only when the red indicator light is off and the green indicator light glows steadily. Moving the cartridge release handle while either indicator light is blinking could damage your system.

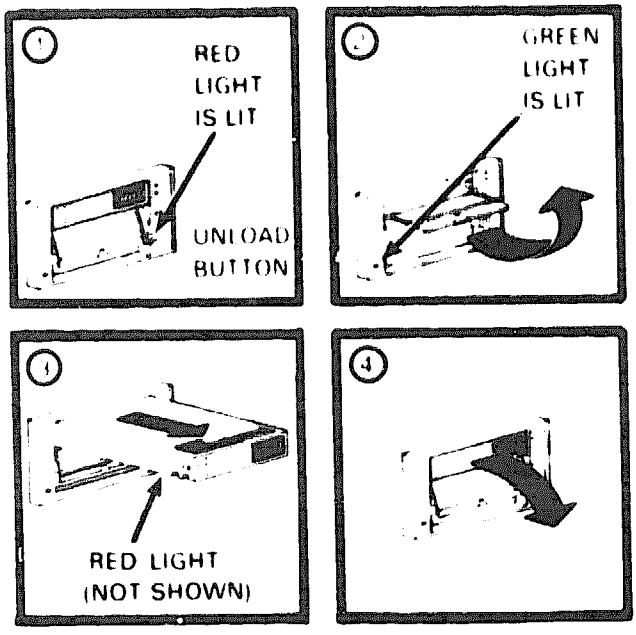
If the red light blinks rapidly at any time, press the Load/Unload button four times. If the problem persists, do not attempt to use the tape drive or remove the tape cartridge. Call your Digital service representative.

Remove the tape cartridge from the tape drive when the cartridge is not in use or before you turn off the system. Failure to remove the cartridge may damage it.

4. Push the cartridge release handle to the right.

Result: The green light remains on, indicating that there is power to the drive and that you can safely move the cartridge release handle.

Figure 3–10: Tape Cartridge Removal



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3.1.3.10 Summary of TK50 Tape Drive Controls and Indicator Lights

Table 3–3 summarizes the TK50 tape drive controls. Table Table 3–4 describes the meaning of the indicator lights.

Table 3–3: TK50 Controls

Control	Position	Function
Load/Unload button	In	Loads the tape (10–15 seconds).
	Out	Rewinds and unloads the tape.
Cartridge release handle	Left	Lets you insert or remove a tape after rewind and unload operations are completed.
	Right	Locks the tape in operating position.

Table 3–4: TK50 Indicator Lights

Green Light	Red Light	Condition
Off	Off	Tape drive has no power.
On	Off	Safe to move cartridge release handle. Power is present.
Off	On	Do not move the cartridge release handle. One of the following is in effect: • Power-on self test is occurring. • Cartridge is inserted but handle is still left. • Tape is loading or unloading. • Tape is stopped.
On	On	Tape has loaded successfully.
Blinking	On	Tape is in motion (except rewind). Read/write commands are being processed. Irregular fast blinking means tape calibration is occurring.

Table 3–4 (Cont.): TK50 Indicator Lights

Green Light	Red Light	Condition
Blinking	Blinking	Tape is rewinding.
Off	Blinking rapidly	A fault is occurring. Press and release the Load/Unload button four times. If the problem persists, do not attempt to remove the tape cartridge. Call your Digital representative.

3.1.4 TK70 Tape Drive Instructions

The tape drive is located at the front of the system.

The tape drive holds one removable magnetic tape cartridge. The drive can read data written on either a COMPACTape II or COMPACTape cartridge. Identify the type of cartridge by the label on the cartridge.

You can use a COMPACTape II or COMPACTape cartridge as an input device to load software or data into your system. The TK70 drive can read data on both types of cartridges, written by either a TK70 or a TK50 drive. (The TK50 drive records data in a format different from that of the TK70.)

Use a COMPACTape II as an output device to make copies or backups of software or data. The TK70 drive cannot write to a COMPACTape II or COMPACTape that has been written by a TK50 tape drive.

Tape Drive Controls

The tape drive has two primary controls: the cartridge insert/release handle (subsequently referred to as "the handle") and the Unload button. You use the handle to insert or remove cartridges and lock them into position. Pull the handle open to insert or remove a tape cartridge. Push the handle closed to lock a tape cartridge into position and load the tape.

You use the Unload button to rewind and unload the tape. Unloading and rewinding can also be controlled by software. Refer to your system software manuals for appropriate commands.

The drive also has three indicator lights that let you know the status of the drive.

