

VAX 4000 Model 200 (BA215) Installation

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Preface

This manual tells you how to install your system, using the following steps.

1. Verify site preparation
2. Check the shipment
3. Position the system
4. Install the console terminal
5. Set the system controls
6. Connect additional devices to the system
7. Connect the DSSI cable — dual host only
8. Connect the system power cable
9. Turn on the system and select a language
10. Attach the front panel

If you are installing a dual-host system, you must repeat each step for each host. For more information on dual-host systems, refer to your system *Operation* manual and to *VAX 4000 Dual-Host Systems*.

A glossary in your system *Operation* manual will help you understand new words and abbreviations that appear in this manual.

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

NOTE: *Some of the devices mentioned in this manual are designed for timesharing systems and may not be suitable for server systems. If you have a server system, contact your Digital representative if you have any questions about whether a device is appropriate for your system.*

Conventions

The following conventions are used in this manual.

Convention	Meaning
Key	A terminal key used in text and examples. For example, Break indicates that you press the Break key on your terminal keyboard.
XXXX Return	Bold, monospaced type and the symbol for the Return key indicate interactive input that you must supply. For example: >>> BOOT MUA0 Return That line tells you to enter the command BOOT MUA0 at the console terminal.
NOTE	Provides general information about the current topic.
CAUTION	Provides information to prevent damage to equipment or software.
WARNING	Provides information to prevent personal injury.

The following warning symbols appear on the power supply. Please review their meaning:



Indicates risk of electric shock.



To reduce the risk of injury, do not remove modules, Integrated Storage Elements (ISEs), or the power supply. No user-serviceable parts are inside. Refer servicing questions to your Digital service representative or your qualified self-maintenance personnel.

The equipment is not designed for connection to an IT power system (a power system without a directly grounded neutral conductor). The equipment should be plugged into a dedicated (isolated) ground circuit.

1 Verify Site Preparation

You may have received a copy of the system *Site Preparation* manual, which describes the physical, environmental, and electrical requirements for your system. A copy of that manual is also included in your Customer Hardware Information Kit. If you have not done so, read that manual and follow its instructions for preparing your site.

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

You will need the following tools to install your system. They are not included in your shipment.

- Scissors
- Phillips (cross point) screwdriver
- Adjustable wrench

If you are installing a dual-host system, you must repeat each step in the installation procedure for each host.

2 Check the Shipment

Before unpacking your system, find the Product Delivery Document. It is attached to the outside of a carton and is labeled with a blue "i" symbol. That document lists your order and how it breaks out into the items shipped.

Your shipment may include several cartons:

- One carton contains the system.
- A smaller carton contains the console terminal, if ordered.
- Another carton contains hardware documentation, software documentation, and software licenses. That carton also contains system software and diagnostic software if you ordered those items separately.

Depending on your order, your shipment may also include cartons containing:

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

Make sure your shipment is complete by checking that each item listed as shipped on the Product Delivery Document appears on a Content Listing or on a barcode label on the outside of one of the cartons in your shipment.

NOTE: *Save all packing materials until you are sure you will not reship any items in the shipment. And save all items in the shipment until you are sure you will not use them.*

Use the unpacking illustrations on the cartons as a guide to unpack your shipment, one carton at a time. Check the contents of each carton against the Content Listing on its side to ensure you received all items.

Release the shipping brackets according to the instructions on the yellow label attached to the front of the system. Then remove the yellow label.

WARNING: *The system weighs 38.5 kilograms (85 pounds) with all options installed. Two or more people should move the system.*

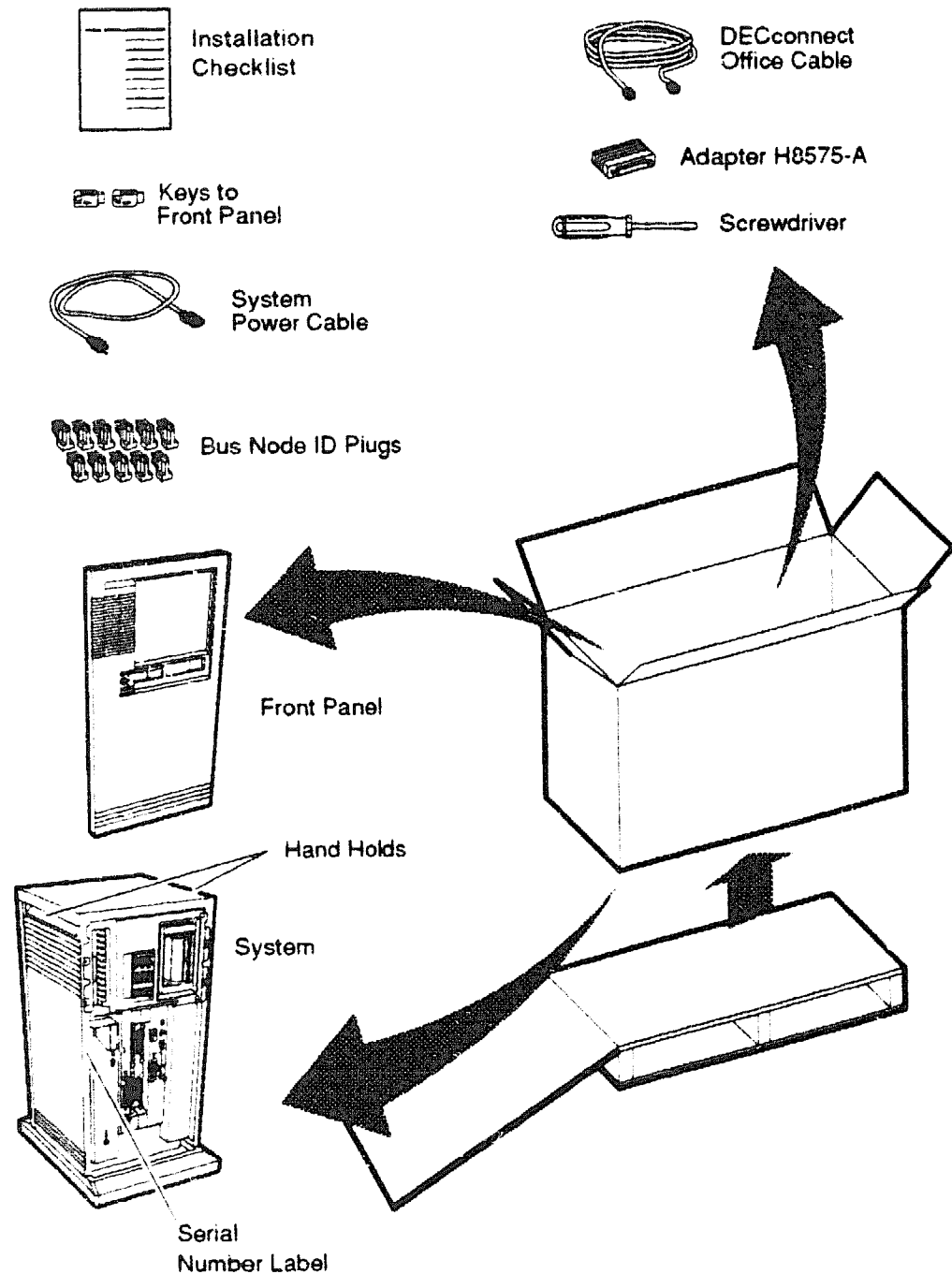
If any item is missing or damaged:

- Contact your delivery agent.
- Contact your Digital sales representative.

If you ordered a dual-host system, the carton containing the second system includes the same items as the first carton plus a BC21M-09 DSSI cable. DSSI stands for Digital Storage Systems Interconnect.

Figure 1 shows the contents of the shipping carton.

Figure 1: Shipping Carton Contents



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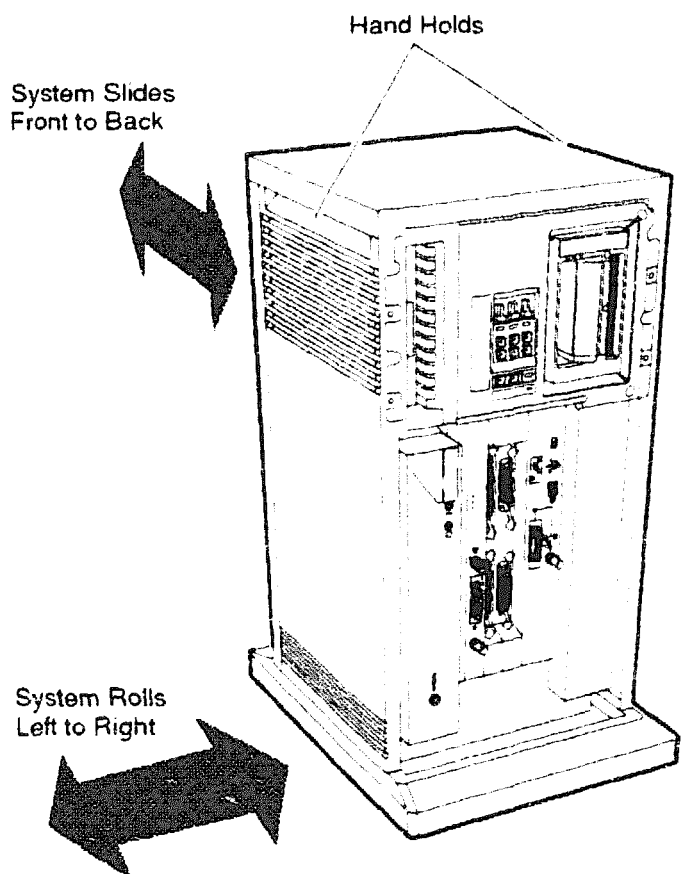
CAUTION: *Before continuing the installation, verify that your system power requirements match your power source. The correct voltage for the system is listed on the serial number label next to the power supply (see Figure 1).*

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

3 Position the System

You can move your system into position in one of two ways as shown in Figure 2.

Figure 2: Sliding the System Into Position



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WARNING: *Do not use the hand holds to lift the system.*

- Roll it sideways.
- Slide or walk it backward or forward by gripping the hand holds on the side.

Leave space behind the system for routing cables. Once installation is complete, you can place the system base directly against a wall. The oversized base ensures enough space for proper ventilation.

The next step in installing your system is to install the console terminal.

4 Install the Console Terminal

You will use the console terminal to communicate with your system.

1. Unpack the terminal and its documentation.
2. Use the instructions in the terminal installation guide to connect the various parts of the terminal.
3. Turn on the terminal.

The terminal performs a self-test. The documentation for the terminal describes a successful self-test and error messages you receive if the terminal is not operating properly.

Once the terminal passes its self-test, you are ready to perform setup operations.

4.1 Perform Setup Operations

Setup instructions for terminals vary according to model or according to which read-only memory (ROM) is installed in the terminal. Be sure to:

- Read the documentation provided with your terminal.
- Follow the setup instructions for your terminal.

NOTE: *A new terminal from Digital has the baud rate set to 9600. If your terminal is new and you want to use that rate, you can skip the baud rate setup instructions.*

If you have a dual-host system, you can use one terminal with dual sessions instead of two terminals. See your terminal documentation for instructions.

Once you test the terminal and perform setup operations, you are ready to connect the terminal to your system.

4.2 Connect the Terminal to the System

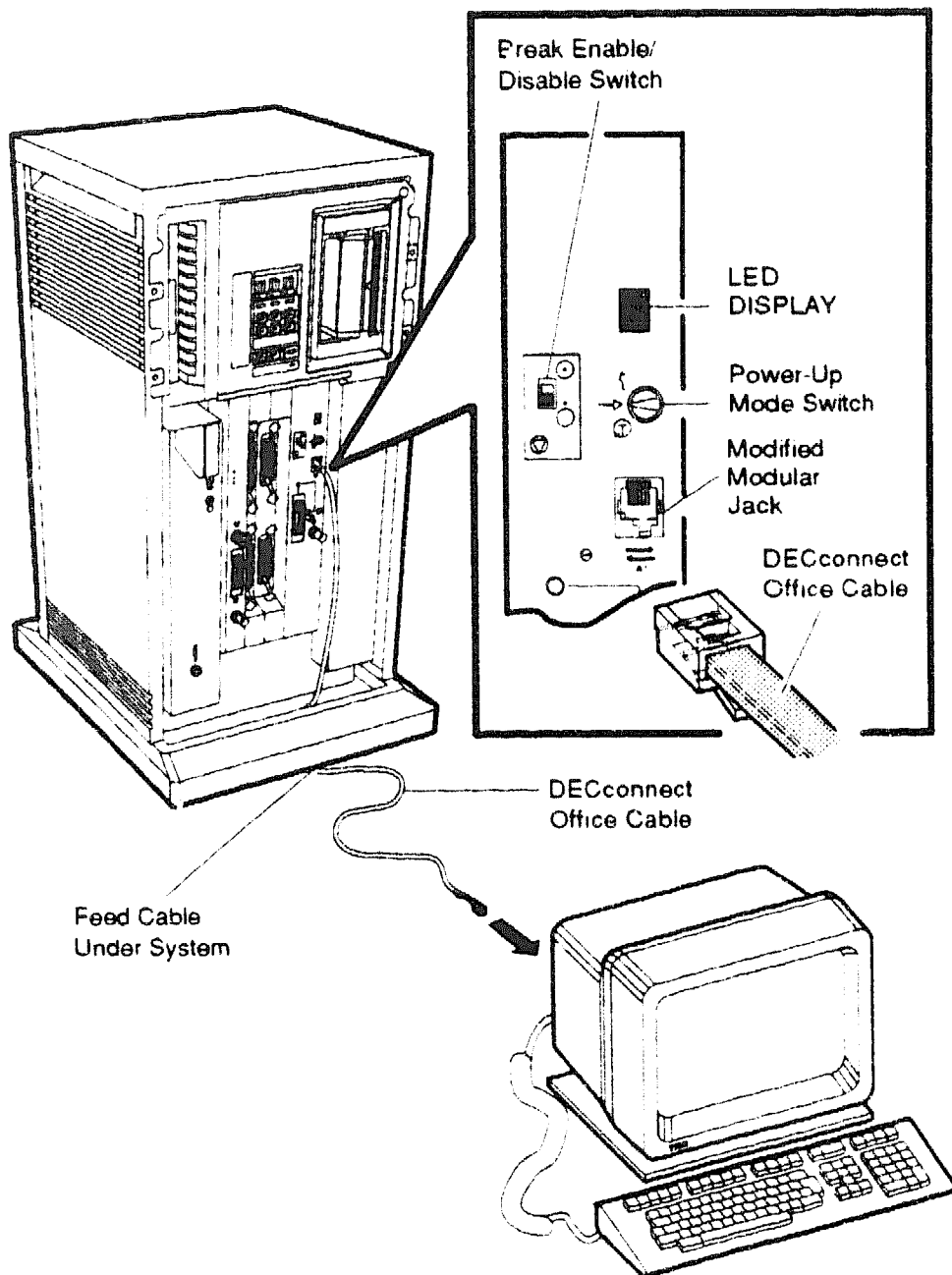
You will attach one end of a cable to the CPU cover panel and the other end of the cable to a communication port on the back of the terminal.

- The CPU cover panel is on the front of the system and covers backplane slots 1 and 2.
- The port on the back of the terminal varies with the type of terminal.

Refer to the instructions that follow to connect a VT300-series or VT400-series terminal.

1. Turn off the terminal.
2. Find the console terminal cable. It is labeled DECconnect Office Cable, has a DEC-423 modular plug on each end, and can be found in the accessories package.
3. Connect the terminal cable to the DEC-423 modular jack labeled 1 on the rear of the terminal, according to the instructions in your terminal installation guide.
4. Feed the other end of the cable under the system base, from behind or from the side. Then draw up the cable and insert it into the modified modular jack shown in Figure 3.

Figure 3: Connecting a VT300-Series or VT400-Series Console Terminal



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

5 Set the System Controls

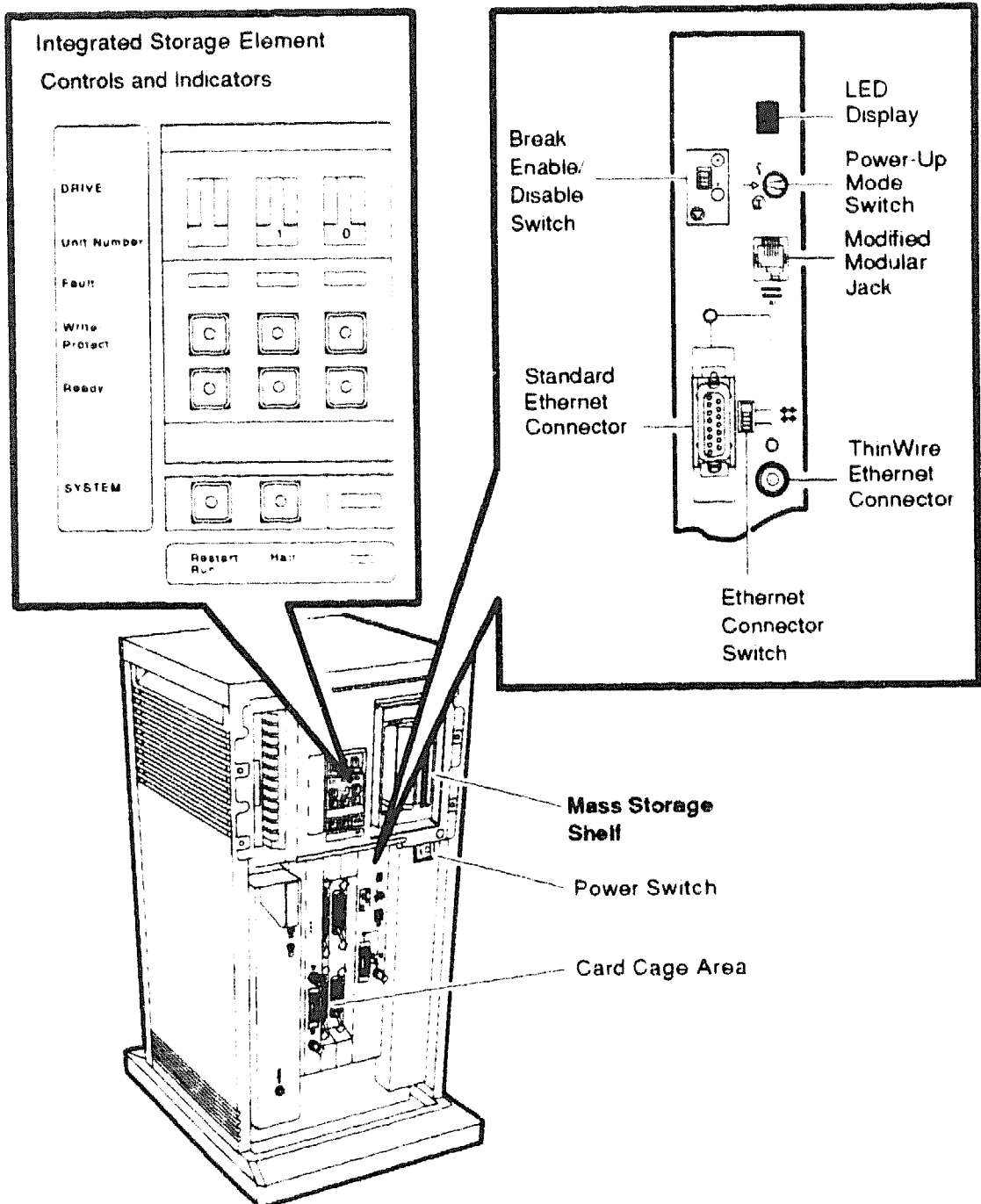
The system controls are on the mass storage shelf and in the card cage area.

1. On the mass storage shelf, check the setting of the Write-Protect button, Ready button, and Halt button shown in Figure 4 and the Cartridge Insert/Release handle shown in Figure 5.
 - Write-Protect button — Make sure that button is in the out (write-enabled) position.
 - Ready button — Make sure that button is in the out (on-line) position.
 - Halt button — Make sure that button is set to the out (run) position.
 - Cartridge Insert/Release handle — If a TK-series tape drive is installed, make sure that handle is closed (pushed in).

Verify that a bus node ID plug is inserted into each Integrated Storage Element (see DRIVE Unit Number in Figure 4).

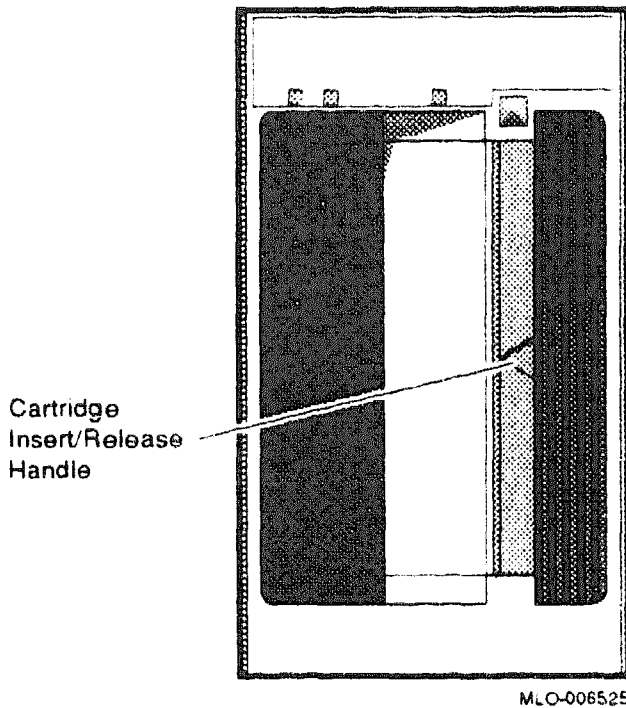
2. In the card cage area, check the setting of the Power switch, Power-Up Mode switch, and Break Enable/Disable switch shown in Figure 4.
 - Power switch — It should be off (set at 0).
 - Power-Up Mode switch — Set that switch to the Language Inquiry mode (uppermost position, indicated by a human profile).
 - Break Enable/Disable switch — Set that switch to break enabled (up, indicated by a dot inside a circle).

Figure 4: System Controls and Indicators — Integrated Storage Elements, System Controls, and CPU Cover Panel



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Figure 5: System Controls and Indicators — TK-Series Tape Drives



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

6 Connect Additional Devices to the System

You can connect additional devices at this time, or you can complete the installation (skip to step 7) before connecting additional devices.

- If you have devices that must be installed before you load system software, install them now.
- Otherwise, skip to step 7 if you prefer to connect additional devices later.

Use the following instructions when you are ready to connect the devices.

CAUTION: *Make sure the Power switch is off (set at 0).*

Make all connections directly to the appropriate module cover.

- Begin with the module at the far right.
- As you complete connections for each module, move left to the next module.

The following numbered sections tell you how to connect each type of device.

To help you make the proper connections, each module cover has an identifying label at the top. That label contains the module number and option number. Table 1 lists the identifying labels for all modules you can use on your system. Use the table to identify the modules as you connect additional devices to your system. Not all modules require additional connections.

Table 1: Module Identification Labels

Module Number	Option Number	Description
CPU and Memory		
M7622-AA	MS650-BA	System memory, 16 megabytes
M7622-BA	MS650-BB	System memory, 8 megabytes
M7626-AA	KA660-AA	System CPU (multiuser)
M7626-BA	KA660-BA	System CPU (server)
M8578-00	MRV11	Programmable read-only memory
Mass Storage		
M5976-SA	KZQSA	TLZ04/RRD-series adapter
M7164, M7165	KDA50	Intelligent board controller (RA-series disks and ESE20)
M7206-PA	TSV05	TS05 tape drive controller (old)
M7530	TSV05	TS05 tape drive controller (new)
M7546-00	TQK50	TK50 tape drive controller
M7552-PA	KRQ50	RRD-series disc drive controller
M7559-00	TQK70	TK70 tape drive controller
M7740-PA	KLESI	RV20 write-once optical disk (or TU81E tape) controller
M7769	KFQSA	DSSI mass-storage adapter
Communications		
M3108-PA	DSV11	2-line synchronous serial interface (full modem support)
M3118-YA	CXA16	16-line asynchronous serial interface (RS-423-A, no modem support)

Table 1 (Cont.): Module Identification Labels

Module Number	Option Number	Description
M3118-YB	CXB16	16-line asynchronous serial interface (RS-422, noise immune)
M3119-YA	CXY08	8-line asynchronous serial interface (full modem support)
M3121-PA	DFA01	2-line asynchronous serial interface with integral modem
M3127-PA	DESQLA	Ethernet adapter
M7500-PA	KMV1A	Programmable data communication interface
M7531-PA	DIV32	ISDN controller
M7651-PA	DRV1W	Real-time parallel interface
M8020-PA	DPV11	Synchronous serial line interface
M8049-PA	DRV1J	Parallel I/O interface, 64-line
Miscellaneous		
A026-PA	AXV11	D/A and A/D converter
A030-PA	AJ/Q32	32-channel, single-ended, or 16-differential-channel analog to digital converter
A1008-PA	ADV11	16-channel, single-ended, or 8-differential-channel analog to digital converter
A1009-PA	AAV11	Digital to analog converter
M3125-PA	IBQ01	BITBUS to Q-bus DMA controller
M4002-PA	KWV11	Programmable real-time clock
M7168, M7168, M7169	VCB02-J	Graphics controller, 8-plane
M7168, M7169	VCB02-K	Graphics controller, 4-plane
M7533-AB	DEQRA	DEC TRNcontroller 100 (token ring adapter)
M7616	KXJ11	J11 CPU, 512-kilobyte RAM, 64-kilobyte programmable read-only memory, Q-bus peripheral processor
M7658-PA	DRQ3B	Real-time parallel interface
M8086-PA	LPV11	Dual parallel printer interface
M8634-PA	IEQ11	IEEE instrument bus DMA controller

Table 1 (Cont.): Module Identification Labels

Module Number	Option Number	Description
M9404, M9405	None	BA21X-SF Q-bus expansion kit

CAUTION: *Do not operate the system without Digital module covers. They are required to protect the equipment and to meet international regulatory standards. Do not substitute other covers as they may not meet the required specifications.*

6.1 Connecting 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 your site was prepared properly, the lines for the additional terminals and printers 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) that has connections for up to eight terminals and printers.
- You then connect the cable concentrator to the system with a BC16D cable.

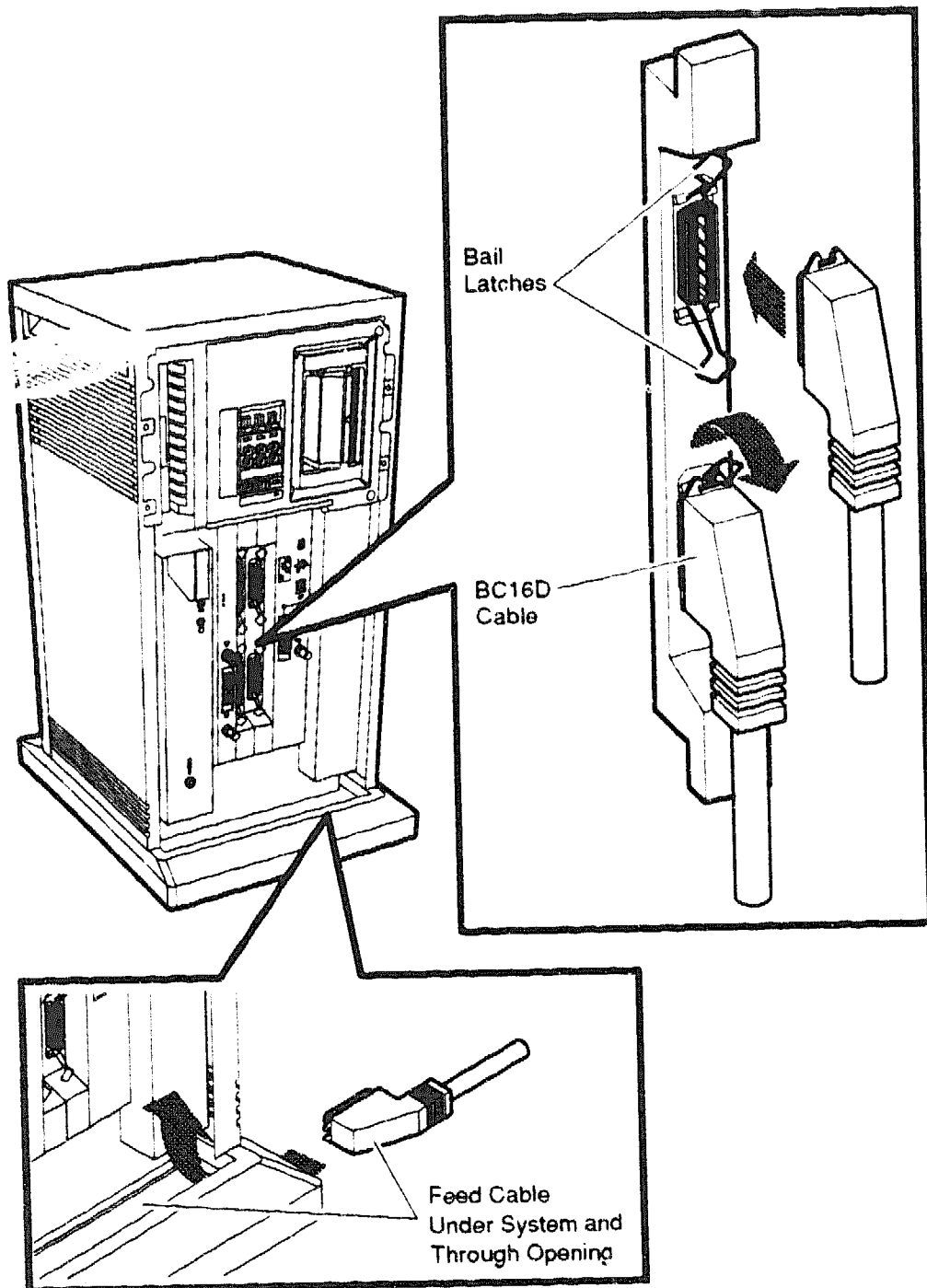
For each CXA16 or CXB16 module, two H3104 cable concentrators and two BC16D cables are shipped with your system.

To connect additional terminals and printers:

1. Find an H3104 cable concentrator and a BC16D cable.
2. Feed one end of the BC16D cable under the system from the back or side and insert it into the connector as shown in Figure 6.
 - If you are connecting two BC16D cables, connect the first to the connector labeled 8–15 on the module cover.
 - If you are connecting one BC16D cable, connect that cable to the connector labeled 0–7.

Lock the connector in place by using the bail latches.

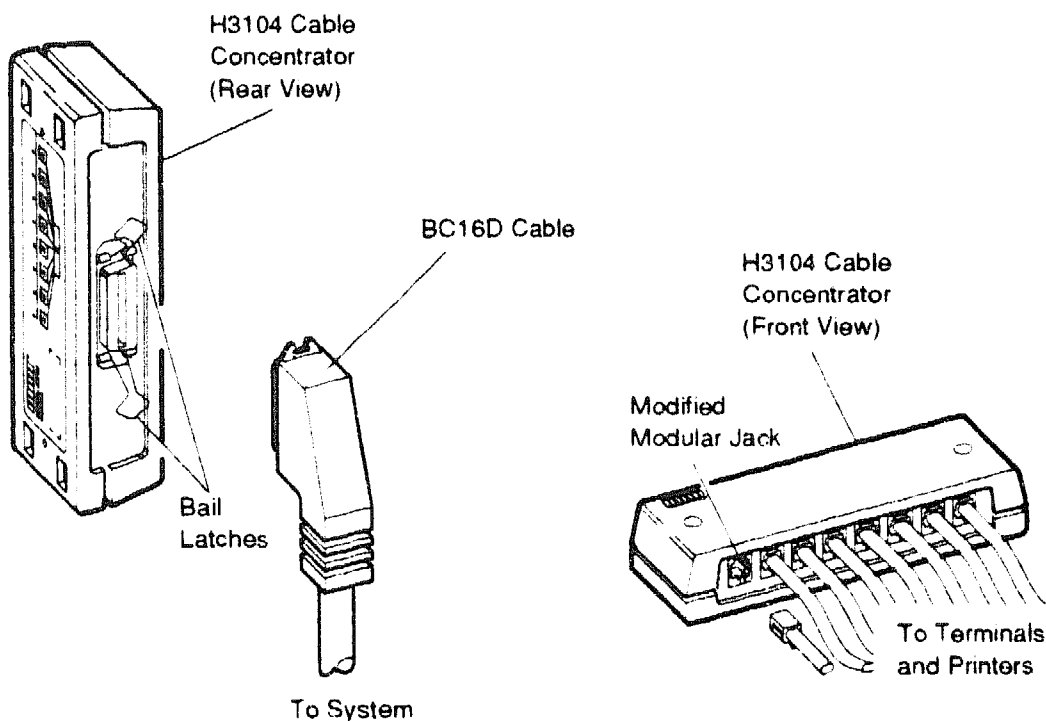
Figure 6: Connecting Devices to the CXA16 Module



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3. Insert the other end of the BC16D cable into the cable concentrator shown in Figure 7. Lock the connector in place by using the bail latches.

Figure 7: Connecting Devices to the Cable Concentrator



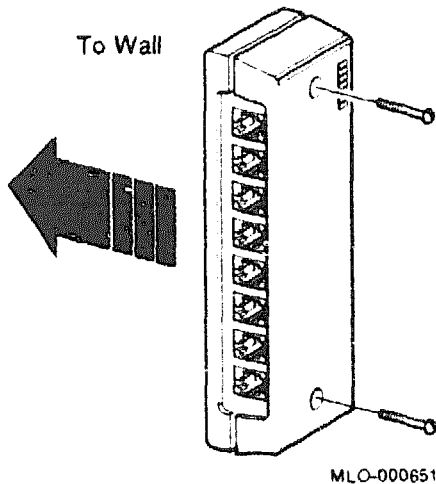
4. Insert each printer and terminal cable into one of the modified modular jacks on the cable concentrator as shown in Figure 7.
5. If you have not done so, connect the terminal or printer to the other end of the cable. Your terminal or printer documentation shows how to connect the cable.

If the printer or terminal does not have a modified modular jack connection, use a passive adapter (H8575-A), available in 25-pin and 9-pin models.

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

You can mount the cable concentrator on a wall. Wall mounting keeps cables off the floor. Use two screws as shown in Figure 8.

Figure 8: Mounting the Cable Concentrator



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

6.2 Connecting Parallel Printers to the System

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

To connect parallel printers to the LPV11 module:

1. Find a BC27L-30 cable.
2. Feed one end of that cable under the system from the back or side. Then insert it into the connector labeled J1 on the module cover. Lock the connector in place by using the bail latches.
3. Insert the other end of the cable into the printer.

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

6.3 Connecting Synchronous Modems to the System

You can connect to a DSV11, DPV11 or KMV1A module.

6.3.1 DSV11 Module

You can connect up to two synchronous modems for each DSV11 module installed in your system.

To connect a synchronous modem to a DSV11 module, using a protocol adapter and extension cable:

1. Feed the socket end of the 0.6-meter (24-inch) adapter cable (BC19-B/D/E/F) under the system from the back or side and connect it to the module. Tighten the two screws on the cable connector using a screwdriver.
2. Connect the extension cable (BC55D, BC22F or BC19L) to the other end of the adapter cable. Secure the cables by tightening the two screws at the connection.
3. Connect the other end of the extension cable to the modem. Refer to your modem documentation for the location of the connector.

6.3.2 DPV11 or KMV1A Module

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

To connect a synchronous modem to a DPV11 or KMV1A module:

1. Find a BC22E or BC22F cable.
2. Feed one end of the cable under the system from the back or side and insert it into the connector on the DPV11 or KMV1A module cover. Lock the connector in place by using the bail latches.
3. Insert the other end of the cable into the modem. Refer to your modem document for the location of the connector.

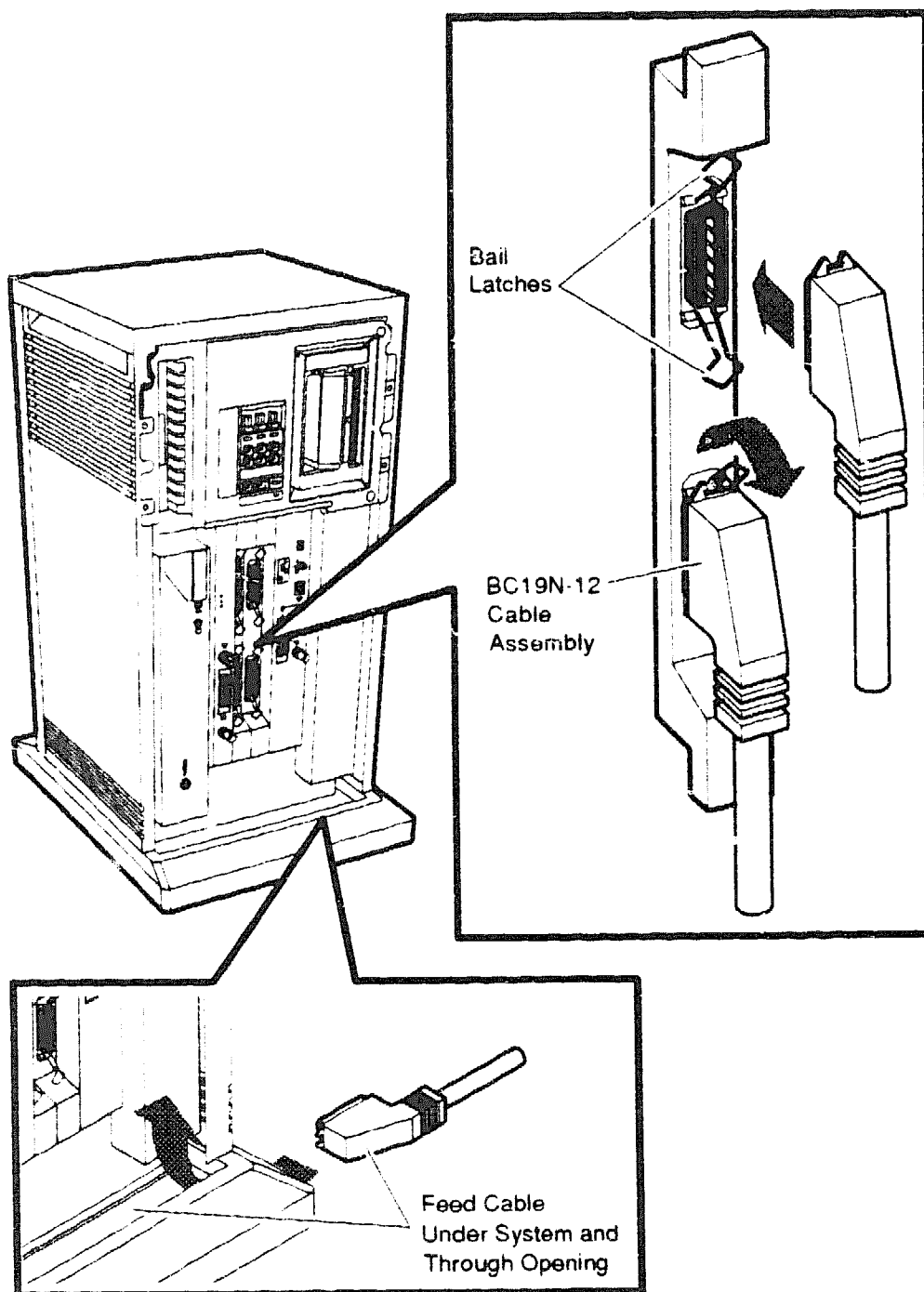
6.4 Connecting Asynchronous Modems to the System

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

To connect a modem to a CXY08 module:

1. Find a BC19N-12 cable.
2. Feed one end of the cable under the system from the back or side and insert it into the connector as shown in Figure 9.

Figure 9: Connecting a Modem to a CXY08 Module



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- If you are connecting two BC19N-12 cables, connect the first to the connector labeled 4-7 on the module cover.
- If you are connecting one cable, connect it to the connector labeled 0-3.

Lock the connector in place with the bail latches.

3. Attach a modem to one of the four connectors at the opposite end of the cable. 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 your modem documentation for the location of the connector.

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

6.5 Connecting an Internal Modem to Telephone Lines

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

6.5.1 DFA01 Modems

The DFA01 module contains two modems, A and B. Each requires its own telephone.

Each DFA01 modem connects to one of the following dial-up telephone services.

- RJ11C (United States) and CA11A (Canada) standard single-line telephone service. The switchpacks are factory set for that service. If you have it, 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 that service. If you have it, 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 it, you have two wall-mounted modular telephone jacks per telephone.

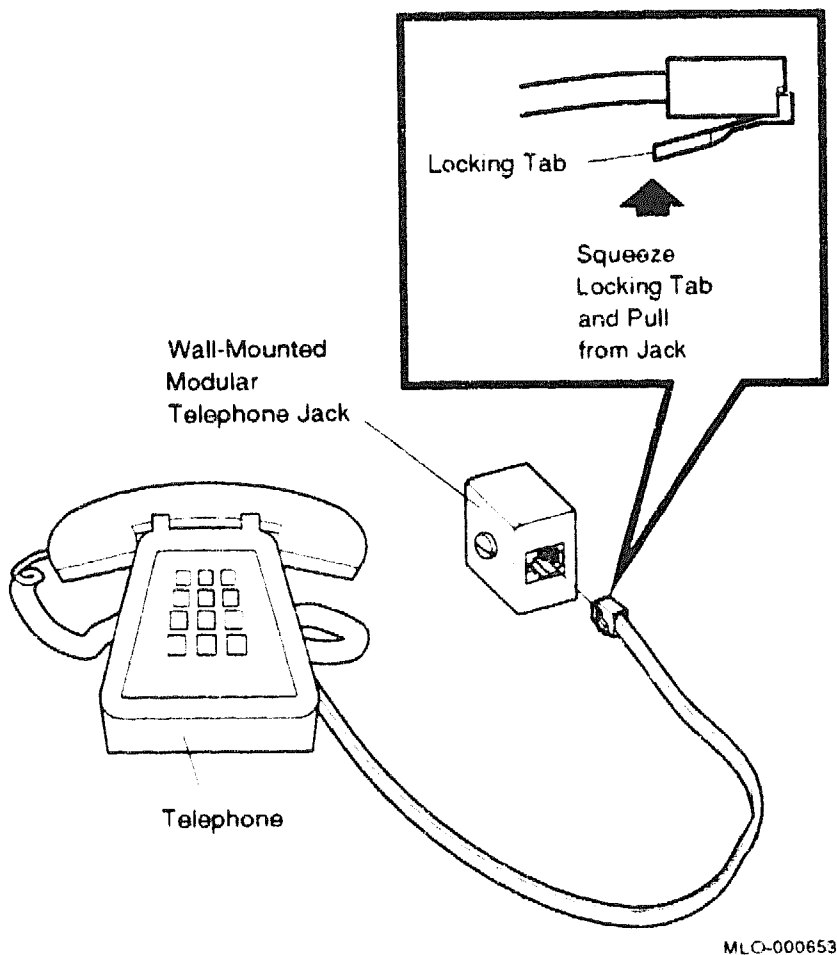
NOTE: *If you do not know which telephone service you are using, call your telephone company.*

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

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

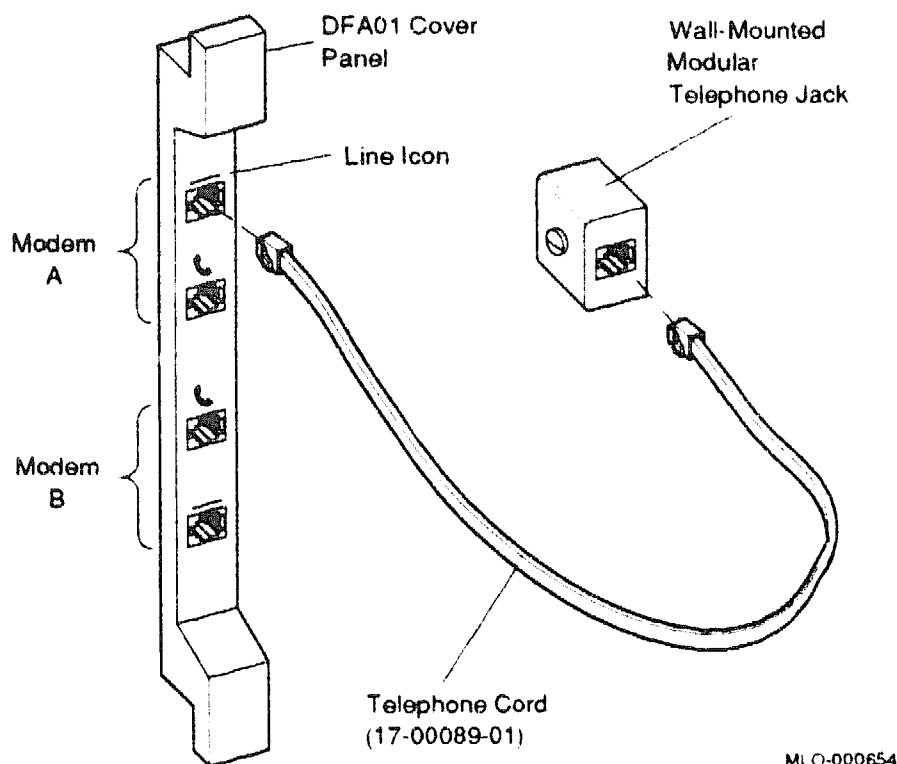
1. Disconnect the telephone line from the wall-mounted modular telephone jack. Leave the other end of the telephone line connected to the telephone as shown in Figure 10.

Figure 10: Disconnecting the Telephone Line — Single Line and Multiline Service



2. Take one end of one of the cords included with the modem (17-00089-01) and insert it into the top jack on the module cover (modem A). The top jack is marked with the line icon as shown in Figure 11.