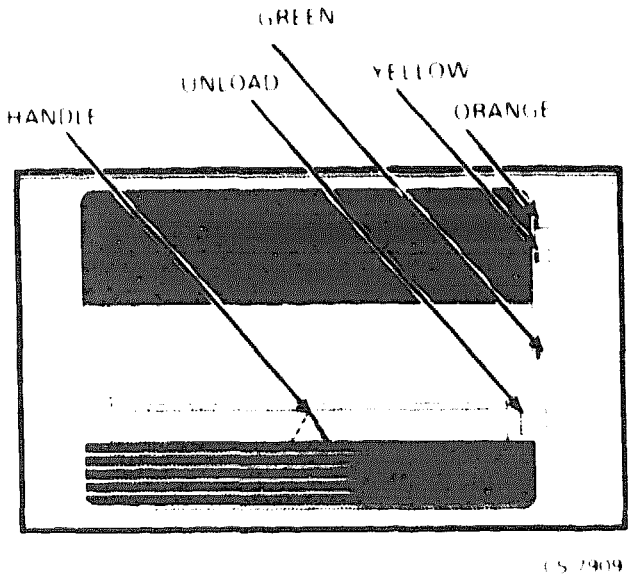
- Orange light (Write-Protected): A steady orange light indicates that the cartridge is write-protected.
- Yellow light (Tape in Use): A steady yellow light indicates that the tape is loaded. A blinking yellow light indicates that the tape is in motion.
- Green light (Operate Handle): A steady green light indicates that you can move the handle to insert or remove a tape. A blinking green light indicates a cartridge load fault. You can also move the handle when the green light is blinking.

All three lights blinking simultaneously indicates a fault condition.

Figure 3–11 shows the TK70 tape drive with the controls and indicator lights labeled.

To operate the drive properly, you must carefully monitor the indicator lights. The instructions for inserting and removing cartridges, which appear later in this section, tell what should happen at each step. A table at the end of the section summarizes light and control combinations.

Figure 3–11: TK70 Tape Drive



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3.1.4.1 Design of the Drive

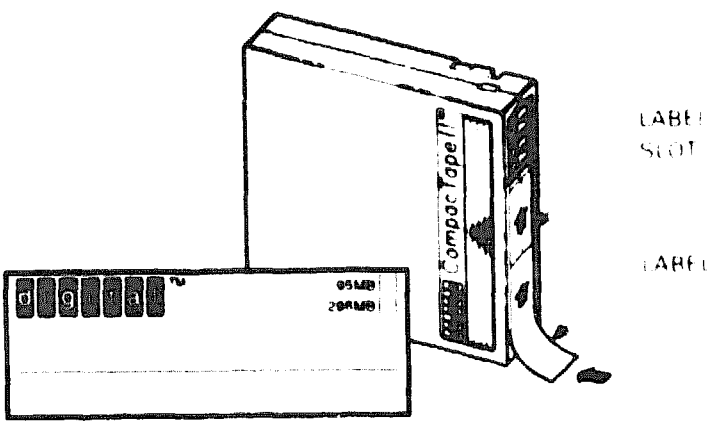
The tape drive operates like a reel-to-reel tape deck. Inside the drive is a take-up reel with a leader attached. Inside the cartridge is a single reel containing the magnetic tape. When you insert the cartridge and push in the handle, the leader in the drive automatically couples with the leader in the cartridge and the tape winds onto the take-up reel. The coupling and winding process is called loading. When the automatic loading process is complete, the tape is ready to use.

Once the cartridge is loaded, you cannot remove it without rewinding and uncoupling the leaders, a process called unloading. Even if you have not used the tape, it must be unloaded before the cartridge can be removed. When you press the Unload button, the tape rewinds into the cartridge and the leaders uncouple.

3.1.4.2 Labeling a Tape Cartridge

When recording data on a cartridge, label its contents. For your convenience, a slot for the label is provided on the front of the cartridge. Write the identification on the label and insert the label in the slot on the front of the cartridge, as shown in Figure 3–12. The label is visible when the tape is in the drive.

Figure 3–12: Labeling a Tape Cartridge



To indicate that the tape was recorded on a TK70 tape drive, check the box labeled 296MB. The 95MB box is used for tapes recorded on a TK50 drive.

Note

Do not write on the tape cartridge or attach labels to the top, bottom, or sides of the cartridge.

3.1.4.3 Write-Protecting a Tape Cartridge

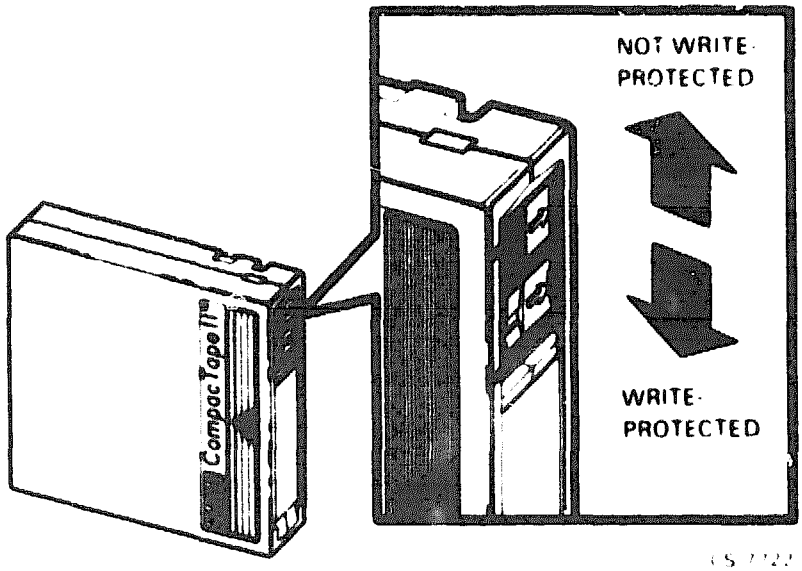
Write-protecting a tape cartridge prevents accidental erasure of information stored on the tape. You can write-protect a tape cartridge in two ways:

- Set the write-protect switch on the cartridge to the write-protect position.
- Write-protect the cartridge by using operating system commands described in your system software manuals.

Your system can read information on the tape regardless of the position of the write-protect switch or whether writing is software-disabled. However, the system cannot write data to the tape when the write-protect switch is set to the write-protect position, or when writing is software disabled.

When you use a cartridge to install software, make sure the cartridge is write-protected. Two icons on the switch indicate the write-protect status, as shown in Figure 3–13. An orange rectangle is visible when the switch is in the write-protect position. If you do not see an orange rectangle, slide the switch toward the label slot.

Figure 3–13: Tape Cartridge Write-Protect Switch



When you insert a write-protected cartridge into the drive, the orange indicator light comes on. The system recognizes the tape as being write-protected under any one of the following conditions:

- The write-protect switch on the cartridge is set to the write-protect position.
- An operating system command has write-protected the tape.
- A tape recorded on a TK50 tape drive is inserted into the drive.

Removing write-protection depends on how the tape was recorded and how it is write-protected. You cannot write-enable a tape recorded on a TK50 tape drive either by moving the write-protect switch on the cartridge or by using software commands. The TK70 drive always recognizes a tape recorded on a TK50 drive as write-protected. You can remove write-protection on tapes recorded on a TK70 drive as follows:

- If the cartridge is write-protected *only* by the write-protect switch on the cartridge and not the operating system, moving the switch to the write-enabled position causes the orange light to go out at the end of the executing command.
- If the cartridge is write-protected *only* by a software command and not the write-protect switch, removing the operating system restriction causes the orange light to go out.
- If the cartridge is write-protected by *both* the switch on the cartridge and a software command, you must change the switch setting and remove the operating system restriction.

When you use a COMPACTape II cartridge to make a backup copy of files, make sure the orange write-protect light on the TK70 drive is off. If the light is not off, check for any of the write-protect conditions described above. Change the switch setting and/or operating system restriction as necessary. Do not begin your operation until the orange light goes off.

3.1.4.4 Tape Cartridge Handling and Storage Guidelines

- Do not touch the exposed surface of the tape.
- Do not drop the tape cartridge. The impact from a fall can damage the tape cartridge.
- Allow new tapes to stabilize at room temperature for 24 hours before using them.

- Place an identification label only in the label slot on the front of the tape cartridge.
- Store tape cartridges in a dust-free environment.
- Keep tape cartridges away from direct sunlight, heaters, and other sources of heat. Store tape cartridges in a stable temperature between 10° and 40° Celsius (50° and 104° Fahrenheit).
- Store tape cartridges where the relative humidity is between 20 and 80 percent.
- Keep tape cartridges away from magnets and equipment that generate magnetic fields, such as motors, transformers, terminals, and audio equipment.
- Keep tape cartridges away from x-ray equipment.

3.1.4.5 Inserting a Tape Cartridge

Before you use the tape drive, make sure the system is turned on (the power switch glows). During power-up, the tape drive runs self-tests that last a few seconds. All three lights (orange, yellow, and green) come on momentarily, then the yellow light blinks during the self-tests. At the end of the tests, the yellow light goes off and the green light comes on, accompanied by a short beep. The green light and the beep indicate that you can move the cartridge release handle.

CAUTION

Move the handle only when the green indicator light is on. Moving the handle while the yellow light is on could damage the drive. If all three lights blink rapidly at any time, a fault condition exists. Press the Unload button once. If the fault is cleared, the tape unloads. The yellow light blinks during unloading, then the green light comes on. If the fault is not cleared, the three lights continue to flash. Do not attempt to use the tape drive or to remove the tape cartridge. Call your Digital service representative.

Use the following procedure to insert a tape cartridge (see Figure 3–14):