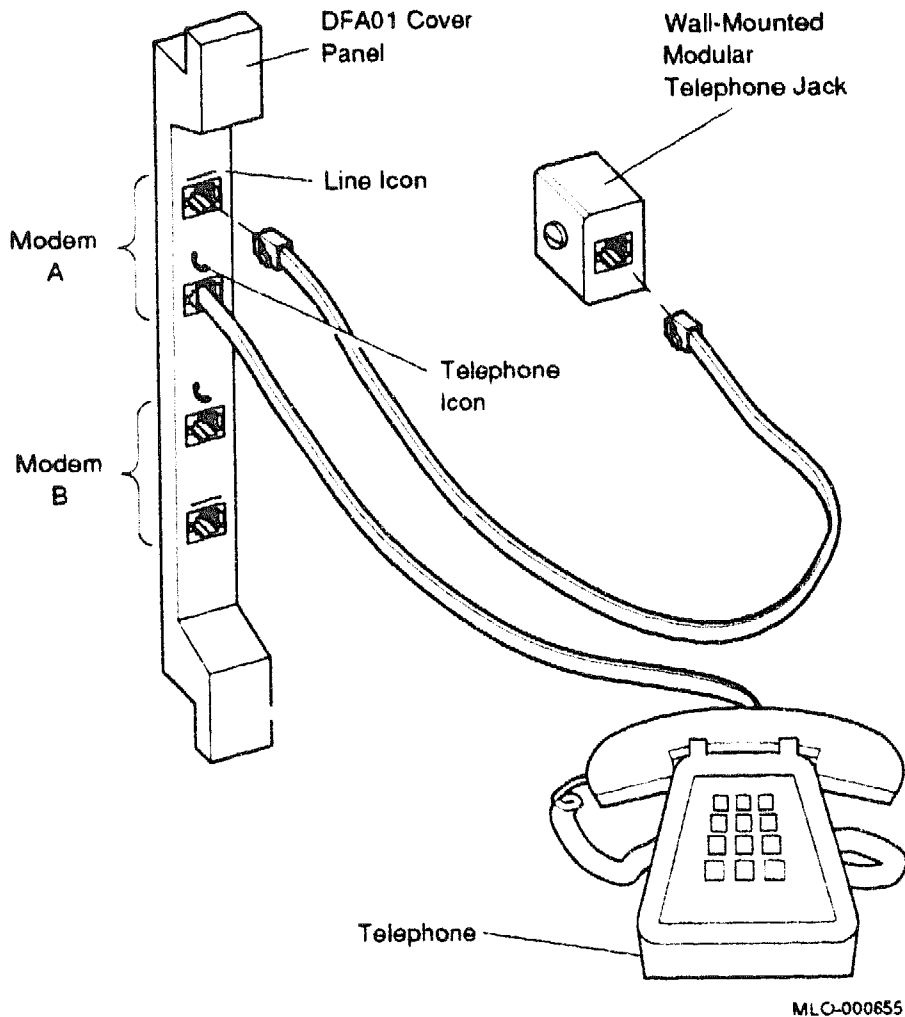
Figure 11: Installing the Telephone Cord — Single Line and Multiline Service



3. Insert the other end of the cord into 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 insert it into the second jack from the top of the module cover as shown in Figure 12. That jack is marked with the telephone icon.

Figure 12: Connecting a Modem to a Telephone — Single Line and Multiline Service



If you do not plan to use modem B, do not perform the following step.

5. Set up modem B by following the same procedure you used to set up modem A. Notice, however, that the jack positions on the module cover

are reversed for modem B. The bottom jack is marked with a line icon; the second jack from the bottom is marked with a telephone icon.

- a. Connect the wall-mounted modular jack to the bottom jack on the module cover.
- b. Connect the telephone line to the second jack from the bottom of the module cover.

6.5.3 RJ41S/CA41A and RJ45S/CA45A Telephone Service

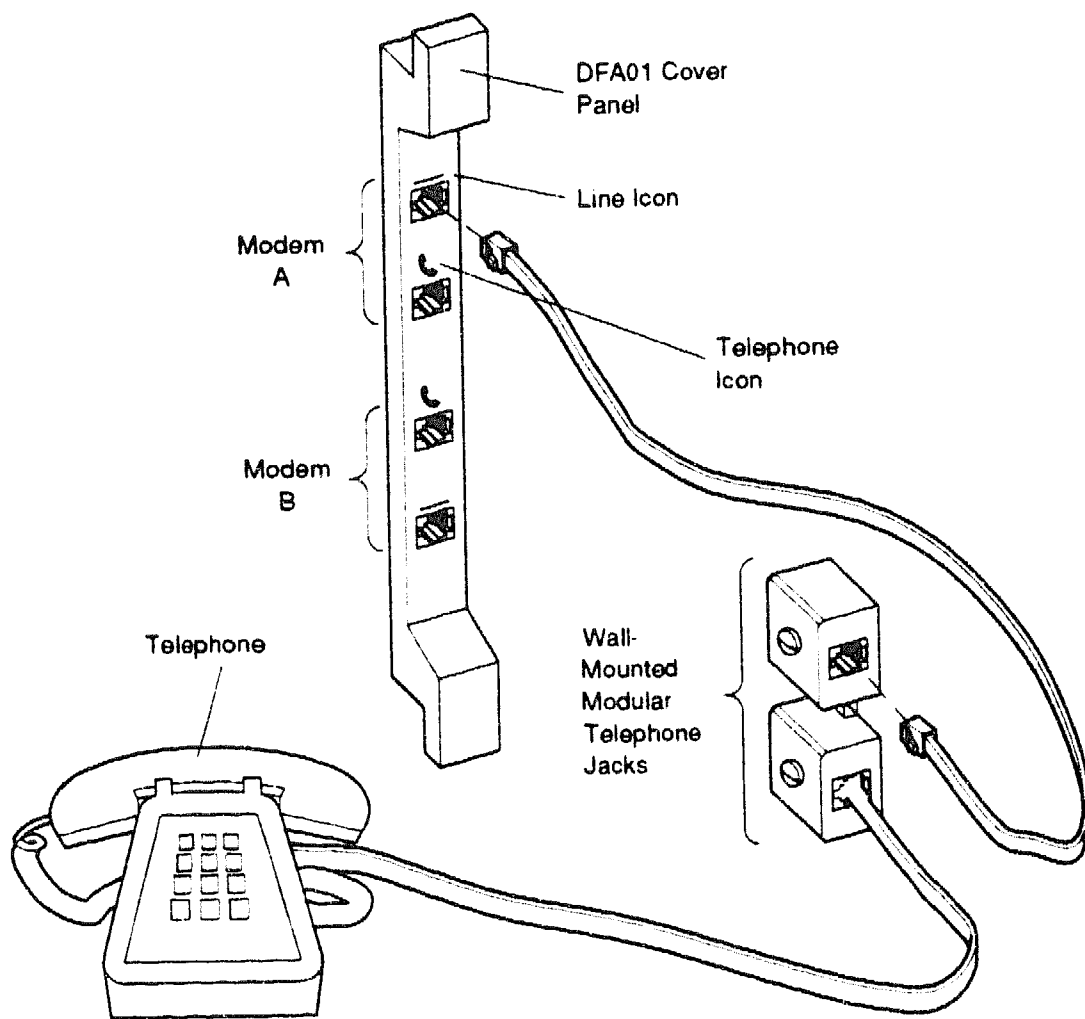
Use the following procedure to connect the DFA01 modem to RJ41S/CA41A or RJ45S/CA45A data-jack telephone service.

- You need a standard eight-wire telephone cord (not supplied with the modem).
- If you plan to use modems A and B, you need two telephones, one for each modem.

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

1. Insert one end of the telephone cord into the top jack on the module cover (modem A) as shown in Figure 13. The top jack is marked with the line icon.

Figure 13: Connecting a Modem to a Wall-Mounted Jack (Data Jack Service) — Telephone to Wall-Jack Connection



2. Insert the other end of the telephone cord into a second wall-mounted modular telephone jack.

If you require voice communication on modem A, refer to step 4.

If you do not plan to use modem B, skip step 3 and proceed with step 4.

3. If you plan to use modem B:

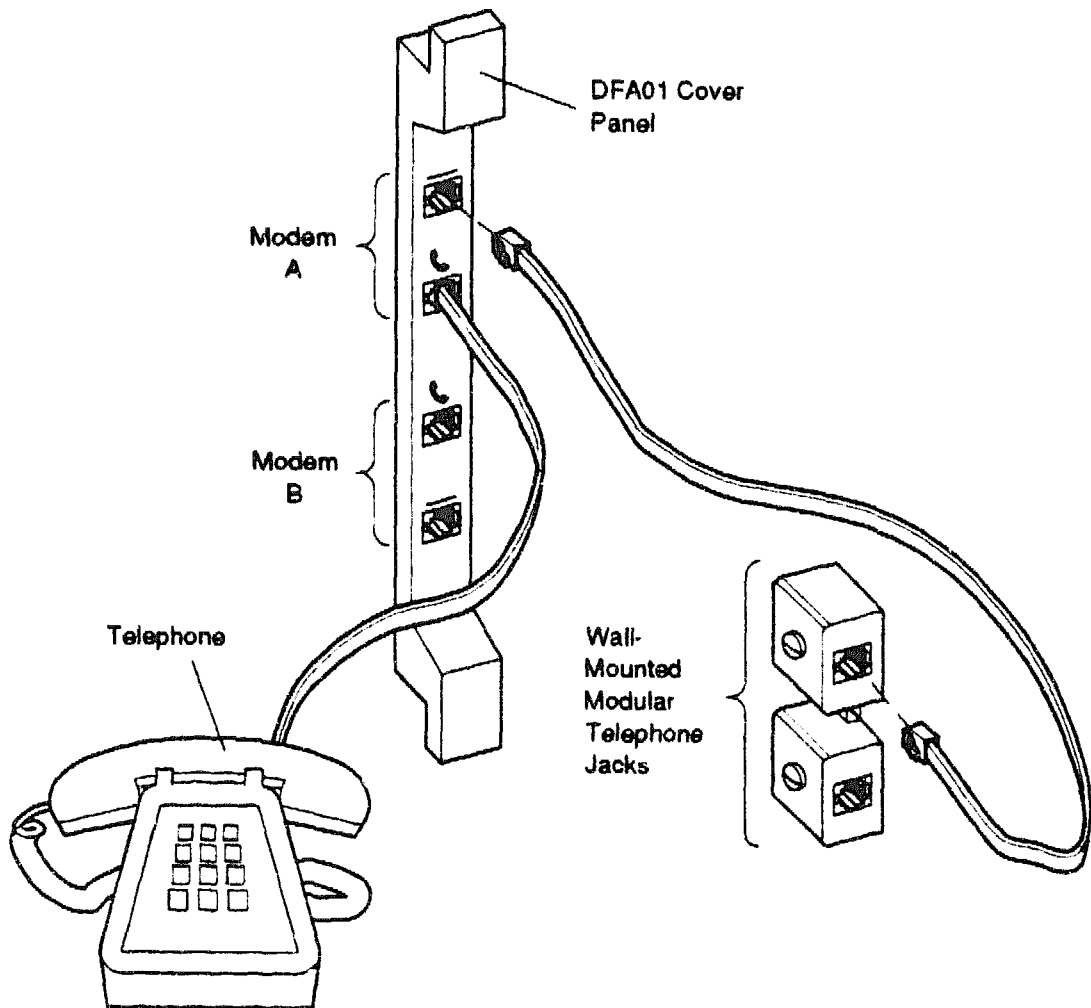
- a. Insert a second eight-wire telephone line into the bottom jack on the module cover, marked with a line icon. (Notice that the jack positions are reversed for modem B.)
- b. Insert the other end of the cord into a wall-mounted modular telephone jack.

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

4. If you require voice communication with a modem, you can install it in one of two ways:

- The first way of installing voice communication is established for modems A and B in the preceding steps. The telephone is connected to the wall-mounted modular telephone jack, which is in turn connected to the module cover (see Figure 13).
- The second way of installing voice communication is by connecting the telephone to the module cover, which is in turn connected to the wall-mounted modular telephone jack as shown in Figure 14.

Figure 14: Connecting a Modem to a Wall-Mounted Jack (Data Jack Service) — Telephone to DFA01 Connection



MLO-000657

- a. Leave connected the eight-wire telephone cord that attaches the module cover to a wall-mounted modular telephone jack.
- b. Disconnect the telephone line from the wall-mounted modular telephone jack. Leave the telephone line connected to the telephone.

- c. Connect the telephone line from the telephone to the module cover.
 - To install voice communication on modem A, insert the telephone line into the second jack from the top of the module cover, marked with the telephone icon.
 - To install voice communication on modem B, insert the telephone line into the second jack from the bottom of the module cover, marked with the telephone icon.

6.5.4 Setting Up Terminal Lines

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

Set up the operating system software to support the following four terminal lines for the 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 your operating system documentation to determine how to make permanent terminal line definitions, so that every time the system is turned on, the terminal lines are configured for proper operation.

You may need to define the following terminal line characteristics.

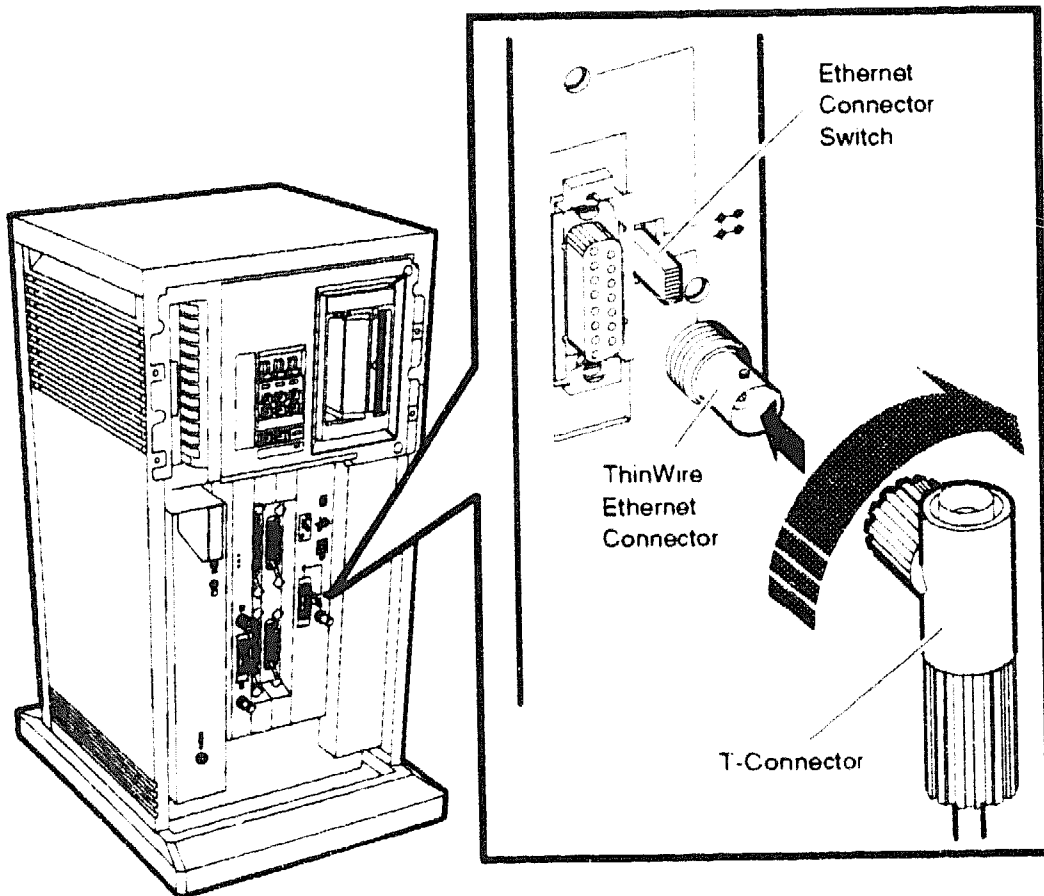
- Modem control — to support full EIA modem control.
- Speed, parity, and data bits — terminal lines should be set to 2400 baud, parity disabled, and 8 data bits to coincide with the modem power-up defaults.
- Dial up — to support dial-up operation.
- Hang up — to disable automatic hang up of the lines when logging out or when completing a dialog with the modem using terminal emulation software.

With automatic hang up disabled, you can modify the modem operating parameters (from application software or when using a terminal emulator). You can then exit the program without the modem resetting those parameters to power-up default values.

6.6 Connecting to an Ethernet Network at the CPU Cover Panel

An Ethernet Connector switch on the CPU cover panel (Figure 15) selects a standard or ThinWire connector. You must select one or the other.

Figure 15: Ethernet Connector Switch on the CPU Cover Panel



MLC-005698

- To select the ThinWire connector, slide the switch down. Then go to Section 6.6.1.
- To select the standard connector, slide the switch up. Then go to Section 6.6.2.

An indicator next to the selected connector lights when your system is turned on, indicating an active connection.

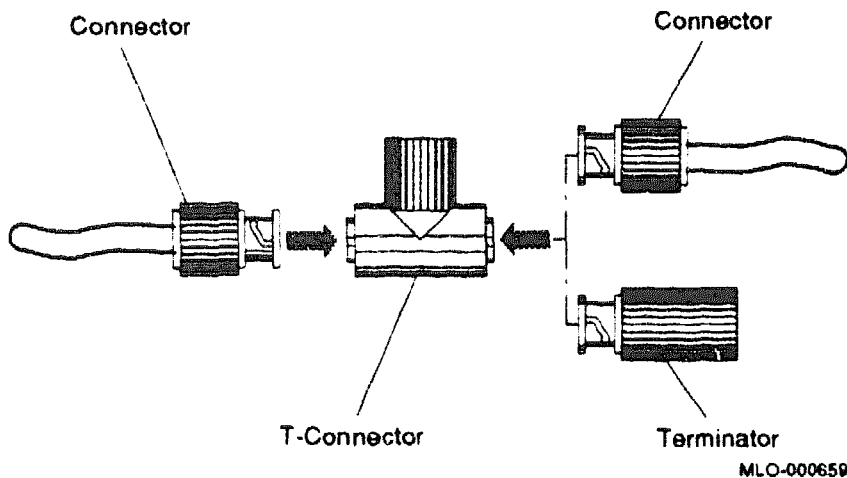
6.6.1 Making a ThinWire Network Connection at the CPU Cover Panel

To make a ThinWire network connection at the CPU cover panel:

1. Find the T-connector and two terminators. They are on the ThinWire connector, below the Ethernet Connector switch.

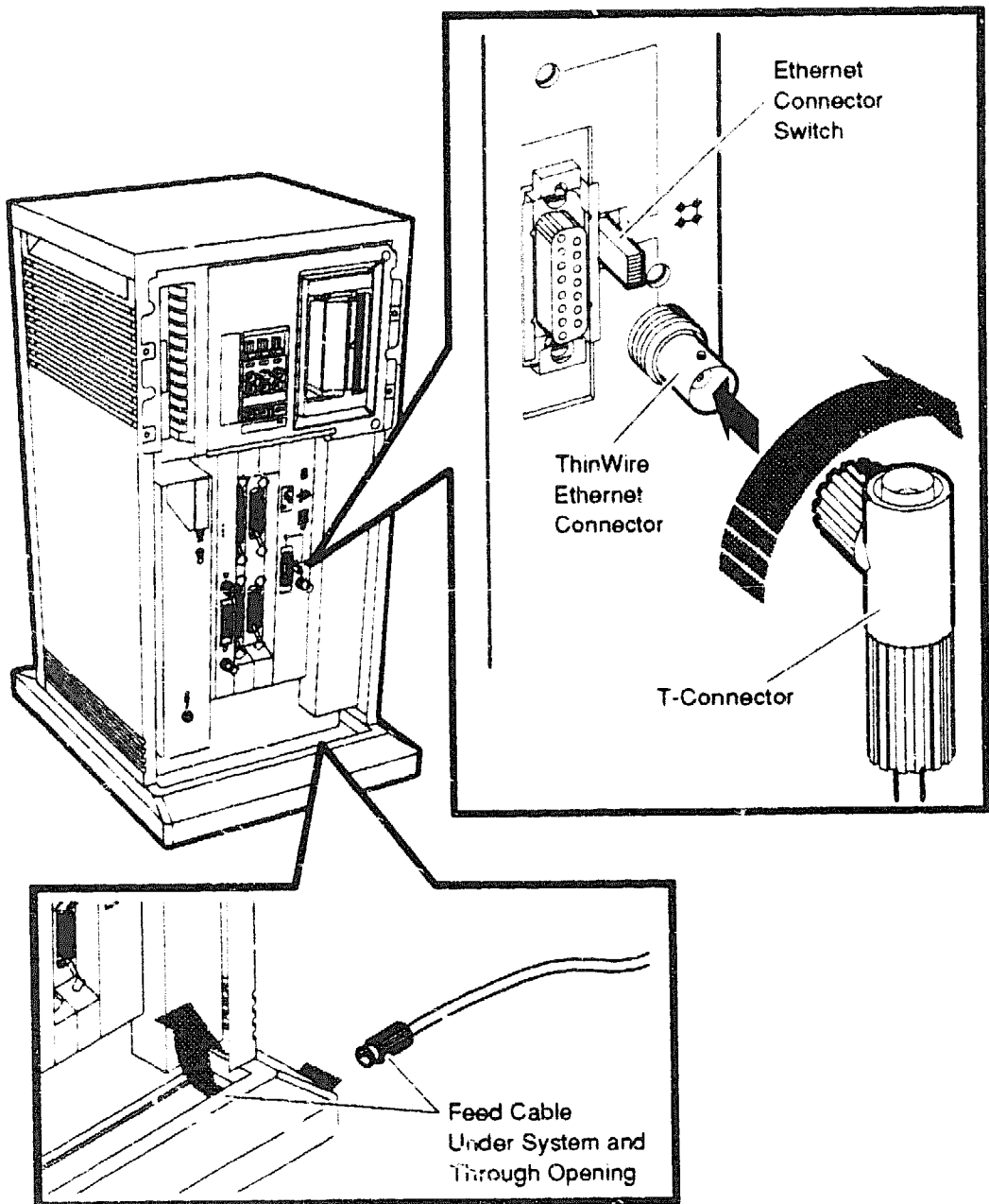
Figure 16 shows how the T-connector, terminators, and ThinWire cable connectors fit together.

Figure 16: ThinWire Cable, T-Connector, and Terminator



2. Remove the terminator from the bottom of the T-connector shown in Figure 17. Push in and turn it counterclockwise until it unlocks.