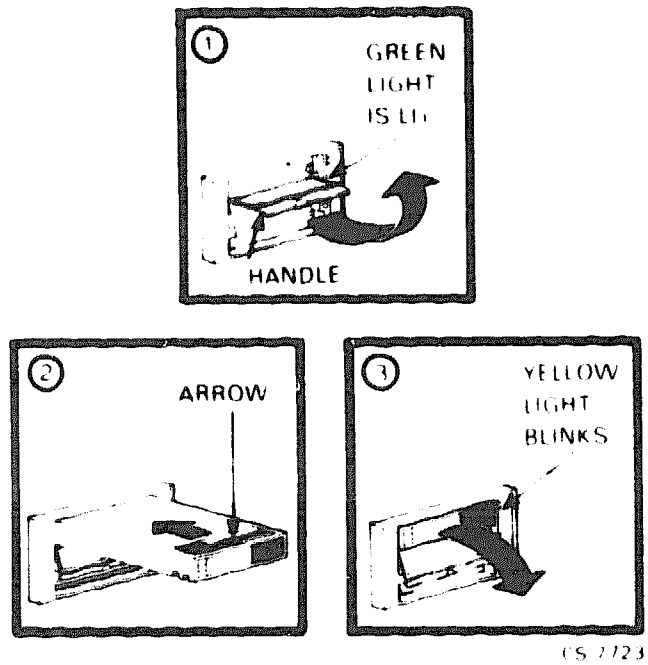
1. Pull the handle open.
2. Position the cartridge so the arrow on the cartridge faces left and points toward the drive. Insert the cartridge into the tape drive until you feel the cartridge lock into place.
3. Push the handle closed.

   The green light goes off and the yellow light blinks as the tape loads. When the yellow light glows steadily, the tape is ready to use.

Note

If the green light blinks rapidly when you push the handle closed, the drive has detected a cartridge fault. Pull the handle open and remove the cartridge. Use another cartridge.

Figure 3–14: Inserting a Tape Cartridge



Refer to your system software manual for instructions on how to use the tape cartridge, for example, to load software or perform backup.

Note

If a cartridge is new, the drive performs a calibration sequence that takes approximately 30 seconds when the drive receives the first command from the operating system. The yellow light blinks rapidly and irregularly during calibration.

3.1.4.6 Removing a Tape Cartridge

You must unload a tape before you can remove the cartridge from the tape drive. Use the following procedure (see Figure 3–15):

1. Press the Unload button. You can also issue a software comman to unload the cartridge. Refer to your system software manuals for the appropriate command.

   The yellow light blinks slowly, as the tape rewinds and unloads into the cartridge. This may take up to 90 seconds.

2. When the yellow light goes off and the green light comes on (you also hear a beep), pull the handle open.

CAUTION

Move the handle only when the yellow indicator light is off and the green indicator light is on. Moving the handle while the yellow light is blinking could damage the drive.

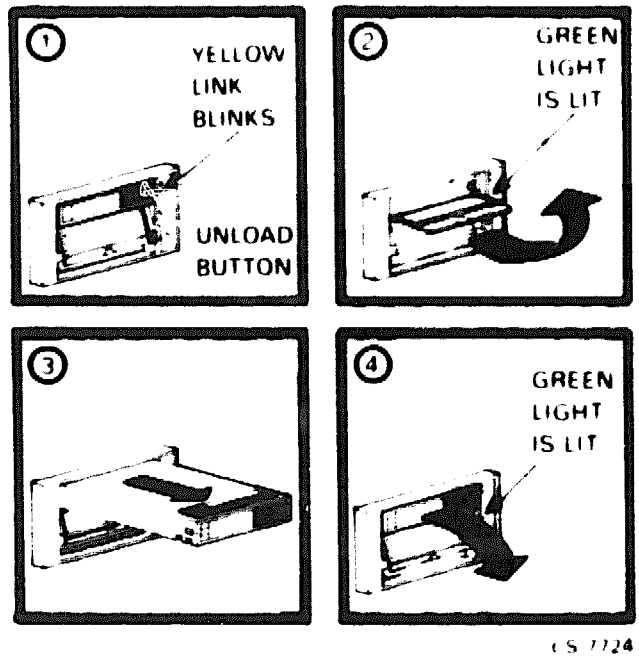
3. Remove the tape cartridge and store it in its container.
4. Push the handle closed.

The green light remains on, indicating that there is power to the drive and that you can safely move the handle.

CAUTION

Remove the tape cartridge from the tape drive when the cartridge is not in use or before you turn off the system. Failure to remove the cartridge may damage the tape cartridge.

Figure 3–15: Removing a Tape Cartridge



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3.1.4.7 Summary of TK70 Tape Drive Controls and Indicator Lights

Table 3–5 summarizes the TK70 tape drive controls. Table 3–6 describes the meaning of the indicator lights.

Table 3–5: TK70 Controls

Control	Position	Function
Handle	Open	Lets you insert or remove a tape after rewind and unload operations are completed.
	Closed	Locks tape in operating position and begins load sequence.
Unload button	Momentary contact switch	Rewinds and unloads the tape.

Table 3–6: TK70 Indicator Lights

Orange	Yellow	Green	Condition
Off	Off	Off	No power to the tape drive.
Off	Off	On steadily	Safe to move cartridge release handle. Power is present.
Off	Off	Blinking	Load fault. The cartridge leader may be defective. Pull out the handle and remove the cartridge. Do not use the cartridge.
On/Off	On steadily	Off	Tape is loaded but not in motion.
On/Off	Blinking	Off	Tape is in motion.
On	On steadily/ blinking	On	Cartridge is write-protected.