Figure 17: Making a ThinWire Ethernet Connection at the CPU Cover Panel



MLO-000660

3. Plug the T-connector into the ThinWire connector. Turn the T-connector clockwise until it locks in place.

4. Connect the ThinWire cable to the T-connector as shown in Figure 17.
 - If your system requires one connection to the network:
 - a. Connect the ThinWire cable to the lower end of the T-connector.
 - b. Connect a terminator to the other end of the T-connector.Push in and turn the connector or terminator clockwise until it locks in place.
 - If your system is a link in a network and connects to two additional components:
 - a. Connect a ThinWire cable to one end of the T-connector.
 - b. Remove the terminator from the other end and connect a second ThinWire cable to it.Push in and turn the connectors clockwise until they lock in place.
5. Connect the ThinWire cable to one of the following devices.
 - A ThinWire Ethernet Multiport Repeater (DEMPR), which can be connected to a baseband Ethernet cable and which connects up to eight ThinWire segments in a local area network
 - A ThinWire Ethernet Singleport Repeater (DESPR), which can be connected to a baseband Ethernet cable and which connects one ThinWire segment
 - A ThinWire Ethernet adapter in another system or workstation

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

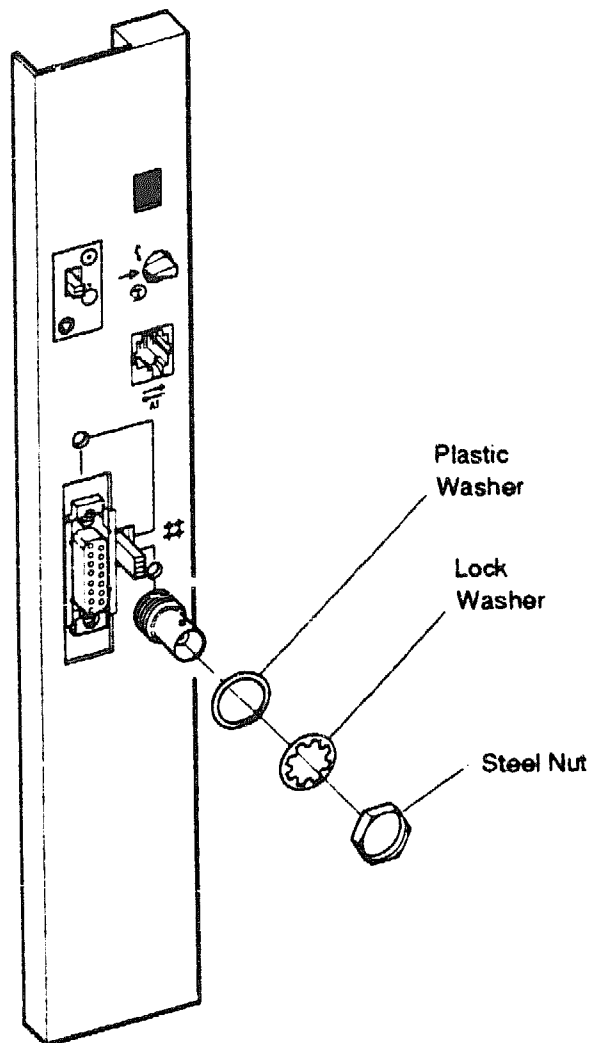
When the ThinWire cable is connected to a DEMPR or DESPR, the ground is provided by the DEMPR or DESPR chassis. If you are using a single-segment ThinWire Ethernet local area network (LAN) with no DEMPR or DESPR, you may need to ground the ThinWire connector on the CPU cover panel.

CAUTION: *Each ThinWire Ethernet segment must have only one grounding point.*

To ground a single-segment ThinWire network at the CPU cover panel:

1. Remove the steel nut, lock washer, and plastic washer from the ThinWire Ethernet connector on the CPU cover panel as shown in Figure 18.

Figure 18: Grounding the ThinWire Ethernet at the CPU Cover Panel



MLQ-000706

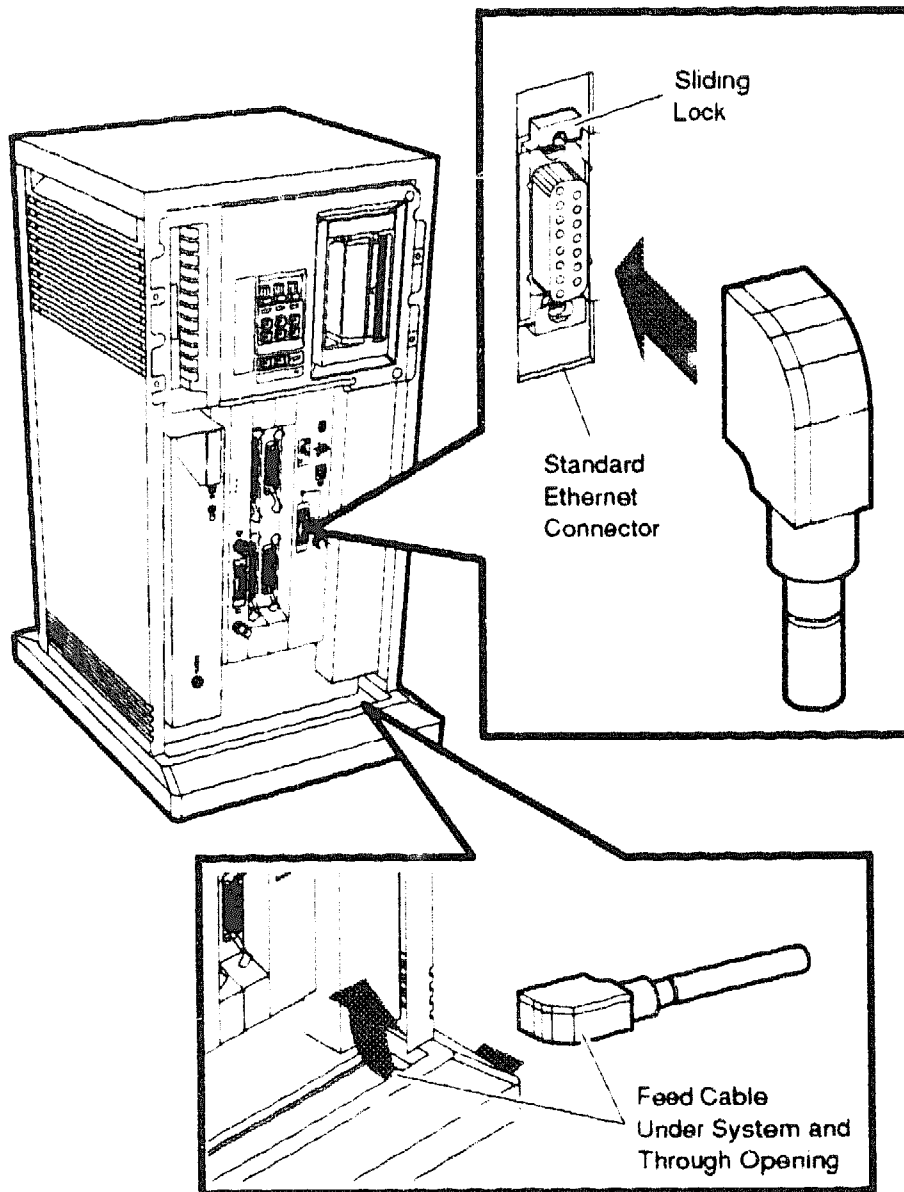
2. Discard the plastic washer.
3. Replace and tighten the lock washer and the steel nut.

6.6.2 Making a Standard Network Connection at the CPU Cover Panel

To make a standard network connection at the CPU cover panel:

1. Find the Ethernet transceiver cable. It has a plug at one end and a socket at the other end.
2. Make sure the sliding lock on the standard Ethernet connector on the CPU cover panel (Figure 19) is in the up position. Then feed the plug end of the cable under the system from the back or side and insert it into the connector. Slide the lock down to secure the connection.

Figure 19: Making a Standard Ethernet Connection at the CPU Cover Panel



MLO-003658

3. Connect the other end of the cable to one of the following devices.

- An H4000 or H4005 transceiver on a traditional baseband Ethernet cable
- A DELNI interconnect, which can be connected to a baseband Ethernet cable and which connects up to eight systems in a local area network
- A DESTA adapter, which can connect the Ethernet transceiver cable to ThinWire Ethernet cabling
- A standard adapter in another system or workstation

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

6.7 Connecting to an Ethernet Network at the DESQA Module

If your DESQA module does not have an Ethernet Connector switch (Figure 20):

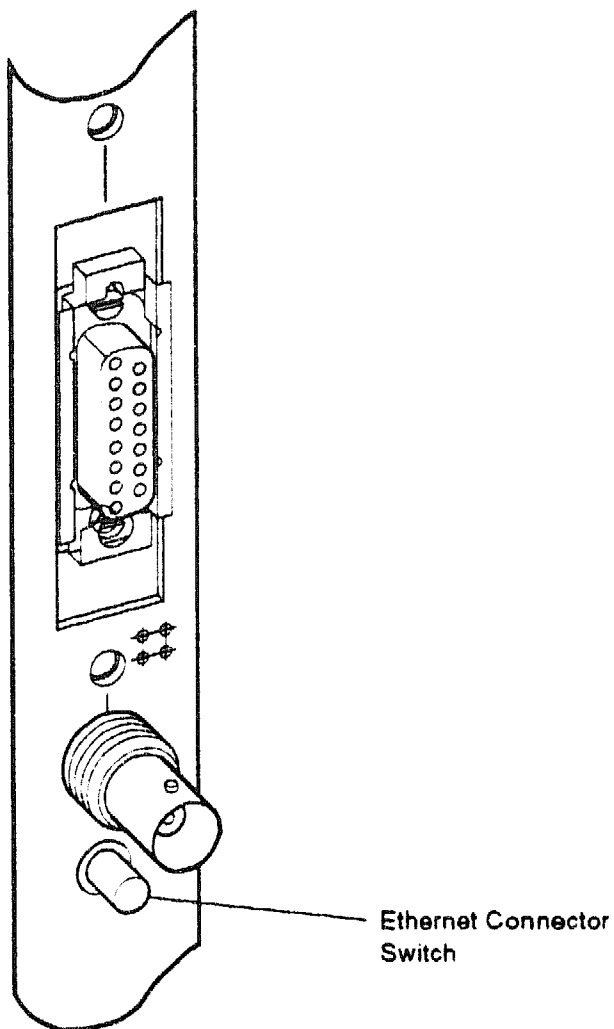
- If you want to connect to ThinWire Ethernet, go to Section 6.7.1.
- If you want to connect to standard Ethernet, call your Digital service representative.

If your DESQA module has an Ethernet Connector switch, you must select a ThinWire or a standard connector:

- To select the ThinWire connector, set that switch to the out position. Then go to Section 6.7.1.
- To select the standard connector, set that switch to the in position. Then go to Section 6.7.2.

An indicator next to the selected connector lights when your system is turned on, indicating an active connection.

Figure 20: DESQA ThinWire/Standard Ethernet Connector Switch



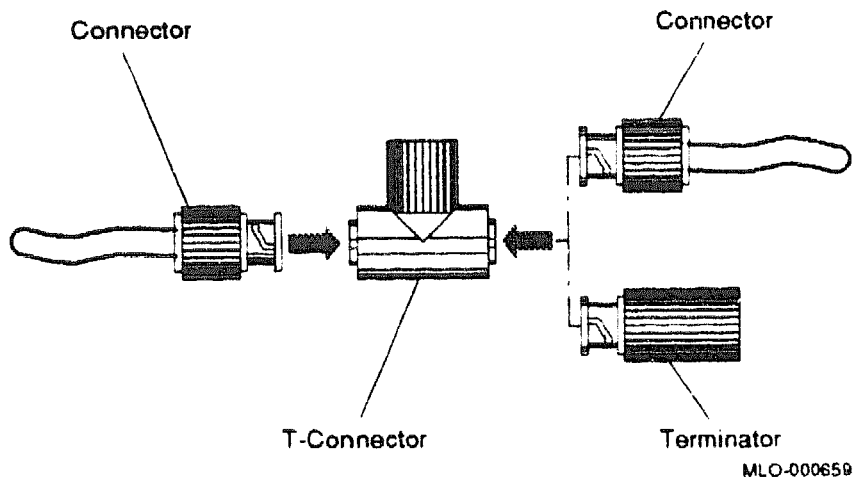
MLO-004023

6.7.1 Making a ThinWire Network Connection at the DESQA Module

If your DESQA module has an Ethernet Connector switch, make sure that switch is set to the out position.

A T-connector and two terminators are on the DESQA module. Figure 21 shows how the T-connector, terminators, and ThinWire cable connectors fit together.

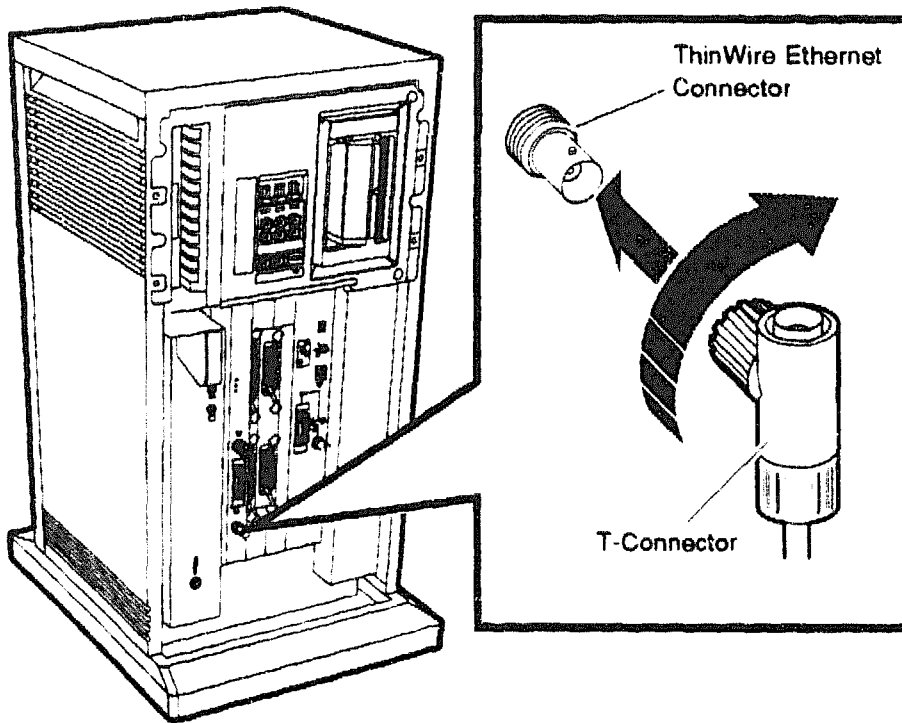
Figure 21: ThinWire Cable, T-Connector, and Terminator



To make a ThinWire network connection at the DESQA module:

1. Remove the T-connector from the module. Push in and turn it counterclockwise until it unlocks.
2. Remove the terminators from the T-connector. Push in and turn them counterclockwise until they unlock.
3. Connect the ThinWire cable to the T-connector as shown in Figure 22.

Figure 22: Making a ThinWire Ethernet Connection at the DESQA Module



MLO-005581

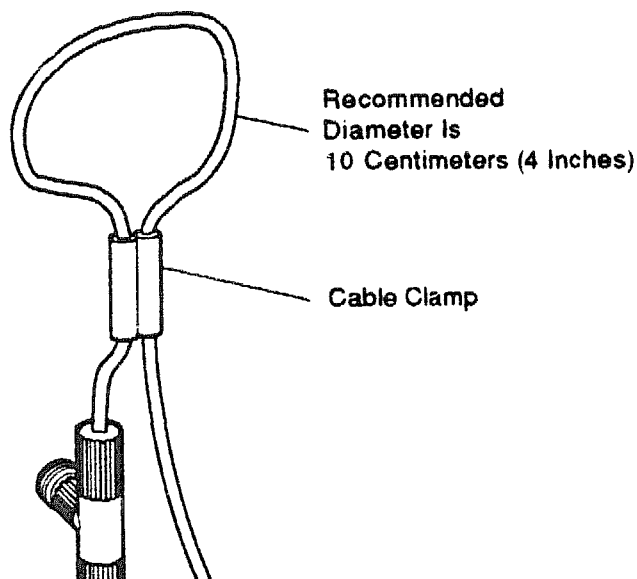
- If your system requires one connection to the network:
 - a. Connect the ThinWire cable to the upper end of the T-connector.
 - b. Connect a terminator to the other end of the T-connector.

Push in and turn the connector or terminator clockwise until it locks in place.
 - If your system is a link in a network and connects to two additional components:
 - a. Connect a ThinWire cable to one end of the T-connector.
 - b. Connect a second ThinWire cable to the other end of the T-connector.

Push in and turn the connectors clockwise until they lock in place.
4. Insert the T-connector into the ThinWire connector on the module as shown in Figure 22. Push in and turn the T-connector clockwise until it locks in place.

5. Use the cable clamp shipped with the module to form the upper cable in a loop approximately 10 centimeters (4 inches) in diameter as shown in Figure 23.

Figure 23: Forming the Upper Cable In a Loop at the DESQA Module



MLC-004020

6. Connect the ThinWire cable to one of the following devices.
 - A ThinWire Ethernet Multiport Repeater (DEMPR), which can be connected to a baseband Ethernet cable and which connects up to eight ThinWire segments in a local area network
 - A ThinWire Ethernet Singleport Repeater (DESPR), which can be connected to a baseband Ethernet cable and which connects one ThinWire segment
 - A ThinWire Ethernet adapter in another system or workstation

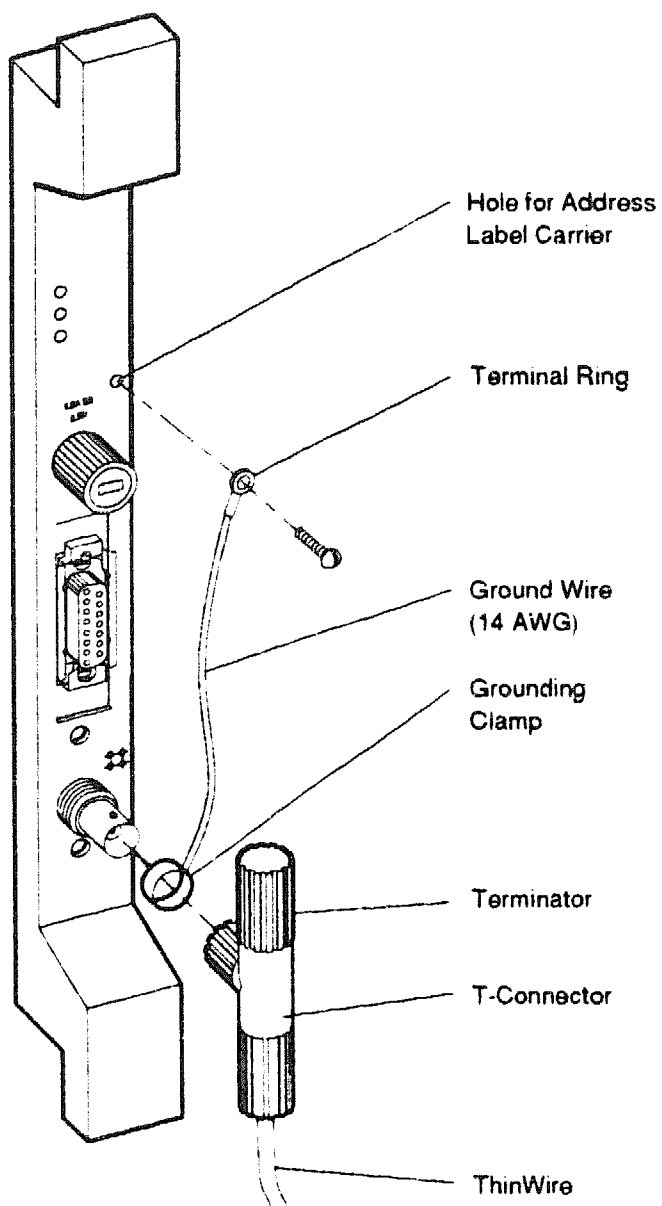
NOTE: *Contact your network manager or Digital service representative if you have questions about network configurations.*

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 local area network with no DEMPR or DESPR, you may need to ground the ThinWire connector on the DESQA module.

CAUTION: *Each ThinWire Ethernet segment must have only one grounding point.*

To ground a single-segment ThinWire network on the DESQA module, connect a grounding clamp (90-08927-00) and an unshrouded T-connector (12-25534-01) as shown in Figure 24, next page. Contact your Digital sales representative concerning those parts.

Figure 24: Grounding the ThinWire Ethernet at the DESQA Module



MLO-000664

6.7.2 Making a Standard Network Connection at the DESQA Module

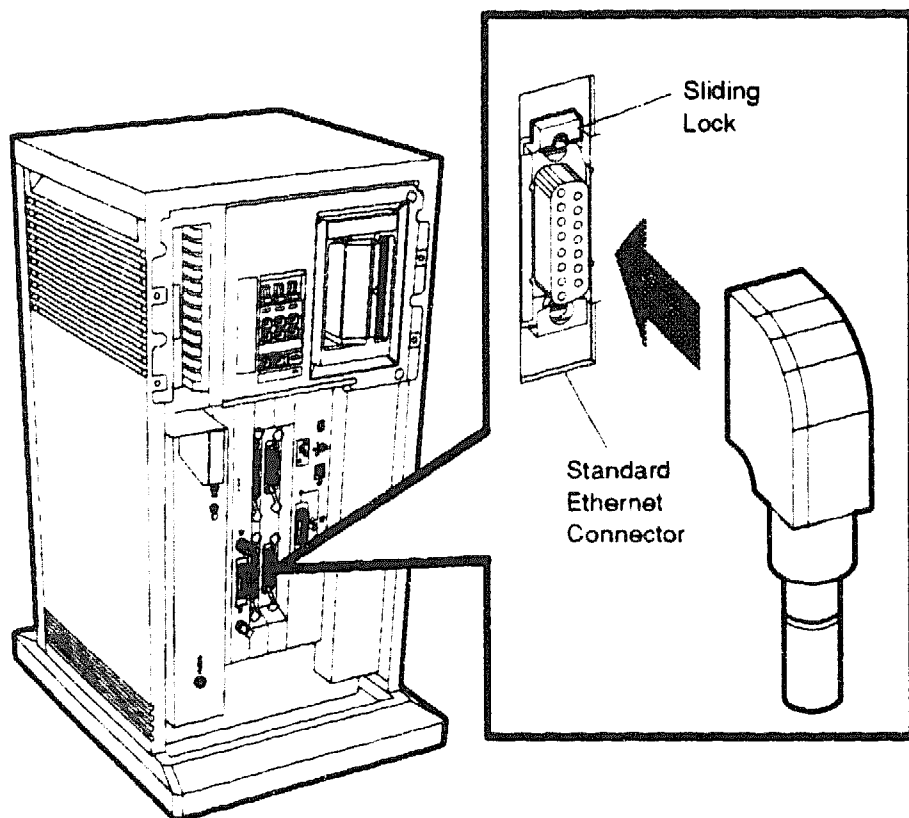
If your DESQA module does not have an Ethernet Connector switch, call your Digital service representative.

If your DESQA module has an Ethernet Connector switch and you set it to the in (standard) position:

1. Find the Ethernet transceiver cable. It has a plug at one end and a socket at the other end.
2. Make sure the sliding lock on the standard Ethernet connector on the module is in the up position.

3. Feed the plug end of the cable under the system from the back or side and insert it into the connector as shown in Figure 25. Slide down the lock to secure the connection.

Figure 25: Making a Standard Ethernet Connection at the DESQA Module



MLO-005582

4. Connect the other end of the cable to one of the following devices.
 - An H4000 transceiver on a traditional baseband Ethernet cable
 - A DELNI interconnect, which can be connected to a baseband Ethernet cable and which connects up to eight systems in a local area network

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

7 Connect the DSSI Cable — Dual Host Only

If you are not installing a dual-host system, skip to step 8.

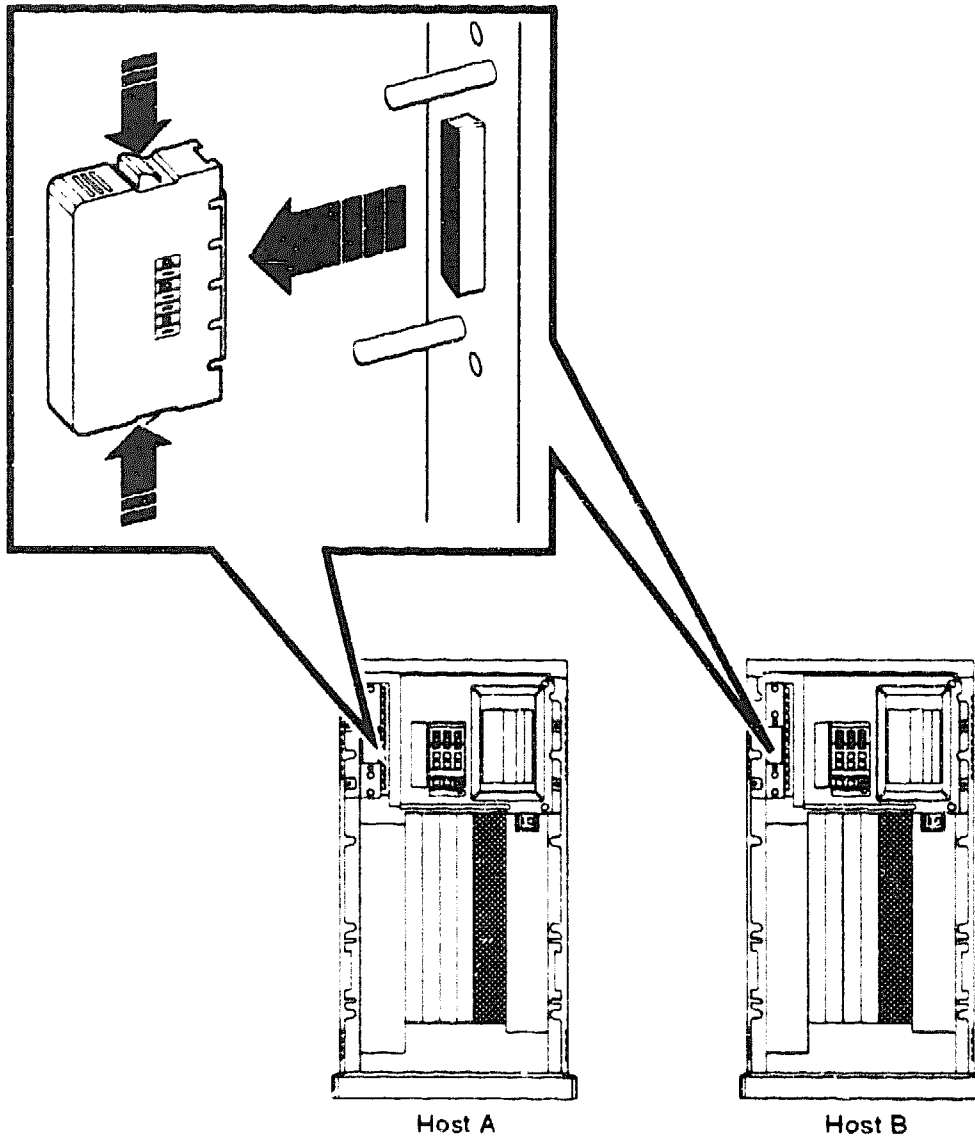
If you are installing a dual-host system:

NOTE: *If you want to renumber the system ISEs, refer to your Operation manual.*

1. For ease of discussion, call one of the systems host A, the other host B.

2. Remove the DSSI terminator from the host A DSSI In/Out connector shown in Figure 26. Squeeze the spring clips at the top and bottom of the terminator as you pull it straight out.

Figure 26: Removing the DSSI Terminators

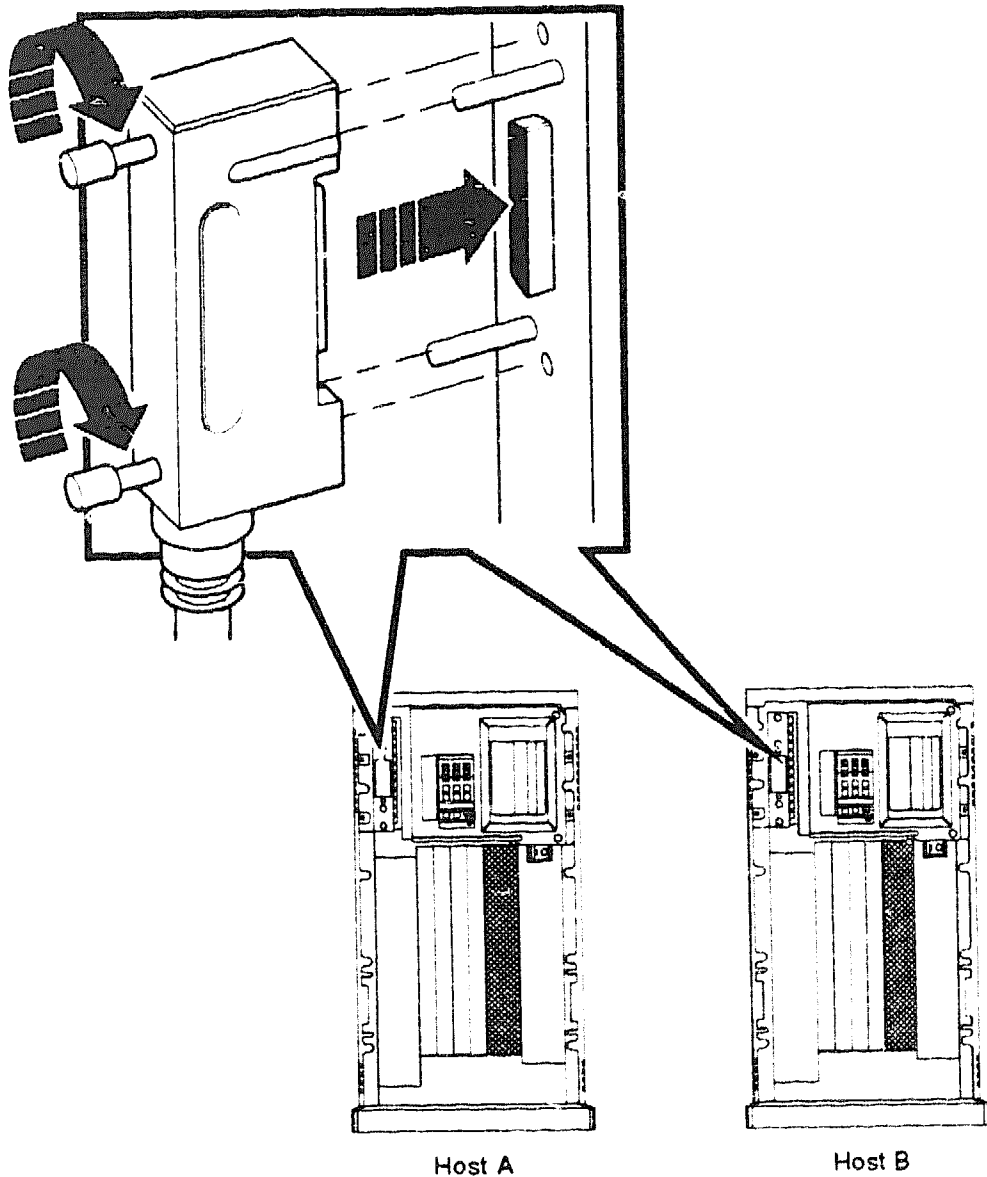


MLO-005583

3. Repeat the previous step for host B.
4. Find the 2.74-meter (9-foot) DSSI cable labeled BC21M-09, shipped with your system.

5. Feed either end of that cable under host A from the back or side. Then insert the cable connector into the DSSI In/Out connector by fitting the cable connector over the two guide pins shown in Figure 27.

Figure 27: Connecting the DSSI Cable



MLO-005584

Tighten the screws by hand, then use a screwdriver to secure the connection.

6. Repeat the previous step for host B using the opposite end of the DSSI cable.

8 Connect the System Power Cable

CAUTION: *Before continuing the installation, verify that your system power requirements match your power source. The correct voltage for the system is listed on the serial number label next to the power supply (see Figure 1).*

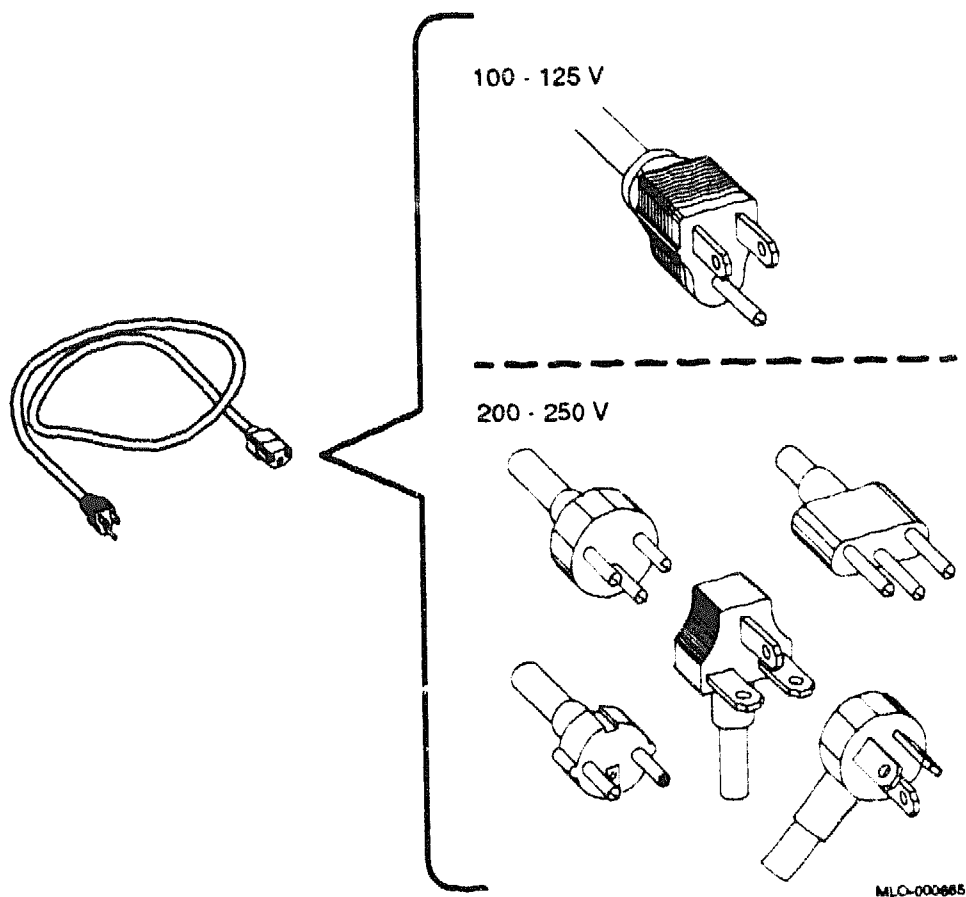
- *If the voltage matches your power source, continue the installation.*
- *If the voltage does not match your power source, do not continue the installation. Contact your Digital sales representative.*

Connect the power cable to your system as follows.

1. Make sure the Power switch is set to off (0).
2. Make sure all devices connected to your system are turned off.
3. Find the power cable shipped with your system.

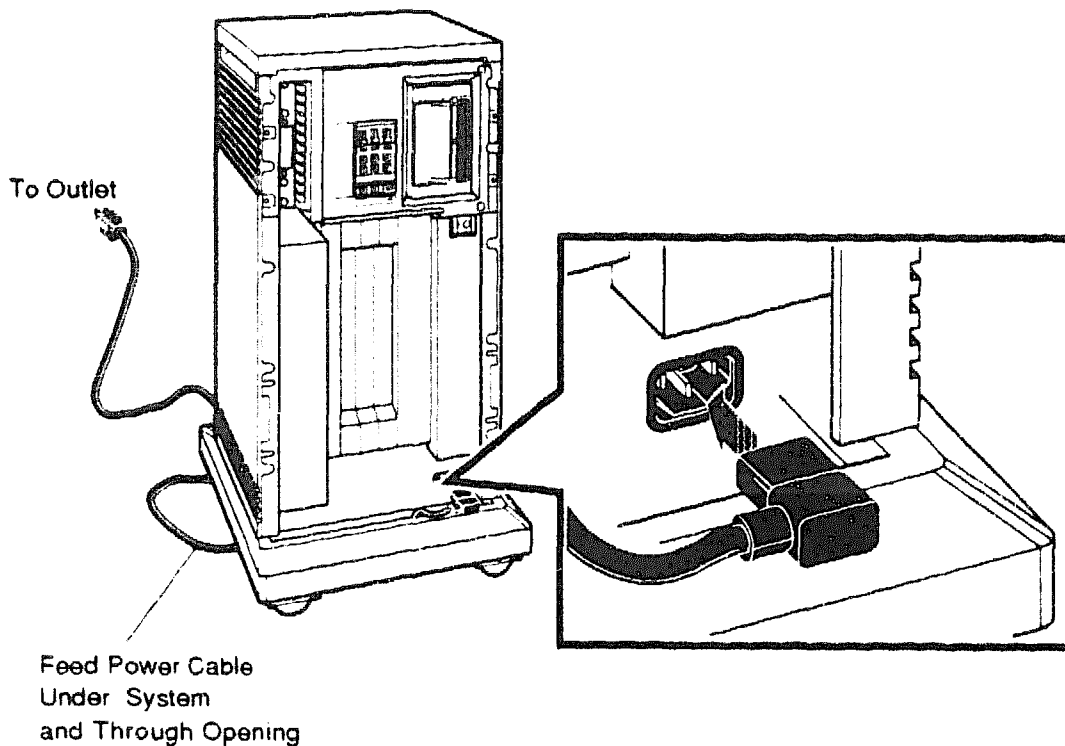
4. Make sure the plug end of that cable matches your wall outlet or other power source. Several types of plugs are shown in Figure 28.

Figure 28: Power Cables



5. Feed the socket end of the cable under the system from the back or side, and insert the cable into the power supply as shown in Figure 29.

Figure 29: Attaching the Power Cable to the System



MLC-000666

6. Insert the plug end of the cable into your wall outlet or other power source.

You are now ready to turn on your system and select a language.

9 Turn On the System and Select a Language

The language you select controls only the language of the console program which is part of the firmware in the CPU. That firmware lets you give commands to the system and also generates error messages.

NOTE: *For a dual-host system: You must turn on each host separately. If you want a language other than English (United States/Canada), you must select a language for each host.*

Turn on your system(s) and select a language for each as follows.

1. Turn on your console terminal and wait until it performs its self-tests successfully.
2. Turn on your system by setting the Power switch to on (1).

The switch should glow orange.

Within a few moments a language selection menu should appear on your console terminal as shown in Figure 30.

NOTE: *If you are using an older terminal that does not support multiple languages, the language selection menu does not appear and the system defaults to English (United States/Canada).*

Figure 30: Language Selection Menu

KA660-A Vn.n VMB n.n

- 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):

3. Select a language by typing its number and Return.

NOTE: *If you do not select a language within 30 seconds, the system defaults to English (United States/Canada).*

Within a few moments the console terminal should display a series of numbers as the system tests itself. The example in Figure 31 shows that display after successful testing.

Figure 31: Successful Self-Tests

KA660-A Vn.n, VMB n.n

Performing normal system tests.

95..94..93..92..91..90..89..88..87..86..85..84..83..82..81..80..
79..78..77..76..75..74..73..72..71..70..69..68..67..66..65..64..
63..62..61..60..59..58..57..56..55..54..53..52..51..50..49..48..
47..46..45..44..43..42..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..

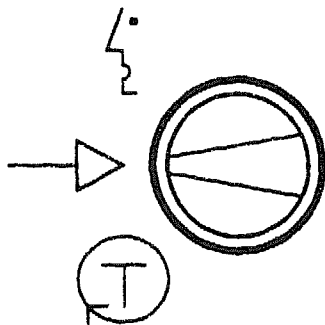
Tests completed.

>>>

If the self-tests do not start or do not complete successfully, as shown in Figure 31, your system may have a problem. For instructions on finding the source of the problem, refer to your system *Troubleshooting and Diagnostics* manual which is included in the Customer Hardware Information Kit.

4. If the self-tests complete successfully and you want to save the language you selected (so you need not select it each time you turn on the system), turn the Power-Up Mode switch to Run mode, which is indicated by an arrow on the CPU cover panel as shown in Figure 32.

Figure 32: Saving the Language



MLO-004255

Now you are ready to attach the front panel.

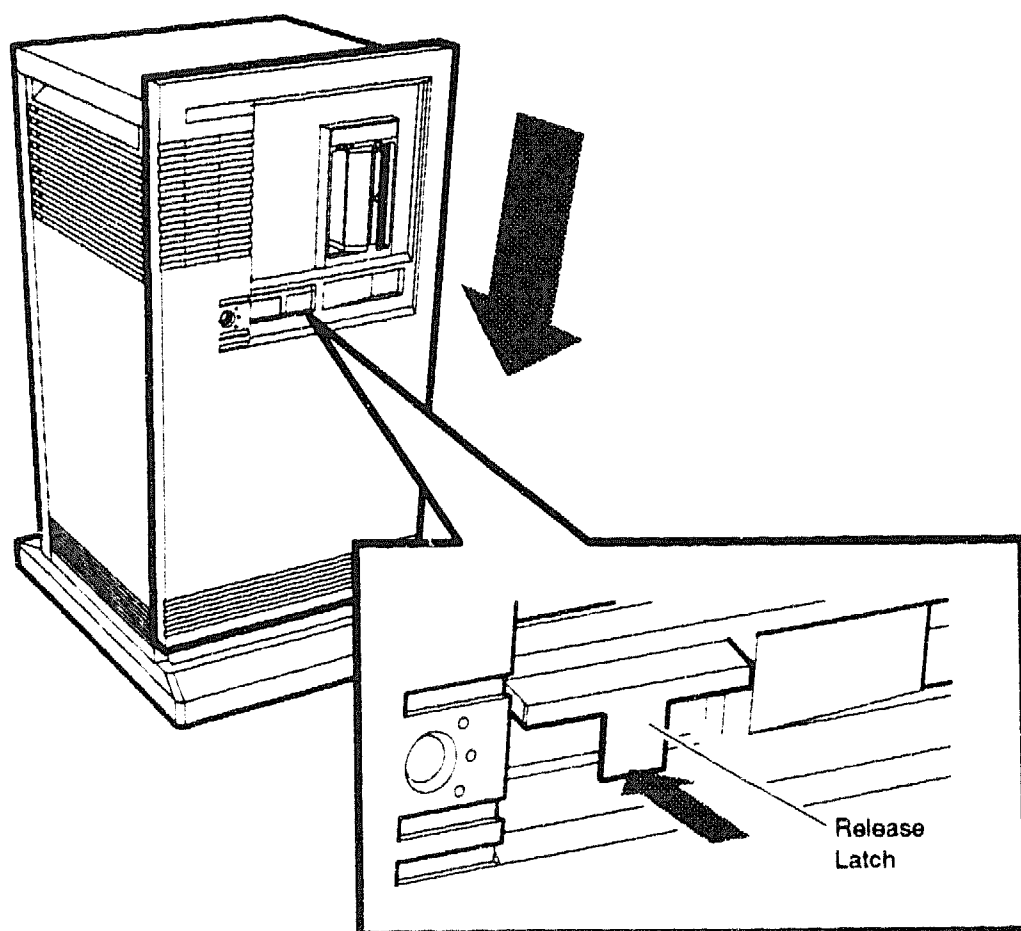
10 Attach the Front Panel to the System

If you plan to start up factory-installed software immediately following the installation, do not attach the front panel at this time.

Attach the front panel as shown in Figure 33.

NOTE: *The window on the front panel must be open. Instructions for operating the window controls are provided in your system Operation manual.*

Figure 33: Attaching the Front Panel



MLO-000669

1. Pull out the release latch on the front panel.

2. Holding the panel with both hands, place it flush against the front of the system, about an inch above the bottom.
3. Insert the hooks on the rear of the panel into the slots on the system. Then slide the panel down until it locks in place.
4. Secure the panel by pushing in the release latch.

11 After Installation

Digital strongly recommends that you run the diagnostic software for your system before you install system software or start factory-installed software the first time. The diagnostics:

- Verify the system configuration.
- Check to see if each device is working properly.

The diagnostic software is on a tape cartridge labeled MV DIAG CUST TK50. Your system *Troubleshooting and Diagnostics* manual tells you how to run the diagnostic software.

You should now read your system *Operation* manual to learn how to use the system. You must know how to operate the system controls and the disk or tape drive before you install system software or run diagnostic software.

If you have factory-installed software on your system, see Appendix A for the startup procedure. Otherwise, install the software that you ordered with your system.

NOTE: *A system with VMS factory-installed software has a yellow sticker on the front of the system.*

Appendix A

Starting and Modifying VMS Factory-Installed Software

This appendix tells you how to start and modify VMS factory-installed software (FIS), which is on your system disk if you ordered one or more ISEs.

FIS must be modified to accommodate customized passwords and system environment particulars. You make the modifications during a startup procedure that is executed when you start FIS the first time.

The requirements for modifying FIS depend on how your system will be used. For example, your system can be configured as a:

- Standalone system
- Dual-host system
- Simple VAXcluster network
- System in a more complex VAXcluster network with distributed resource sharing and sophisticated disk management

CAUTION: *If you want to modify FIS to obtain a dual-host or VAXcluster system, you should have a good understanding of DSSI architecture and VAXcluster software operation. If you do not have that understanding, you should read the manuals listed in Section A.1 or call your Digital service representative.*

A.1 Pre-Startup Requirements

Before you begin the startup procedure, you should:

1. Determine how your system will be configured.
2. Read through the startup procedure to make sure you have the correct information to enter for your configuration.

3. If your system will be part of a cluster or network, ask your network coordinator or system administrator for your system:

DECnet node name

DECnet node address

Cluster group number

Cluster password

4. If you are not familiar with networking and clustering, examine the following manuals.

VMS VAXcluster Manual

Guide to DECnet-VAX Networking

VMS Networking Manual

A.2 Startup Procedure

If you have a dual-host system, you can start with either host.