Table 3–6 (Cont.): TK70 Indicator Lights

Orange	Yellow	Green	Condition
Blinking	Blinking	Blinking	A fault is occurring. Press the Unload button to unload the tape cartridge. If the fault is cleared, the yellow light blinks while the tape rewinds. When the green light comes on, you can move the handle to remove the cartridge. If the fault is not cleared, all three lights continue to blink. Do not attempt to remove the tape cartridge. Call your Digital service representative.

3.2 Communications Controller Options

The following types of communications controllers are available:

- Asynchronous serial controllers (with or without modem support)
- Synchronous serial controllers (with or without modem support)
- Network controllers

3.2.1 Asynchronous Serial Controllers

The following asynchronous controllers are available, with and without modem support.

- CXA16
- CXB16
- CXY08
- DFA01
- DSRVB

3.2.1.1 Without Modem Support

Before using any peripheral device connected to a serial communications controller, check the following:

- Make sure the peripheral device is properly connected to the system.
- Make sure the peripheral device is properly installed, plugged into an appropriate power source, and turned on.
- Make sure the peripheral device is properly set up. Set-up involves choosing how the device operates. Some set-up choices are matters of personal choice; for example, the number of columns that display on a terminal screen. Others, like baud rate (a measure of the speed at which data is transmitted over a data line), must match the system setting if the peripheral device and system are to communicate.

  You choose set-up options from a series of menus that display when you press the Set-Up key on the terminal keyboard. Set-up instructions for terminals vary according to model, or, in some cases, according to which read-only memory (ROM) cartridge is installed in your terminal. Be sure to read the documentation provided with your terminal.

While most default settings are acceptable, you should perform the set-up procedure for your terminal to ensure appropriate set-up values. The two examples below provide set-up instructions for VT300-series and VT200-series terminals:

For VT300-series terminals:

1. Press [Set-Up] to display the Set-Up Directory screen.
2. Use the arrow keys to select the "Communications Set-Up" option and press [Enter].
3. Make sure the "Transmit Speed" option in the "Current Setting" column is set to 9600. Use the left and right arrow keys to change the setting.
4. Make sure the "Receive Speed" option in the "Current Setting" column is set to "receive=transmit." Use the down arrow to move the cursor to this option, and the left and right arrows to change the setting.
5. Press [Select] to return to the Set-Up Directory screen.
6. Use the arrow keys to select the "Global Set-Up" option and press [Enter].
7. Select the option "Comm Port".
8. If the port in the "Current Setting" column is selected for "RS–232", press [Enter] to select the "DEC–423" port.
9. Press [Select] to return to the Set-Up Directory screen.
10. Use the arrow keys to select the "Save Current Settings" option. Press [Enter] to save all current settings; then press [Set-Up] to exit the Set-Up Directory.

For VT200-series terminals:

1. Press [Set-Up] to display the Set-Up Directory screen.
2. Use the arrow keys to select the "Default" option and press [Enter]. Default correctly sets all values except transmit speed.
3. Use the arrow keys to select the "Comm" option and press [Enter] to display the Communications Set-Up menu.
4. Use the arrow keys to select the "Transmit" option and, using [Enter], set the speed to 9600.

5. Use the arrow keys to select the "To Directory" option and press Enter.

6. Use the arrow keys to select the "Save" option and press Enter; this option stores the set-up values. Then press Set-Up to exit the Set-Up Directory.

Your operating system may have other requirements for using serial communications devices. Refer to your system software manual.

3.2.1.2 With Modem Support

Using serial devices with modem support requires that you install two modems: one connected to the system and one connected to the remote terminal. Both must be connected to phone lines.

Before using modems with your system, check the following:

- Make sure each modem is connected to the system.
- Make sure the modem is properly installed and connected to a phone jack.
- Set controls on the modem according to instructions in the modem user's guide.

Before using the modem connected to the remote terminal, check the following:

- Make sure the modem is properly installed and connected to a phone jack.
- Set controls on the modem according to instructions in the modem user's guide.
- Check the settings on the terminal attached to the modem. Depending on the type of modem and the type of lines used, the baud rate may be 300, 1200, or 2400. Other settings should be the same as those described in the previous section.

Before using a line with modem support, you must set certain parameters such as line speed. See your system software manuals for details.

3.2.2 Synchronous Controllers

The following synchronous controllers are available:

- DPV11—Single-line programmable controller
- DSV11—Dual-line controller
- KMV1A—Programmable communications interface, Q-bus controller

Before using a synchronous controller you must verify the following:

- The system you want to communicate with has an appropriate synchronous controller. Synchronous communications require a synchronous controller on both the transmitting and receiving system.
- Both the transmitting and receiving systems must have supporting host software installed. Synchronous communications operate under specific protocols that define how data is interpreted. Two common protocols are X.25 and PSI. Appropriate host software is required to interpret the protocol.

3.2.3 Network Controllers

Note

The BA212 Rackmount 3400/3800 Systems contain an Ethernet controller on the CPU module. This section is pertinent only if you require use of a second Ethernet controller with your system.

Before using a network controller you must do the following:

- Make sure the Ethernet cable (either standard transceiver cable or ThinWire cable) is connected to the CPU cover panel. The light next to the connector should be lit, indicating an active connection. If it is not lit, move the Ethernet connector switch to the proper position.
- Make sure the Ethernet cable is properly connected to the network. A transceiver cable can be connected in one of the following ways:

  To an H4000 transceiver located on a traditional Ethernet

  To a Local Network Interconnect (DELNI), which can be connected to a larger Ethernet or can serve to connect up to eight systems in a local area network.

A ThinWire cable can be connected as follows:

To a ThinWire Ethernet Multiport Repeater (DEMPR) or ThinWire Singleport Repeater (DESPR), which can be connected to a larger Ethernet or can serve to connect may systems in a local area network

To an available connection on a T connector of other ThinWire nodes.

- Have the DECnet application installed on your system.
- Register your node with the network manager so that your node is recognized by other systems in the network.

Some software products, for example, Local Area VAXcluster (LAVc) software, use the Ethernet hardware address of other systems to operate properly.

The hardware address of your Ethernet device is printed on the label on the bottom half of the CPU module.

You can also use the command SHOW EITHER from console I/O mode. The hardware address of your Ethernet device displays on the terminal, as shown in the following example:

```
>>>SHOW ETHER

08-00-2B-03-50-5C
```

Refer to your software manuals and DECnet manuals for other requirements and further instructions on using a network connection.

3.3 Real-Time Options

- DRQ3B—High-speed interface with two unidirectional 16-bit data channels
- DRV1W—General purpose interface with one 16-bit input port, one 16-bit output port
- IEQ11—DMA controller that connects a Q-bus to two independent buses
- IBQ01—DMS controller that connects a Q-bus to RS–485 control
- AAV11–S—Digital-to-analog converter with DMA capability
- ADV11–S—Analog-to-digital converter with DMA capability
- KWV11–S—Programmable clock that can count from one to five frequencies
- AXV11—Input/output circuit board for analog devices
- ADQ32—Analog-to-digital converter with DMA capability

Before using a real-time controller, make sure the devices connected to the controller are properly set up. Refer to the documentation for the real-time device.

3.4 Printer Options

Before using a printer, make sure it is properly set up and passes any self-tests. Verify that the printer is connected to an appropriate controller. Some printers, such as the LG01 and LG02, require the LPV11-SA interface. Other printers require modem control signals. Consult your printer documentation for the interface requirements.

The systems have several printer options available. Consult the technical information section of the customer kit for a list of printers and printer interface requirements.

3.5 Adding New Options

If you have available slots, you may be able to add new modules to your system. Possible limitations to adding new modules include the following:

- Power limitations
- Physical space limitations
- Bus limitations (ac/dc loading)

Your Digital sales representative can advise you about modules available for your system and what you need to order. A Digital service representative should perform the installation, since the system must be properly configured to work correctly.

CAUTION

Do not attempt to remove, rearrange, or install new modules. Contact a Digital service representative for assistance. If you want to perform maintenance on your system, purchase the *MicroVAX 3400 and MicroVAX 3800 Systems Maintenance Update*.