1. Enter the console mode.
 - a. Set the Power switch to off (0).
 - b. Set the Break Enable/Disable switch to enable (up, dot inside circle).
 - c. Set the Power switch to on (1).

Wait for your system to complete its self-tests and display the console prompt (>>>).

2. Make sure the system disk is on line and is not write-protected.
 - The Run/Ready button should be in (lit).
 - The Write-Protect button should be out (not lit).
3. If your system will be configured as a cluster with a nonzero allocation class, see your system *Operation* manual for information on how to program parameters for ISEs.

4. Define the system disk as the default boot device.

```
>>> SET BOOT DIA0 Return
```

5. Boot the FIS.

```
>>> BOOT Return
```

6. Set the Break Enable/Disable switch to disable (down, dot outside circle).

The system displays a banner and then prompts you for the date and time.

```
VAX/VMS Version Vn.n   Major version id = 1 Minor version id = 0
```

```
Please enter date and time (DD-MMM-YYYY HH:MM):
```

7. Enter the date and time in the format shown. For example:

```
Please enter date and time (DD-MMM-YYYY HH:MM): 03-JUL-1991 12:00 Return
```

Some messages are displayed, followed by a prompt:

```
-----
Modifying Factory Installed Software for Customer Use

%SET-I-NEWAUDSRV, identification of new audit server.....
%LICENSE-F-EMTLDB, license database contains no license records
.
.
.
Do you want to enter Customer's cluster and password information(Y/N)?
```

8. Refer to the appropriate section to complete the startup procedure for a:
 - Standalone system, Section A.2.1
 - Simple VAXcluster network, Section A.2.2
 - Dual-host system or complex VAXcluster network, Section A.2.3

A.2.1 Modifying FIS for a Standalone System

The following procedure modifies FIS for a standalone system.

```
Do you want to enter Customer's cluster and password information(Y/N)?
```

1. Enter Y (type Y and Return).

The system asks you to confirm the date and time.

```
The system time is dd-mmm-yyyy   hh:mm:ss:ss
```

```
Is this correct? (Y/N)
```

2. If the date and time are incorrect, enter N. With that answer, the system reprompts you to enter the correct date and time and then to review it.

If you enter Y, the system displays the following prompt.

```
Will this node be a cluster member (Y/N)?
```

3. Enter N.

If DECwindows is on the system disk, you will see the following prompt.

Do you want DECwindows as the default windowing system? (Y/N)

NOTE: *It is easy to set DECwindows as the default windowing system at a later stage. To do that, you must modify the VMS system generation parameter, WINDOW_SYSTEM, generate a new set of bootstrap parameters, and boot the system again. See the VMS Installation and Operations Manual, the Guide to Setting Up a VMS System, or the VMS System Generation Utility Manual for more information.*

4. If you want DECwindows as the default windowing system, enter Y. Otherwise, enter N.

The system displays prompts asking for account passwords.

5. Enter them as shown below.

NOTE: *The passwords shown are samples. You should enter your own passwords. Remember to record them. If you forget a password, you cannot log in.*

Enter new password for account SYSTEM: **PANCAKES**

Re-enter the password for account SYSTEM: **PANCAKES**

*UAF-I-MDFYMSG, user record(s) updated

Enter new password for account SYSTEST: **BRATHWURST**

Re-enter the password for account SYSTEST: **BRATHWURST**

*UAF-I-MDFYMSG, user record(s) updated

Enter new password for account FIELD: **ZIRHUMBA**

Re-enter the password for account FIELD: **ZIRHUMBA**

*UAF-I-MDFYMSG, user record(s) updated

The system verifies the passwords and rejects any that can be easily guessed. The following status messages are displayed if the passwords are acceptable.

*VMS-I-PWD_OKAY, account password for SYSTEM verified

*VMS-I-PWD_OKAY, account password for SYSTEST verified

*VMS-I-PWD_OKAY, account password for FIELD verified

Then the following status message is displayed.

Creating RIGHTS database file, SYSSYSTEM:RIGHTSLIST.DAT

Ignore any messages of this type.

*SYSTEM-F-DUPIDENT, duplicate identifier

The following status message is displayed when the FIS setup procedure completes.

```
%UAF-I-RDBDONEMSG, rights database modified
```

The system then displays messages that remind you to perform certain tasks after the software is installed:

- Register any Product Authorization Keys (PAKs).
- Back up the system disk.
- Tailor the system disk.

Finally, the system displays the following message, followed by other status messages.

```
Running AUTOGEN -- Please wait
```

At this point the system shuts itself down and then reboots from the default boot device. The process takes several minutes, and the system displays a series of information messages:

```
SHUTDOWN -- Perform an Orderly System Shutdown
```

```
VAX/VMS Version Vn.n   Major version id = 1 Minor version id = 0
```

```
SYSTEM                job terminated at 24-JUL-1991 14:47:28.34
```

```
Accounting information:
```

Buffered I/O count:	133	Peak working set size:	401
Direct I/O count:	12	Peak virtual size:	2379
Page faults:	325	Mounted volumes:	0
Charged CPU time:	0 00:00:55.23	Elapsed time:	0 00:01:31.24

6. Press **Return**.

The system prompts you for a username and password.

7. Log in to the SYSTEM account as shown below.

```
Welcome to VAX/VMS
```

```
USERNAME: SYSTEM Return
```

```
PASSWORD: PANCAKES Return
```

```
%LICENSE-I-NOLICENSE, no license is active for this software product  
%LOGIN-LOGOPRCON, login allowed from OPA0:
```

```
Welcome to VAX/VMS
```

```
$
```

The system prompt (\$) indicates the completion of the startup procedure.

If you do not enter the correct password, the system displays the following message.

User authorization failure

If you forget your password, follow the instructions for breaking into the system given in *Guide to Setting Up a VMS System*.

8. You should now perform the following operations.
 - Register any PAKs you received with your system.
 - Back up the system disk.
 - Delete unwanted files.

To register PAKs:

```
$ @SYSSUPDATE:VMSLICENSE 
```

If you make a mistake while entering a PAK:

1. Continue the data entry sequence.
2. Reject the data at the end of the sequence when your system asks you to confirm the data.

Your system then gives you an opportunity to reenter the data correctly. See the *VMS License Management Utility Manual* for any additional information you may need.

Your system *Operation* manual provides information on backing up the system disk and deleting unwanted files. Read carefully to determine the exact sequence of backup and tailoring functions needed, based on the amount of tailoring required and the backup resources available to you.

See the *VMS Installation and Operations Manual* for more information on entering PAKs, customizing and testing your system, startup and shutdown, and backup procedures.

Later you can use the NETCONFIG.COM and CLUSTER_CONFIG.COM command procedures to include your system in a network and cluster, provided you have the appropriate software licenses and PAKs. See the *VMS VAXcluster Manual*, the *Guide to DECnet-VAX Networking*, and the *VMS Networking Manual* for more information.

A.2.2 Modifying FIS for a Simple VAXcluster Network

If you want to use your system as part of a simple VAXcluster network, where disks are shared between different systems in the same network, you need a node name and node ID which you can obtain from your network coordinator.

The following procedure configures FIS for use as a server in a simple VAXcluster network. The configuration can be modified later, if required, using standard VMS procedures.

Do you want to enter Customer's cluster and password information (Y/N)?

1. Enter Y (type Y and).

The system asks you to confirm the date and time.

The system time is dd-mm-yyy hh:mm:ss

Is this correct? (Y/N)

2. If the date and time are incorrect, enter N. With that answer, the system reprompts you to enter the correct date and time and then to review it.

If you enter Y, the system displays the following prompt.

Will this node be a cluster member (Y/N)?

3. Enter Y.

A series of system prompts are displayed.

4. Respond to those prompts as listed below.

What is the node's DECnet node name?

Enter the DECnet node name (for example, JUPITR). It can be from one to six alphanumeric characters long and cannot include dollar signs or underlines.

What is the node's DECnet node address?

Enter the DECnet node address (for example, 2.2). You can obtain it from your network coordinator.

Will the Ethernet be used for cluster communications (Y/N)?

Enter Y. The Ethernet is required for cluster (SCS internode) communications in local area and mixed-interconnect configurations.

Enter this cluster's group number:

Enter a number in the range of 1 to 4095 or 61440 to 65535. You can obtain the number from your network coordinator.

Enter the cluster's password:

Enter the password. It can be from 1 to 31 alphanumeric characters long and can include dollar signs and underlines. You can obtain it from your network coordinator.

Re-enter the cluster's password for verification:

Reenter the password.

Will JUPITR be a disk server (Y/N)?

Enter Y. In local area and mixed-interconnect configurations, the system disk is served to the cluster. See the *VMS VAXcluster Manual* for information on served cluster disks.

Will JUPITR serve HSC disks (Y)?

Enter N.

Will JUPITR serve RFxx disks (Y)?

Enter Y.

Enter a value for JUPITR's ALLOCLASS parameter:

Enter 0 or the desired allocation class for your system.

Does this cluster contain a quorum disk (Y/N)?

Enter N.

If DECwindows is on the system disk, you will see the following prompt.

Do you want DECwindows as the default windowing system? (Y/N)

NOTE: *It is easy to set DECwindows as the default windowing system at a later stage. To do that, you must modify the VMS system generation parameter, WINDOW_SYSTEM, generate a new set of bootstrap parameters, and boot the system again. See the VMS Installation and Operations Manual, the Guide to Setting Up a VMS System, or the VMS System Generation Utility Manual for more information.*

5. If you want DECwindows as the default windowing system, enter Y. Otherwise, enter N.

The system displays prompts asking for account passwords.

6. Enter them as shown below.

NOTE: The passwords shown are samples. You should enter your own passwords. Remember to record them. If you forget a password, you cannot log in.

Enter new password for account SYSTEM: **PANCAKES**
Re-enter the password for account SYSTEM: **PANCAKES**
*UAF-I-MDFYMSG, user record(s) updated

Enter new password for account SYSTEST: **BRATHWURST**
Re-enter the password for account SYSTEST: **BRATHWURST**
*UAF-I-MDFYMSG, user record(s) updated

Enter new password for account FIELD: **ZIRHUMBA**
Re-enter the password for account FIELD: **ZIRHUMBA**
*UAF-I-MDFYMSG, user record(s) updated

Your system verifies the passwords and rejects any that can be easily guessed. The following status messages are displayed if the passwords are acceptable.

*VMS-I-PWD_OKAY, account password for SYSTEM verified
*VMS-I-PWD_OKAY, account password for SYSTEST verified
*VMS-I-PWD_OKAY, account password for FIELD verified

Then the following status message is displayed.

Creating RIGHTS database file, SYS\$SYSTEM:RIGHTSLIST.DAT

Ignore any messages of this type.

*SYSTEM-F-DUPIDENT, duplicate identifier

The following status message is displayed when the FIS setup procedure completes.

*UAF-I-RDBDONEMSG, rights database modified

Then the system displays messages that remind you to perform certain tasks after the software is installed.

- Register any Product Authorization Keys (PAKs).
- Back up the system disk.
- Tailor the system disk.

Finally, the system displays the following message, followed by other status messages.

Running AUTOGEN -- Please wait

At this point, the system shuts itself down and then reboots from the default boot device. The process takes several minutes, and the system displays a series of information messages.

SHUTDOWN -- Perform an Orderly System Shutdown

VAX/VMS Version Vn.n Major version id = 1 Minor version id = 0

SYSTEM job terminated at 24-JUL-1991 14:47:28.34

Accounting information:

Buffered I/O count:	133	Peak working set size:	401
Direct I/O count:	12	Peak virtual size:	2379
Page faults:	325	Mounted volumes:	0
Charged CPU time:	0 00:00:55.23	Elapsed time:	0 00:01:31.24

7. Press **Return**.

The system prompts you for a username and password.

8. Log in to the SYSTEM account as shown below.

Welcome to VAX/VMS

USERNAME: **SYSTEM** **Return**

PASSWORD: **PANCAKES** **Return**

%LICENSE-I-NOLICENSE, no license is active for this software product

%LOGIN-LOGOPRCON, login allowed from OPA0:

Welcome to VAX/VMS

\$

The system prompt (\$) indicates the completion of the startup procedure.

If you do not enter the correct password, the system displays the following message.

User authorization failure

If you forget your password, follow the instructions for breaking into the system given in *Guide to Setting Up a VMS System*.

9. You should now perform the following operations.

- Register any PAKs you received with your system.
- Back up the system disk.
- Delete unwanted files.

To register PAKs:

\$ **@SYS\$UPDATE:VMSLICENSE** **Return**

If you make a mistake while entering a PAK:

1. Continue the data entry sequence.
2. Reject the data at the end of the sequence when your system asks you to confirm the data.

Your system then gives you an opportunity to reenter the data correctly. See the *VMS License Management Utility Manual* for any additional information you may need.

Your system *Operation* manual provides information on backing up the system disk and deleting unwanted files. Read carefully to determine the exact sequence of backup and tailoring functions needed, based on the amount of tailoring required and the backup resources available to you.

See the *VMS Installation and Operations Manual* for more information on entering PAKs, customizing and testing your system, startup and shutdown, and backup procedures.

In a VAXcluster network, queues for printer and batch processing operations can be configured to work on other systems in the cluster. See your network coordinator for details of queues that are available in your network. If you are setting up a new network, see the *VMS VAXcluster Manual* for a discussion on setting up remote printer and batch processing queues.

You can use the NETCONFIG.COM command procedure to include your system in a network, provided you have the appropriate software licenses and PAKs. See the *VMS VAXcluster Manual*, the *Guide to DECnet-VAX Networking*, and the *VMS Networking Manual* for more information.

A.2.3 Modifying FIS for a Complex Network or Dual-Host System

In a complex network or dual-host system you may want to enter the disk allocation class and quorum disk information for the network. That information lets disks be shared on a selective basis between some systems on the network. Quorum disk information also allows more rigorous definition of cluster operations during the removal of systems from the network.

In addition, queues for printer and batch processing operations can be set up, allowing work to be executed on other systems in the network.

See the *VMS VAXcluster Manual*, the *Guide to DECnet-VAX Networking*, and the *VMS Networking Manual* for information on setting up systems as members of complex networks and setting up remote printer and batch processing queues.

A.2.3.1 Configuring for Dual-Host Systems

The *VMS Installation and Operations* manual tells you how to configure a dual-host system for cluster operation. You can set up the system for operation as a:

- Pair of boot servers for a new local area cluster to which you intend to add satellites
- Two-node cluster to which you do not intend to add satellites
- Pair of boot servers that you want to add to an existing cluster

NOTE: *You must assign the same allocation class to both systems and to the ISEs. The allocation class must be different from that of other systems and hierarchical storage controllers (HSCs) in a cluster. Refer to your system Operation manual for information on setting parameters for ISEs.*

The following software licenses are required to configure a dual-host system.

Host A	Host B
VMS	VMS
VAXcluster	VAXcluster
DECnet full-function	DECnet end-node

A.2.3.2 Checking Your Modification Work

You can use two commands to check your work after you modify FIS for a dual-host system.

- Use **SHOW DEVICE D** to list the ISEs. Make sure the number of ISEs listed matches the number in your dual-host system.

Too many ISEs indicates an incorrect allocation class setting for an ISE.

Too few ISEs indicates an incorrect unit number for an ISE.

- Use **SHOW DEVICE DI/FULL** to check that the alternate host name for your dual-host system is displayed.

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VAX 4000 Model 200 (BA215) Operation

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S1573

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Preface

This manual describes how to use VAX 4000 Model 200 (BA215) timesharing and VAXserver 4000 Model 200 (BA215) server systems. The hardware and software for each of these systems differ slightly, according to the function of the system. The VAX 4000 is a multiuser system that uses the VMS operating system. The VAXserver 4000 system is a single-user system that uses VMS or VAXELN operating systems. Both systems can function 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.
- Appendix A lists related documentation.
- Appendix B describes how to set and examine internal parameters for RF-series ISEs.
- Appendix C describes procedures for creating backup files.
- Appendix D describes how to use VMSTAILOR to remove unwanted VMS files from the system disk.
- The glossary explains key terms.

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

Conventions

The following conventions are used in this manual:

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 keyboard. Return indicates that you press the Return key on your terminal keyboard.
Ctrl/C	A symbol indicating that you hold down the Ctrl key while you press the C key.
BOLD	This bold type indicates user input. For example: >>> BOOT MUA0 This line shows that the user must enter BOOT MUA0 at the console prompt.
NOTE	Provides general information about the current topic.
CAUTION	Provides information to prevent damage to equipment or software.
WARNING	Provides information to prevent personal injury.

Chapter 1

System Overview

VAX 4000 Model 200 (BA215) systems house all components in a BA215 enclosure. This enclosure is a free-standing pedestal that houses the following:

- Card cage
- System controls
- Central processing unit (CPU) module
- Memory modules
- Communications controller modules
- Tape drive controller module
- CPU cover panel
- RF-series Integrated Storage Elements
- TK70 tape drive¹
- Power supply
- Fans

Up to two RF-series Integrated Storage Elements (ISEs) and one TK-series tape drive can be mounted inside the BA215 enclosure.

This chapter describes the VAX 4000 Model 200 (BA215) system components and their functions.

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

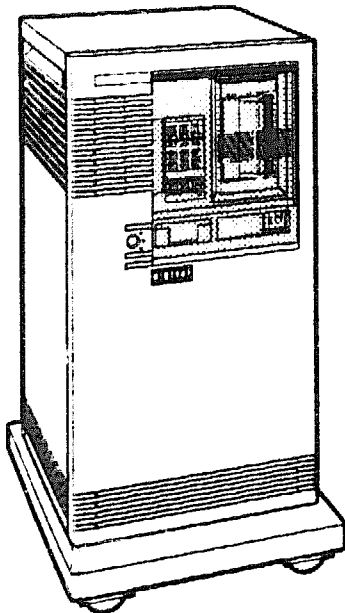
¹ Optionally, the system may be tapeless, or a TK50 tape drive may be configured into the system.

1.1 Front View and Physical Description

The system has a removable front panel that restricts access to some of the system controls.

Figure 1-1 shows the system with the front panel attached.

Figure 1-1: VAX 4000 Model 200 (BA215) System



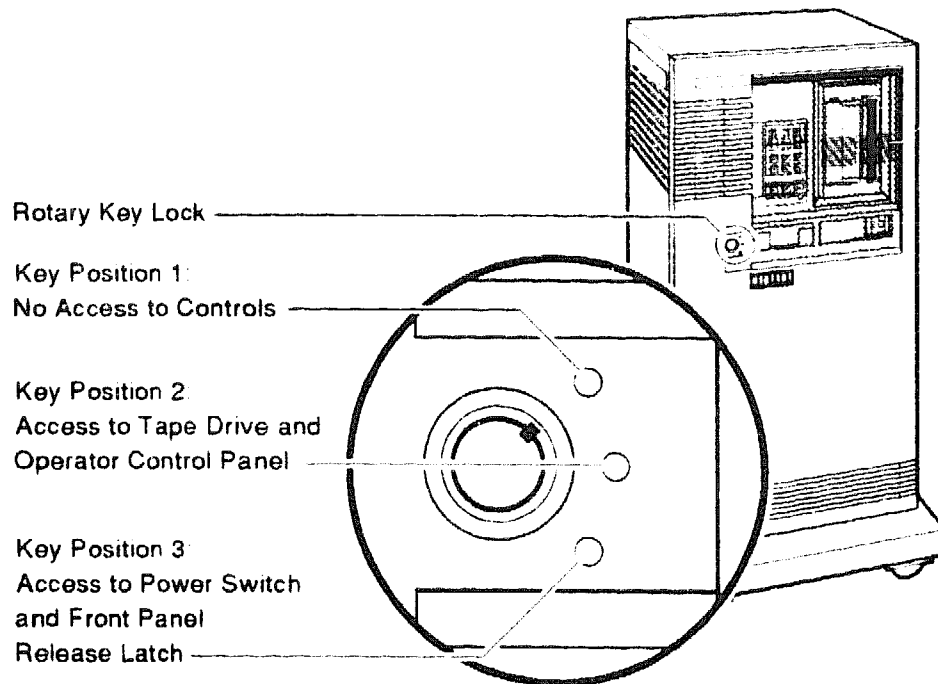
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The front panel has a sliding window controlled by a three-position rotary lock. You can lock the window in one of three positions: closed, partially open, and fully open. Each position limits access to certain system controls. When the window is locked in any of its three positions, you can still raise it to a higher position. However, you cannot lower it beyond the locked position without using the key.

To open the window, turn the key to position 2 or 3, then slide the window down. To close the window, slide the window up, then turn the key to lock the window in position.

Figure 1-2 shows the three key positions and the controls accessible in each position.

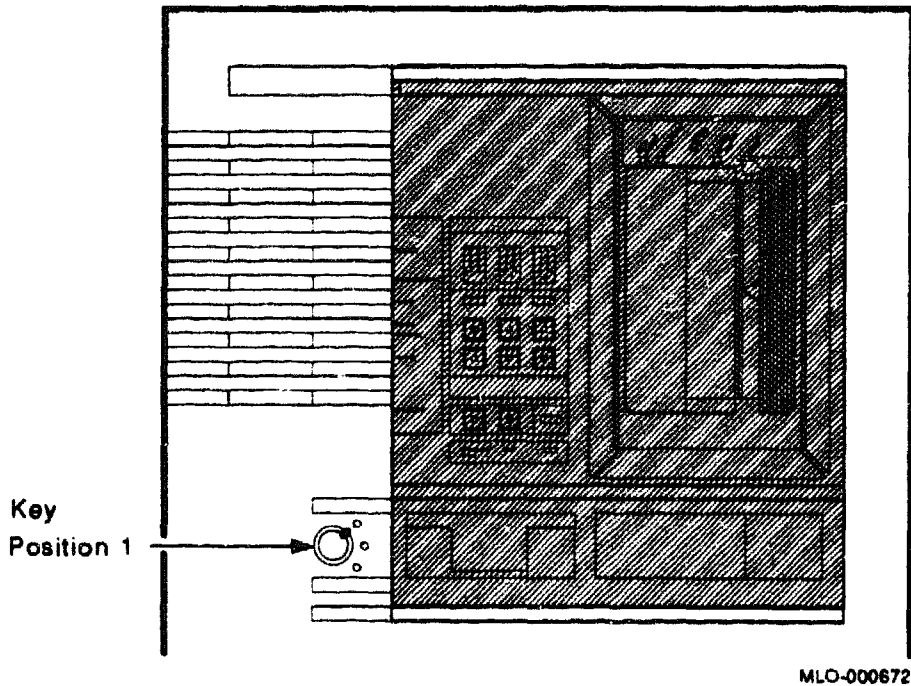
Figure 1-2: Key Positions



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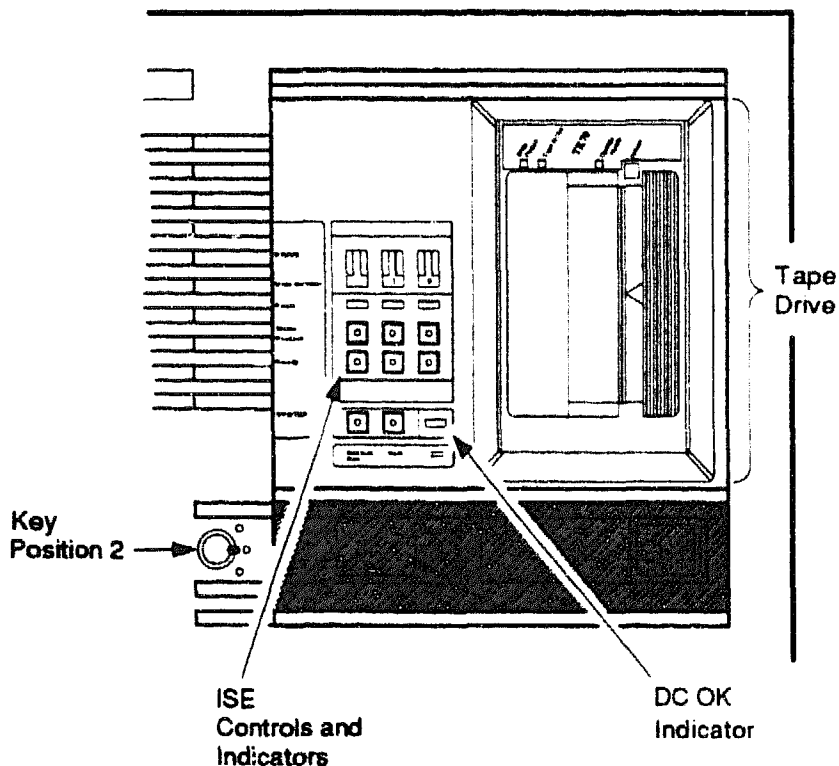
When the window is up and the key is turned to position 1, the window is locked in the closed position. You cannot use any controls when the window is closed, but indicator lights are visible through the window. Figure 1-3 shows the closed window and key position.