APPENDIX A

Appendix A
Related Documentation

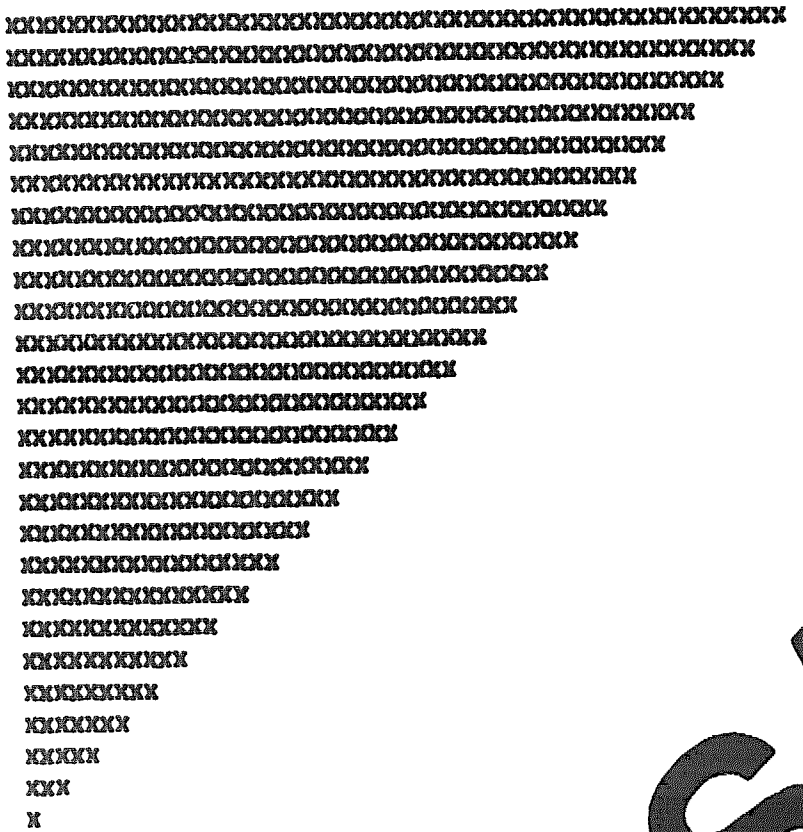
Table A–1: Related Documentation

Document	Order Number
Hardware Documentation	
BA212 Rackmount 3400/3800 System Installation	EK-MVX3R-IN
KA640 CPU Systems Maintenance	EK–179AA–MG
KA640–AA CPU Module Technical Manual	EK–KA640–TM
KA655 CPU Module Technical Manual	EK-KA655-TM
KA655 CPU System Maintenance	EK-306AA-MG
MicroVAX/VAXserver 3400 Technical Information	EK-163AA-IS
Software Documentation	
Overview of VMS Documentation	AA–LA95A–T
VAXELN Host System Guide	AA–JG87B–T
VAXELN Run-Time Facilities Guide	AA–JM81B–T
MicroVAX Troubleshooting and Diagnostics	EK-O19AE-SG

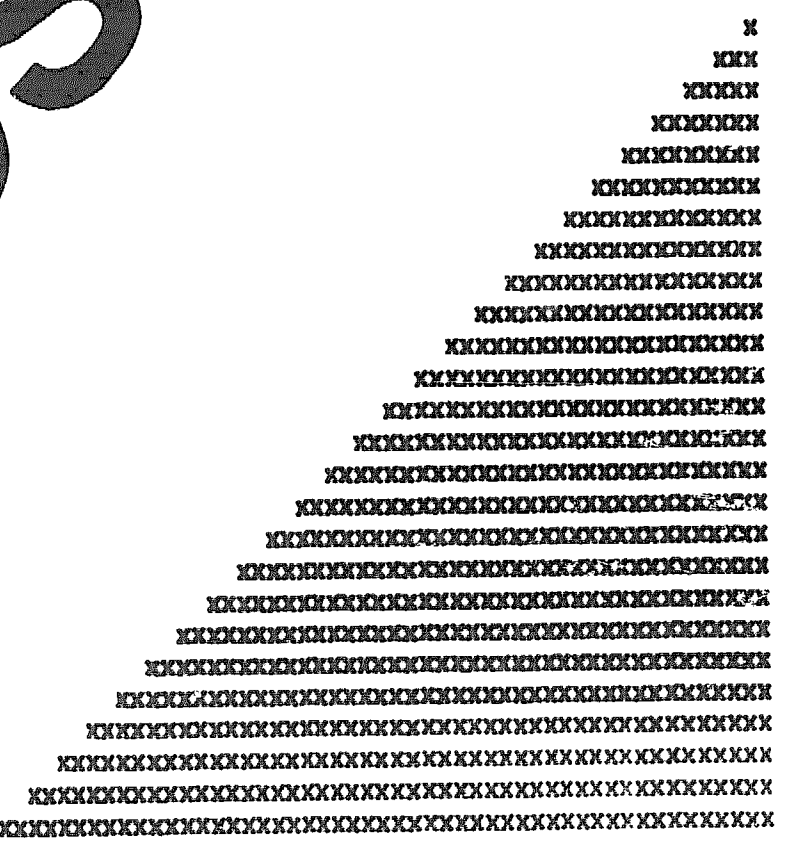
Table A–1 (Cont.): Related Documentation

Document	Order Number
Microcomputer Handbook Series	
VA . Architecture Handbook	EB–19580–20
VAX Soft are Handbook	EB–21812–20
Microcomputer Interfaces Handbook	EB–20175–20
Microcomputers and Memories Handbook	EB–184[illegible]1–20

Documentation specific to supported options is listed with the option in the technical information section of the customer kit.



GLOSSARY



Glossary

Application program

A program designed to meet specific user needs, such as a program that monitors a manufacturing process.

Backplane

1. The connector block that printed circuit boards plug into.
2. A printed circuit board containing the bus.

Back up

The process of making copies of the data stored in your disk drive(s) so that you can recover that data after an accidental loss. You make these copies on a tape cartridge and then store it in a safe place.

Backup copy

A duplicate copy of data on your fixed disk that is stored on a tape cartridge.

Baud rate

The speed at which signals are transmitted serially along a communication line. One baud equals one bit per second.

Binary

A number system that uses only two digits: 0 and 1. These digits are usually represented in circuitry by two voltage levels.

Bit

A binary digit, the smallest unit of information in a binary system of notation, designated as a 0 or a 1.

Boot

To use a bootstrap program to start a computer system.

Bootable medium

A fixed disk or magnetic tape containing software (such as an operating system) that the bootstrap program can load into the system memory.

Bootstrap

A program that you start when you turn on the system. The bootstrap loads software contained on a fixed disk or magnetic tape cartridge into memory. The system then stops executing the bootstrap and starts executing the software in memory. The software usually loads an operating system or other software into memory, so that the system can start processing.

Bug

An error in the design or implementation of hardware or software system components.

Bus

A printed circuit board that is part of the backplane. The bus permits communications among the other printed circuit boards.

Byte

A group of eight binary digits (bits). A byte is one-half the size of a word and one-quarter the size of a longword.

Central processing unit (CPU)

The part of a computer system that controls the interpretation and execution of instructions.

Command

An order given by a user to a computer, often through a terminal keyboard.

Communication line

A cable along which electrical signals are transmitted. Systems or devices connected by communication lines can share information and resources.

Computer system

A combination of computer hardware, software, and external devices that performs specific operations or tasks.

Console terminal

The terminal you use when installing software and running diagnostic programs.

Controller

A component that regulates the operation of one or more peripheral devices. Controllers are often called interface units.

CPU

See *Central processing unit*.

Data

A representation of facts, concepts, or instructions, suitable for communication, interpretation, or processing by human beings or by machines.

Data transmission

The movement of data, in the form of electrical signals, along a communication line.

Debug

To detect, locate, and correct errors (bugs) in system hardware or software.

Device

The general name for any entity connected to a system that is capable of receiving, storing, or transmitting data.

Device name

The name by which a device or controller is identified within a system. You use the device name to refer to that device when communicating with the system.

Diagnostic program

A program that detects and identifies abnormal hardware operation. The MicroVAX Diagnostic Monitor software contains several diagnostic programs.

Disk

A flat circular plate with a coating on which data is stored magnetically in concentric circles (tracks).

Disk drive

A device that contains a fixed disk or one or more diskettes. The drive contains mechanical components that spin the disk or diskettes and move the read/write heads that store and read information on the surface of the disk or diskettes.

EIA

Electronic Industries Association.

Error message

A message displayed by the system to indicate it has detected an error or malfunction.

File

A collection of related information treated by the computer as a single item.

Firmware

Software instructions stored in a fixed form, usually in read-only memory (ROM). The power-on self-tests and bootstrap program are firmware.

Formatted data

Data laid out in a particular pattern to conform to a predetermined structure. The structure is dictated by the system software.

Hardware

The physical components—mechanical and electrical—that make up a computer system. Compare *Software*.

Head

The part of a ISE, diskette drive, or tape drive that reads, records, and erases data. Also called read/write head.

Input device

A piece of equipment used to transfer data into the computer. A keyboard is an input device.

Input/Output (I/O) device

A piece of equipment that accepts data for transmission both to and from a computer. A terminal is an input/output device.

Interactive

The method of communicating with a computer system. You type a command at the keyboard, the system executes the command, and then responds with a message or prompts for another command.

Interface

A device or piece of software that lets different components of a computer communicate with one another.

I/O

Abbreviation for input/output.

Kbyte

1024 bytes.

LED

Light-emitting diode. A LED on the CPU cover panel displays a hexadecimal countdown during the power-on sequence.

Load

1. To move software, usually from a peripheral device into memory.
2. To place a disk in a disk drive, or tape in a tape drive.

Longword

A group of 32 bits, equal to two words or four bytes.

Magnetic tape

A long strip of plastic coated with magnetic oxide, used for storing data. Often called magtape. The tape contained in a tape cartridge.

Mbyte

1,048,576 bytes.

Memory

The area where a computer finds the instructions and data it will process.

Menu

A displayed list of options. The list usually contains commands you can enter.

Off-line

Pertaining to equipment, devices, and events that are not under direct control of the computer system.

Operating system

A collection of programs that controls the overall operation of a computer and performs such tasks as:

- Assigning places in memory to programs and data
- Processing requests, scheduling jobs
- Controlling the operation of input and output devices

Output device

A device by means of which data can be extracted from a computer system; for example, a printer.

Peripheral device

Any device distinct from the central processing unit that provides it with additional memory storage or communication capability. Examples are disk and diskette drives, video terminals, and printers.

Power-on sequence

A series of ordered events that occurs when you supply power to a system by turning it on.

Printer

A peripheral device that provides paper copies of information stored in a computer.

Program

The complete sequence of instructions necessary for a computer to perform a task. See *Software*.

Prompt

A character or words that a computer displays to indicate it is waiting for you to type a command

Read-only memory (ROM)

A memory that does not allow modification of its contents. The computer can use data in a ROM but cannot change it.

Reboot

To restart a computer system. Pressing the Reset button reboots the system.

Record

A set of related data that a program can treat as a unit. A file consists of a number of records.

ROM

See *Read-only memory*.

Run

1. A single continuous execution of a program.
2. To execute a program.

Software

Programs executed by a computer system to perform a chosen or required function. Compare *Hardware*.

Software package

A set of related programs that performs a specific task.

Storage medium

Any device capable of recording information, for example, a tape cartridge.

Store

To enter data into a storage device, such as a disk, or into memory.

System

A combination of computer hardware and software and external devices that performs specific processing operations.

System management

Tasks performed by the operating system to control the overall operation of the computer system.

Terminal

An input/output device generally used for communication between the users of a computer system and the system itself.

Video terminal

A terminal that displays information on the screen of a cathode ray tube (CRT).

Word

A word is 16 bits long.

Write-protect

To protect a disk, diskette, or other storage medium against the addition, revision, or deletion of information.