Figure 1-3: Sliding Window Closed



When the key is turned to position 2, you can open the window partially, as shown in Figure 1-4. With the window in this position you can access the tape drive and the controls on the Operator Control Panel (OCP). Chapter 3 has instructions for using these controls.

Figure 1-4: Window Partially Open

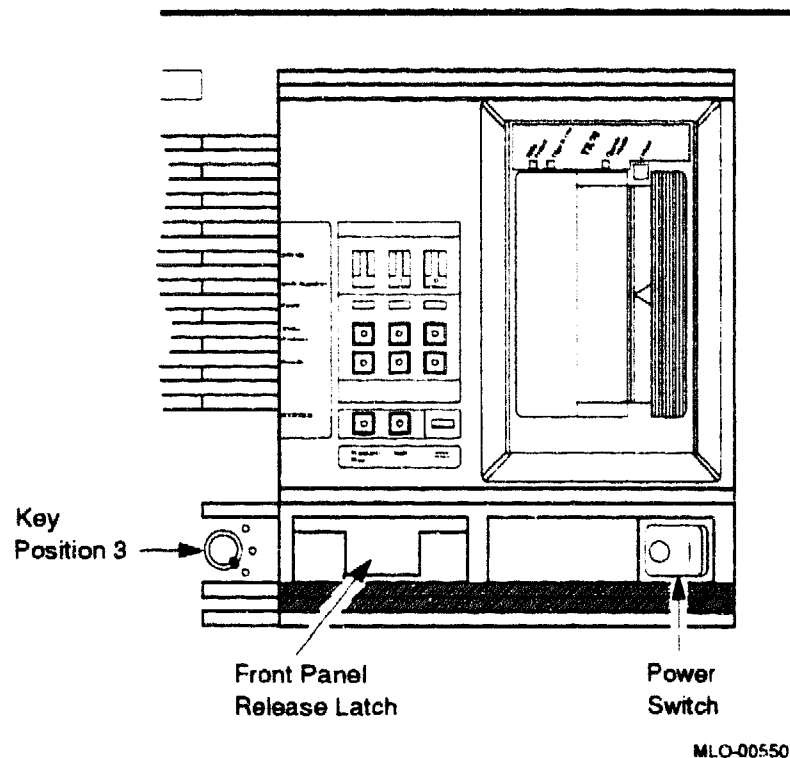


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When the key is turned to position 3, you can open the window fully, as shown in Figure 1-5.

When the window is fully open, you can turn the system on and off, and you can release the latch that locks the front panel.

Figure 1-5: Window Fully Open



Removing the Front Panel

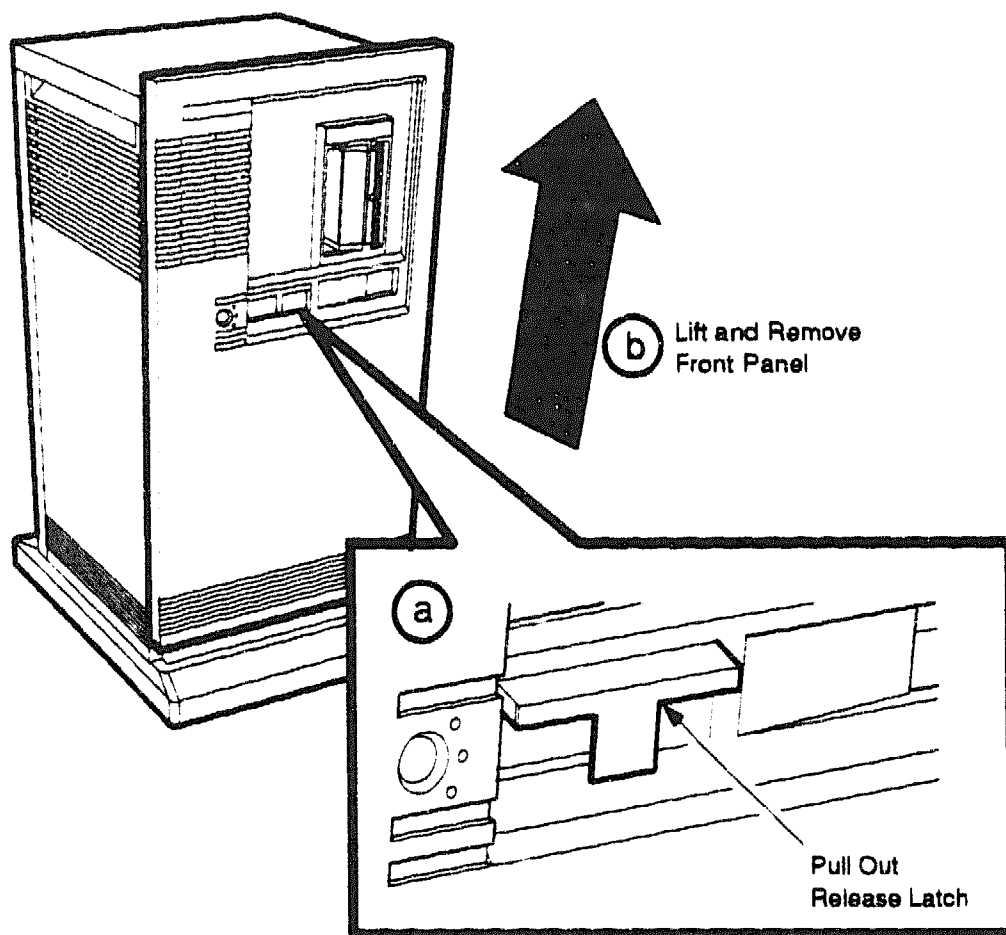
Remove the front panel to use the controls on the CPU cover panel and power supplies, as follows:

NOTE: *The window on the front panel must be open to remove and attach the front panel.*

1. Insert the key into the lock on the front cover. Turn the key to the bottom position. See Figure 1-6.
2. Slide the window down.
3. Pull the latch to the out position.

4. Lift the front panel up and out.

Figure 1-6: Removing the Front Panel



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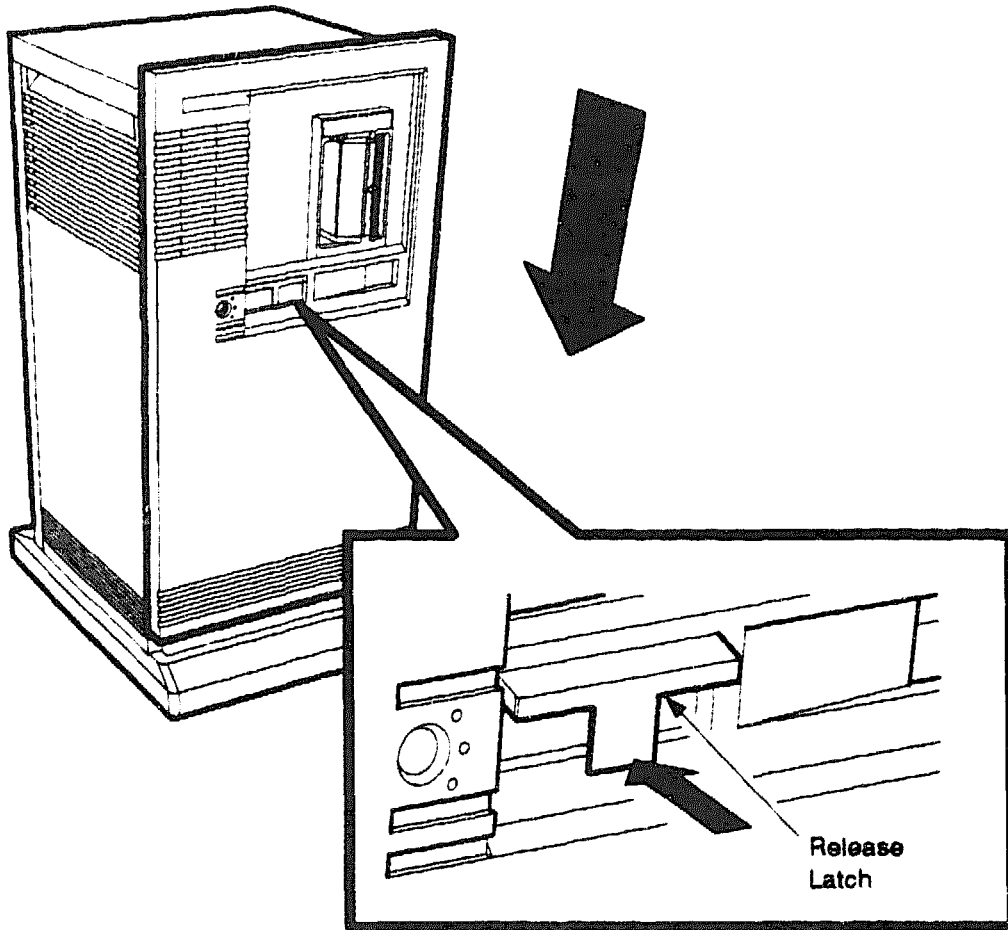
Attaching the Front Panel

NOTE: *The window on the front panel must be open to remove and attach the front panel.*

1. Pull the latch on the front panel to the out position. See Figure 1-7.
2. Holding the panel with two hands, place it flush against the front of the unit, about an inch from the bottom.
3. Slide the panel down until it locks into place.

4. Secure the panel by pushing in the latch.

Figure 1-7: Attaching the Front Panel



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The next section describes the BA215 enclosure, which is exposed when you remove the front panel.

1.1.1 BA215 Enclosure

Removing the front panel lets you see the components housed in the BA215 enclosure. Figure 1-8 shows a typical configuration.

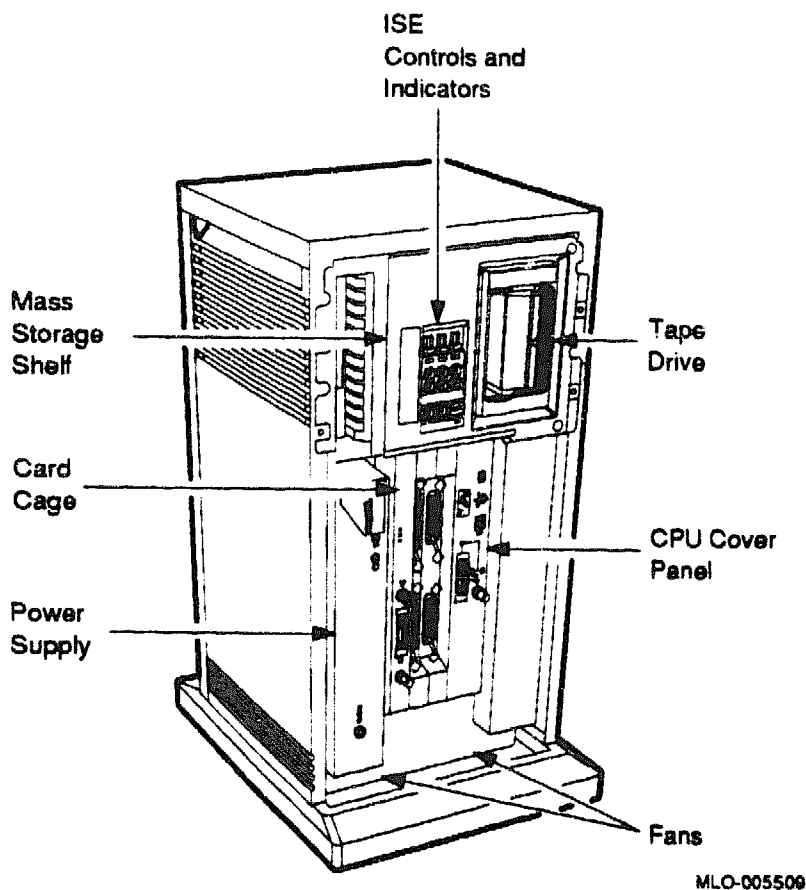
The BA215 enclosure can contain the following:

- Mass storage—TK-series tape drive and up to two RF-series Integrated Storage Elements (ISEs)

All VAX 4000 Model 200 (BA215) systems contain the following:

- Operator Control Panel (OCP)
- Card cage containing modules—CPU, memory, communications controllers, mass storage controllers
- CPU cover panel
- Power supply
- Fans

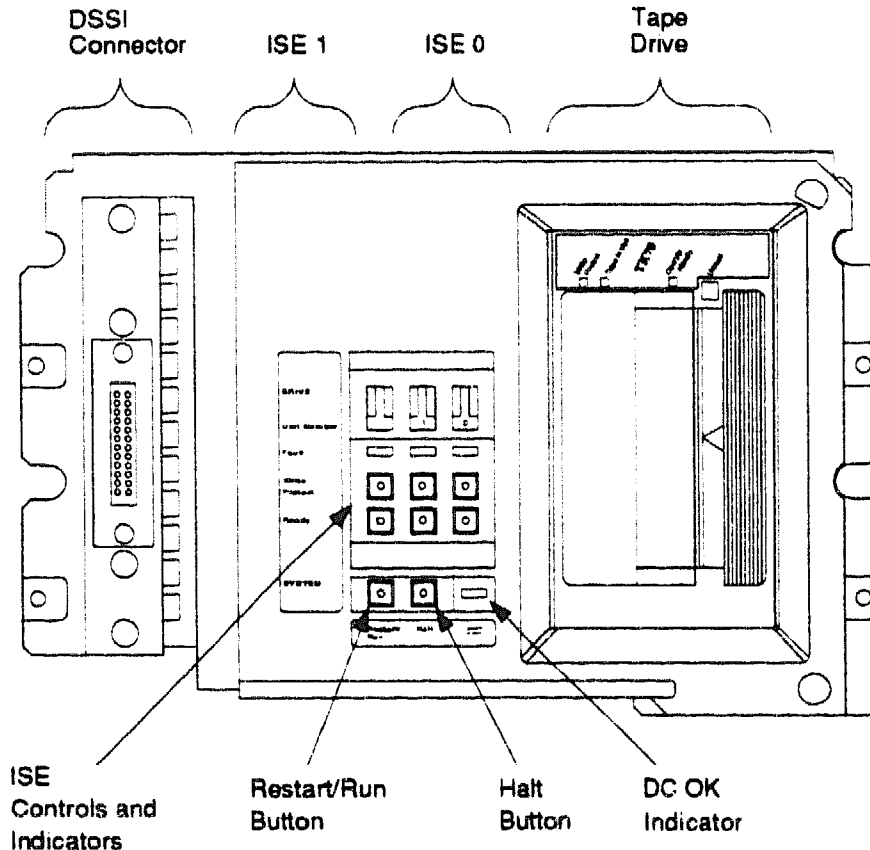
Figure 1-8: Front View of the BA215 Enclosure



1.1.1.1 Mass Storage Shelf

The mass storage shelf extends across the top of the enclosure. The shelf may contain a TK-series tape drive and one or two RF-series ISEs. The ISEs are behind the Operator Control Panel, as shown in Figure 1-9.

Figure 1-9: Mass Storage Shelf



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The Operator Control Panel has several buttons and indicators for each of the two possible drives. When you power up your system, indicator lights come on for each ISE. Chapter 3 describes how to operate the ISEs.

Below the ISE controls is the DC OK indicator. The green DC OK indicator shows that the power supply voltages are within the correct operating range. If the DC OK indicator is not lit when the system power is on, refer to the *VAX 4000 Model 200 Troubleshooting and Diagnostics* manual included in the Customer Hardware Information Kit.

To the left of the DC OK indicator is the Halt button. The Halt button is a two-position button. When you press the button, the system halts. A red indicator on the Halt button lights when the button is set to the in position. Before you can enter console commands, press the Halt button again to return it to the out position. When the Halt button is returned to the out position, the console mode prompt (>>>) is displayed on the console terminal screen. Now you can enter console commands. If you inadvertently press the Halt button, enter c to continue. Chapter 2 describes halting the system in more detail.

CAUTION: *Pressing 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/Run button. The Restart/Run button has a green indicator. When you press the Restart/Run button, the system returns to a power-up condition and self-tests are run. If you have specified a device as the boot device and if the Break Enable/Disable switch is set to disable, the system will reboot system software. Further instructions on restarting your system are in Chapter 2.

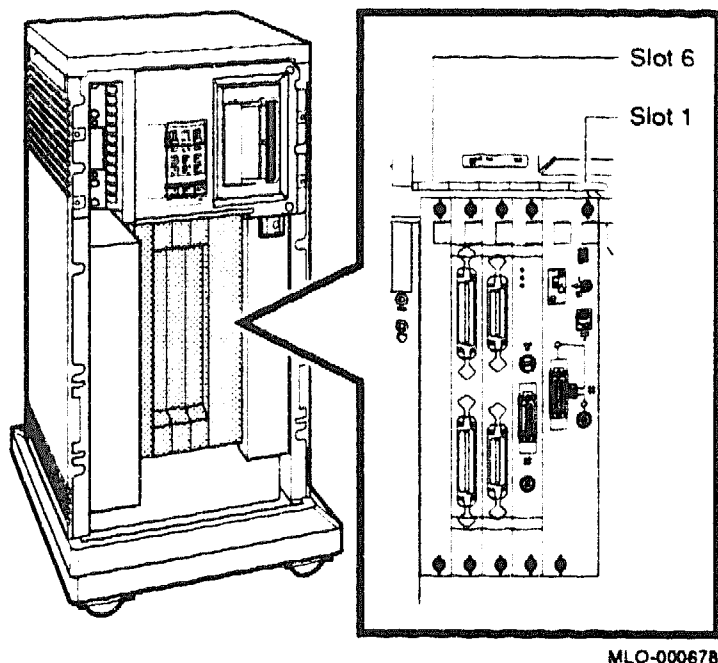
1.1.1.2 DSSI Connector

To the left of the operator control panel is the DSSI connector. The DSSI connector allows you to expand your system with additional RF-series ISEs by connecting a system expansion enclosure to the bus. You can also share ISEs with a second system by forming a dual-host configuration. Figure 1-9 shows the location of the DSSI connector.

1.1.1.3 Card Cage

The modules in your system are mounted in a 6-slot card cage under the mass storage shelf, as shown in Figure 1-10.

Figure 1-10: Card Cage



The first slot is reserved for the central processing unit (CPU). Up to four MS650 memory modules may follow the CPU. The CPU and the first memory module (slots 1 and 2) are covered by a dual-width CPU cover panel with system controls and connectors. The remaining slots are available for Q-bus option modules.

The number and type of modules installed in your system depend on your configuration. Each Q-bus slot, even an empty one, is protected by a module cover. The purpose of the shield is as follows:

- To protect external devices from electrical interference generated by the system
- To protect the system from electrical interference generated by external devices
- To maintain air flow integrity

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

Operating the system without the module covers has the following consequences:

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

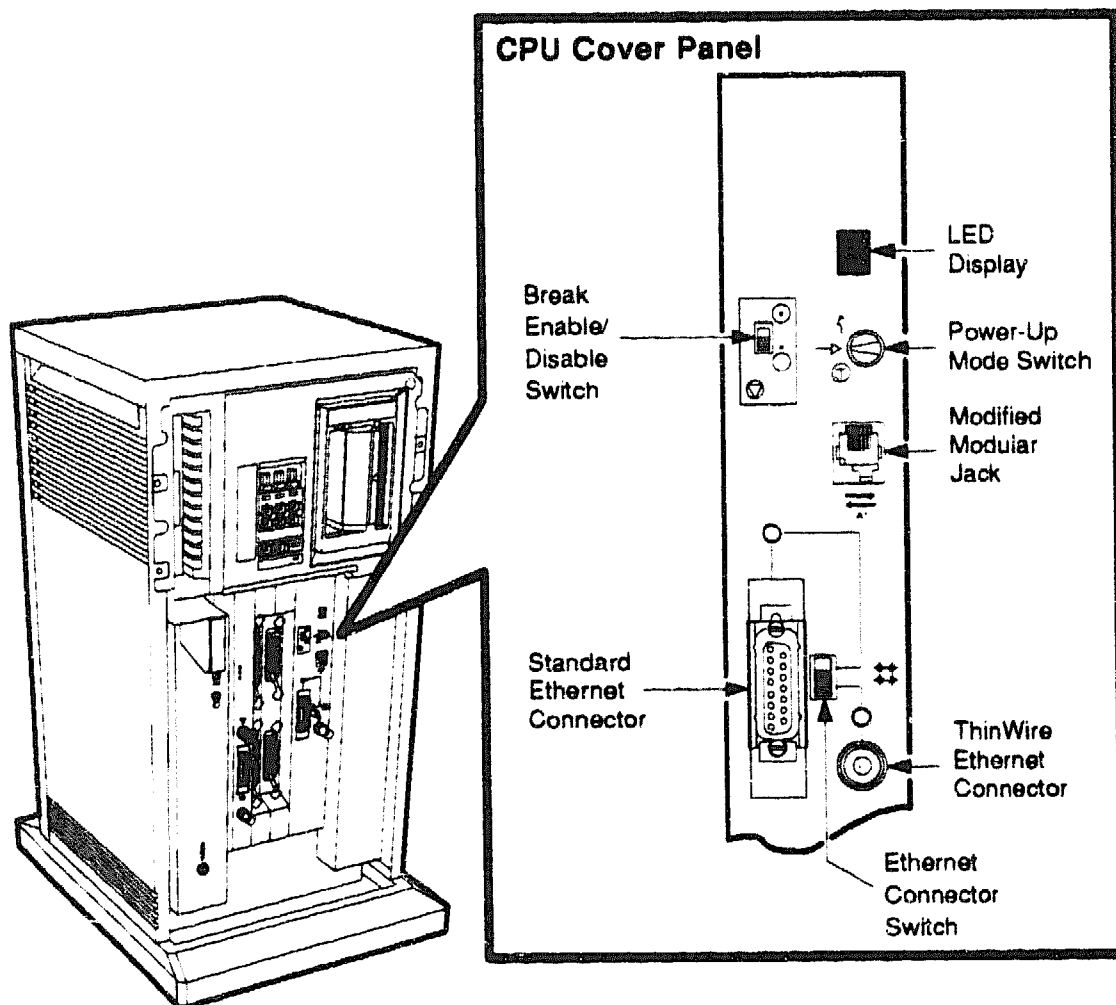
The design of the module covers varies, depending on the type of module installed in the slot. Modules requiring external cable connections, such as communications controllers, have recessed covers that are riveted directly to the module. The recessed module covers allow space for connecting cables. Modules requiring no external cable connections are covered by flush covers. Empty slots are also covered by flush covers, which may be single or double width. All covers, 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 under the BA215 enclosure and out the back or side of the enclosure, where the cables are split into individual lines. Chapter 3 describes these connections in more detail.

1.1.1.4 CPU Cover Panel

The CPU module and the first memory module are behind a double-width cover panel that has internal cable connections to the memory module(s). Figure 1-11 shows the CPU cover panel.

Figure 1-11: CPU Cover Panel



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The CPU cover panel has the following components:

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



Language Inquiry Mode (in the top position, indicated by a profile of a face) 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 (in the middle position, indicated by an arrow) is the normal operating setting.



Loop Back Test Mode (in the bottom position, 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 Customer Services use only.



Modified modular jack (MMJ)—This console terminal connector provides the connection for the console terminal.



The light-emitting diode (LED) display shows the testing sequence during power-up.



Break Enable/Disable switch—When the switch is down (dot outside the circle), breaks are disabled. When the switch is up (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. Using the console command SET CONTROLP, you can specify the control character, **Ctrl/P**, rather than **Break** to initiate a break signal.

The Break Enable/Disable switch also controls what happens at power-up. When breaks are disabled (down, dot outside the circle), the system attempts to automatically boot software at power-up. When breaks are enabled (up, dot inside the circle), the system enters console mode (indicated by the (>>>) prompt) at power-up.

Using the console commands, SET HALT REBOOT and SET HALT RESTART_REBOOT, you can set your system to override the Break Enable/Disable switch and automatically boot software after an error halt condition or power-up, even if breaks are enabled.



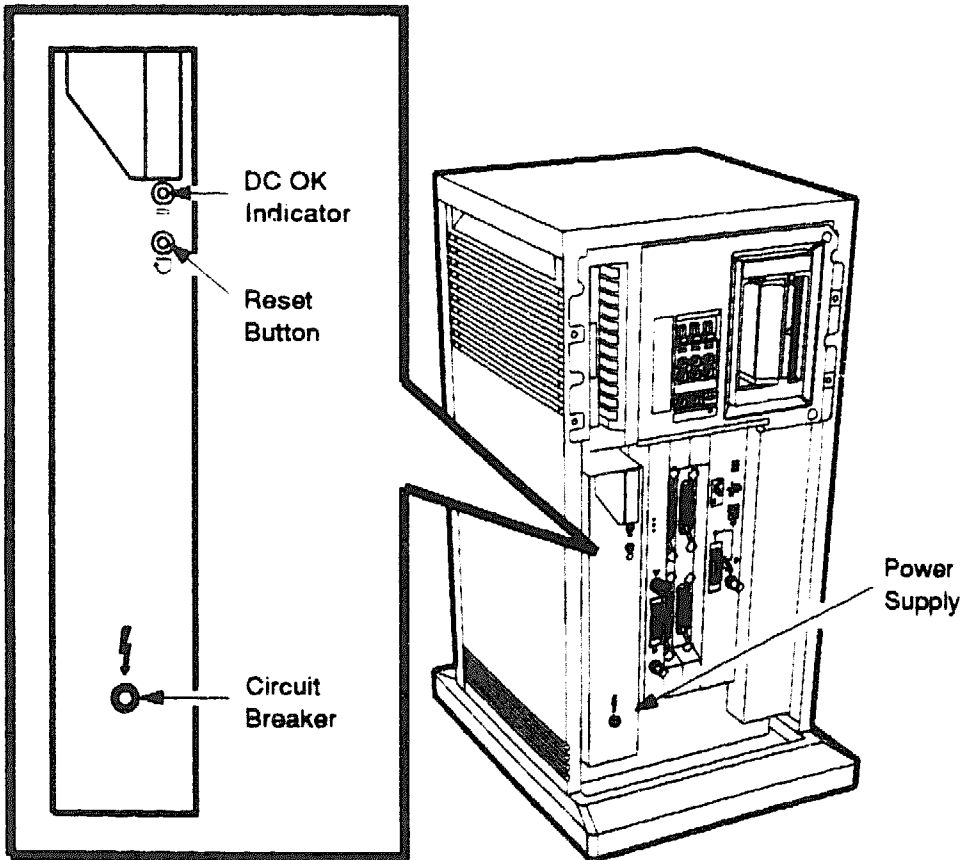
Ethernet connectors—The CPU cover panel has two Ethernet connectors: a BNC-type connector for ThinWire Ethernet and a 15-pin connector for a standard Ethernet transceiver cable. The Ethernet connector switch allows you to set the type of connection. To use the standard transceiver cable connection, set 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.

1.1.1.5 Power Supply Controls and Indicators

To the left of the card cage is the power supply. The power supply provides power to the mass storage devices, the modules installed in the card cage, and the fans.

Figure 1-12 shows the controls and indicators on the power supply.

Figure 1-12: Power Supply Controls and Indicators



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The controls and indicators function as follows:



DC OK—When the green DC OK indicator is lit, the power supply voltages are within the correct operating range. If the DC OK indicator does not light when the power switch is set to on, refer to your *VAX 4000 Model 200 Troubleshooting and Diagnostics* manual.



Reset Button—A recessed Reset button lets you reset the system to a power-up state without having to turn the system off. The Reset button is recessed to prevent you from inadvertently resetting the system. Use your fingertip or a small tool to press the button. See Chapter 2 for the correct procedures for resetting the system.

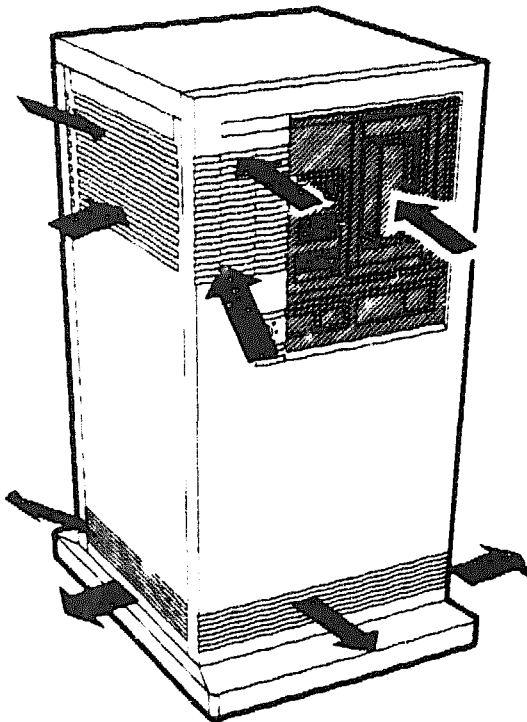


Circuit Breaker—The circuit breaker trips to protect the system from power surges. When tripped, the circuit breaker is in the out position. To reset the breaker, press the circuit breaker to the in position.

1.1.1.6 Fans

Two fans located under the card cage draw air in through the top of the enclosure, down through the card cage, and out the bottom. The speed of the fans varies, depending on the surrounding room temperature. To reduce the load on the fans, keep the system away from heat sources. Figure 1-13 shows the air flow through the system enclosure.

Figure 1-13: System Air Circulation



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1.2 Functional Description of Base System

Each VAX 4000 system includes base system components common to all systems. Your system may have optional components as well. Your system was 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
- Network controller
- Embedded DSSI host adapter

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 connecting the console terminal to the system. The SLU connector (a modified modular jack) 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 electrical 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. A large main memory increases the efficiency of processing, since fewer pages must be copied to and from the disk. Each configuration comes with a standard memory option. There is room for up to four memory modules. By adding more main memory, you can 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 integrated storage elements and tape cartridges, to store software and data permanently.

1.2.1.4 Network Controller

Network communications controllers allow you to connect to an Ethernet network. 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. Your system comes with an onboard Ethernet controller that is part of the CPU. The system can connect to an Ethernet network through either standard Ethernet cable or ThinWire Ethernet cable. Connectors for both types of cables are on the CPU cover panel.

1.2.1.5 Embedded DSSI Host Adapter

Your system has a Digital Storage Systems Interconnect (DSSI) adapter built into the CPU. The DSSI adapter provides a DSSI bus through which the CPU communicates with the RF-series ISEs. A DSSI bus can support seven RF-series ISEs.

The DSSI host adapter also allows you to link the DSSI bus to a second host to form a dual-host configuration. When a DSSI bus is extended to a second system, both systems can share up to six ISEs. Refer to Section 1.3 for further discussion of dual-host systems.

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 ISEs) and the following kinds of options:

- Mass storage devices and controllers
- Mass storage subsystems
- Mass storage expanders
- Communications controllers and adapters
- Real-time controllers
- Printer interfaces

1.2.2.1 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 transfers it from the mass storage device into main memory. The two primary types of mass storage devices are the RF-series ISEs and devices with removable media, such as tape cartridges and compact discs.

Integrated Storage Elements

Up to two RF-series ISEs can be installed in your system, providing there is no internal tape drive. An ISE is an intelligent storage device that contains its own controller and Mass Storage Control Protocol (MSCP) server.

Devices with Removable Media

Devices with removable media, such as tape cartridges, are used as both input and output devices. In addition, compact optical disks are used as input devices when you install software or copy data to your system. You use tape cartridges and tapes 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 are commonly used to archive data.

Mass Storage Controllers and Adapters

All mass storage devices require a controller, a device that controls activity between the CPU and the mass storage devices. While the controller for each RF-series ISE is built into the storage element, other storage options require a controller module located in your system's card cage. The controller for the TK70 tape drive is the TQK70; the KDA50 is a controller for RA-series disk drives. Each KDA50 controller supports up to four RA-series disk drives.

The KZQSA controller allows the CPU to communicate with a TLZ04 tape drive or an RRD40 compact disc drive. Each KZQSA controller can support up to two drives.

The CPU communicates with the ISEs through a Digital Storage Systems Interconnect (DSSI) adapter, which is built into the CPU. A DSSI bus is capable of supporting seven integrated storage elements. A second DSSI bus can be added to your system by using a KFQSA DSSI storage adapter module. The KFQSA storage adapter can support up to seven RF-series ISEs.

1.2.2.2 Mass Storage Subsystems

Several optional mass storage subsystems are available for VAX 4000 systems. Such subsystems include RRD40 Compact Disc Drive Subsystems, the RV20 Optical Disk Subsystem, TSV05 and TU81E tape drives, and the SA600 Storage Array (with up to eight RA90 disk drives). If your system includes an optional mass storage subsystem, refer to the user's guide or owner's manual for that subsystem for instructions on how to operate the device.

1.2.2.3 Mass Storage Expanders

You can expand the mass storage and Q-bus capacity of your VAX 4000 system by using expanders. The R400X mass storage expander provides space for up to seven additional RF-series ISEs or up to six RF-series ISEs and a TLZ04 tape drive. The R215F expander provides space for up to three RF-series ISEs.

The B400X expander provides 11 additional Q-bus slots for a system total of 17 Q-bus slots. The B400X also has space for up to four additional RF-series ISEs or up to three ISEs and a TLZ04 tape drive. The B213F expander also provides 11 additional Q-bus slots and provides space for up to three RF-series ISEs. Contact your Digital representative for more information on these and other expander products.

1.2.2.4 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 ends of the line. At the transmitting end, the modem converts digital signals from the computer (or terminal) to analog signals before transmission. At the receiving end, another modem converts the analog signals back into digital signals the computer can process.

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 11 signals. The CXY08 module supports up to 8 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 LAN or other network type. 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. The network

controller function for your system is implemented on the CPU module, but a second network controller, the DESQA Ethernet adapter module, can be added to your system.

1.2.2.5 Real-Time Controllers

Real-time controllers interface with devices that monitor or control particular processes; for example, laboratory equipment or manufacturing equipment connected to the system. Typically, real-time controllers are parallel devices, not serial devices.

1.2.2.6 Printer Interfaces

Some printers require specific interfaces to communicate with the system. For example, the LG01, LG02, and LP25–LP29 printers require the LPV11–SA interface module.

1.2.2.7 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. *VAX 4000 Model 200 Technical Information* describes the options currently available for VAX 4000 systems. Digital provides installation for additional options that you order.

1.3 Dual-Host Capability (VMS Systems Only)

A dual-host system consists of two systems in a VAXcluster sharing their ISEs by way of a Digital Storage Systems Interconnect (DSSI) bus. Each system can have direct access to any of the ISEs in either system; this can include a shared common system disk.

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 systems. The system disk physically resides in one enclosure; however, both systems have equal access to the system disk and to any other DSSI mass storage device in either enclosure over a common DSSI bus.

A DSSI ISE, such as the RF31, has a built-in dual-host capability that allows it to connect to two DSSI host adapters. The DSSI storage adapter, embedded in the system's CPU, allows you to extend a DSSI bus by physically connecting it to a second system.

Using an external DSSI cable, any two DSSI-based systems can be connected to form a dual-host configuration. Figure 1–14 shows a dual-host configuration with two VAX 4000 systems.

NOTE: *Dual-host capability for VAX 4000 Model 200 systems is only supported under VMS (Version 5.4 and later) when the two systems are configured into the same VAXcluster.*

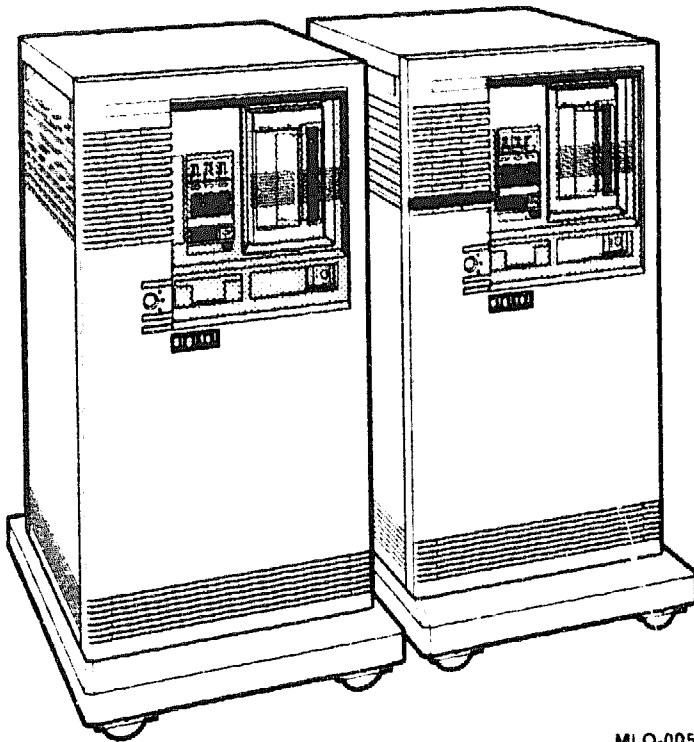
The benefits of a dual-host configuration are:

- VAXcluster features such as shared data across systems and satellite nodes.
- Higher system availability—If one of the DSSI-based systems is unavailable, for example, due to a system malfunction, the satellites booted through it are able to continue operating through the other system.

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

To increase system availability, a second system disk may be added to each boot node. In the event of one system disk failure, the remaining system disk would continue to serve one DSSI-based system and the satellite nodes booted through it. As with any VAXcluster, however, a second system disk improves availability while increasing system management tasks.

Figure 1-14: Dual-Host Configuration



MLO-005511

VAX 4000 Dual-Host Systems provides more information on dual-host configurations.

Chapter 2

Operating the System

This chapter describes how to operate your VAX 4000 Model 200 (BA215) system once the system software has been installed or you have completed startup procedures for factory-installed VMS.

2.1 Before You Operate the System

This chapter assumes that your system has been properly installed. Installation includes running the diagnostic software and installing the base operating system, or completing the first time startup procedures for factory-installed VMS. Refer to Appendix A of the *VAX 4000 Model 200 (BA215) Installation* manual for instructions on starting up factory-installed VMS. To install other 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 open the front door of the system to change switch settings on the CPU cover panel.

The remainder of this chapter assumes that system software has been installed and first time startup procedures for factory-installed VMS have been completed.

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 following:

- The Break Enable/Disable switch on the CPU cover panel is set to disable (down, dot outside the circle). Digital recommends you run the system with breaks disabled to prevent the user from inadvertently halting the system by pressing **Break** on the console terminal. Halting the system causes all activity to stop.

With breaks disabled, the system automatically boots system software when powered on.

NOTE: *You can use the console command SET CONTROLP to specify the control character, `CtrlP`, rather than `Break`, to initiate a break signal.*

Using the console commands, SET HALT REBOOT and SET HALT RESTART_REBOOT, you can set your system to override the Break Enable/Disable switch and automatically boot software after an error halt condition or power-up, even if breaks are enabled.

- The Power-Up Mode switch on the CPU cover panel is set to Run (indicated by an arrow).
- The baud rate switch inside the CPU cover panel is set to 9600.
- The Write-Protect button for each RF-series ISE is set to out (not lit). This setting allows system software to write to the storage element.
- The Ready button for each RF-series ISE is set to out (glows green when the storage element is not being used). This setting makes the storage element available for use (on-line).
- The Halt button on the SCP is set to out (not lit).

2.2.2 Special Operation

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

- 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, set the Break Enable/Disable switch to enable (up, dot inside the circle). This allows you to halt the system by pressing `Break` on the console terminal.

NOTE: *You can use the console command SET CONTROLP to specify the control character, `CtrlP`, rather than `Break`, to initiate a break signal.*

Using the console commands, SET HALT REBOOT and SET HALT RESTART_REBOOT, you can set your system to override the Break Enable/Disable switch and automatically boot software after an error halt condition or power-up, even if breaks are enabled.

- If you want data on a particular ISE to be write protected, you must set the Write-Protect switch to in (glows).

NOTE: *ISEs containing system software and user accounts must remain write enabled. ISEs containing applications or sensitive data may be write protected.*

- If you want to use the Language Selection Menu to select a new language for the console program, before you turn on your system, set the Power-Up Mode switch to Language Inquiry Mode. A human profile indicates the Language Inquiry Mode. When you turn on your system, a Language Selection Menu appears, as shown in Figure 2-1.

Figure 2-1: Language Selection Menu

KA660-A Vn.n VMB n.n

- 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) Português
 - 14) Suomi
 - 15) Svenska
- (1..15):

Select a language by typing in the number listed next to the language. Save the language you have selected by rotating the Power-Up Mode switch to Run Mode, indicated by an arrow.

NOTE: *If you do not select a language within 30 seconds, the system defaults to English (United States/Canada).*

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.

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

In addition to the Language Selection Menu, the system may issue a list of bootable devices and prompt you to select a device from the list. If this happens, refer to Section 2.4.1 for more information.

If your system has been powered off for more than 10 days, the battery unit that saves the system clock and the language selection may have run down. The Language Selection Menu will be automatically displayed when you power on your system, regardless of the Power-Up Mode switch setting. Once the system is booted, reset the system clock as described in your system software manual.

2.3 Turning On the System

Once you have set the switches correctly, you are ready to turn on the system. Use the following procedure:

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

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

Table 2-1: Normal Power-Up Indications

Indicator	Normal Indication
System DC OK indicators (power supply and SCP)	Glow green
AC Present indicator (power switch)	Glow orange
RF-series ISE Run/Ready indicators	Glow green steadily within 20 seconds
RF-series ISE Fault indicator	Lights temporarily at power-up.
TK70 tape drive indicators	Orange, yellow, and green lights glow during self-tests. The green light remains on.
TLZ04 tape drive indicators	Tape and drive indicators flash during self-tests. The drive indicator glows green when self-tests are successfully completed.

If you do not observe the indications in Table 2-1, refer to *VAX 4000 Model 200 Troubleshooting and Diagnostics*.

Every time you turn on your system, it runs a series of self-tests on the CPU and memory. Your console terminal first displays a line of information identifying the CPU, the version of the firmware, and the version of VMB—

the primary bootstrap program. In the sample screens provided in this chapter, the CPU is identified as a KA660-A, and the versions of the firmware and primary bootstrap are indicated as n.n. Your system will display actual version numbers. 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 Sections 2.4.1 and 2.4.2.

If your system detects an error during its self-tests, it displays an error summary consisting of several lines 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

```
KA660-A Vn.n VMB n.n

Performing normal system tests.
95..94..93..92..91..90..89..88..87..86..85..84..83..82..81..80..
79..78..77..76..75..74..73..72..71..70..69..68..67..66..65..64..
63..62..61..60..59..58..57..56..55..54..53..52..51..50..49..48..
47..46..45..44..43..42..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..

?58 2 02 FE 0004 0000 02          ; SUBTEST_58_02, DE_SHAC_RESET.LIS

P1=00000001 P2=00000000 P3=0000000F P4=00000000 P5=00000000
P6=00000000 P7=00000000 P8=00000000 P9=00000000 P10=00000000
r0=90000026 r1=00000000 r2=00000000 r3=00004200 r4=00000000
r5=00000000 r6=00004018 r7=20004000 r8=00004000 EPC=200618BC
Normal operation not possible.

>>>
```

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

2.4 Booting the System

VAX 4000 systems boot in one of two ways. You can configure the system to autoboot on power-up or you can manually boot the system from console mode. The Break Enable/Disable switch setting determines how the system boots.

2.4.1 Autobooting the System

When the Break Enable/Disable switch is set to disable (the normal operating setting), the system runs self-tests and, on completion, attempts to load system software. Additionally, if the Break Enable/Disable switch is set to enable, and the halt action REBOOT or RESTART_REBOOT has been defined using the SET HALT command, the system will automatically attempt to load system software.

Depending on whether or not a boot device has been selected, the system loads system software or prompts you to select a boot device.

Loading System Software (with Boot Device Selected)

When a boot device has been selected, the system identifies the boot device and the number 2 displays on the screen. As the system begins booting, the countdown continues from 1 to 0.

Figure 2-3 shows a successful power-up and automatic boot when DIA0 has been selected as the boot device.

Figure 2-3: Successful Power-Up and Automatic Boot

KA660-A Vn.n, VMB n.n

Performing normal system tests.

95..94..93..92..91..90..89..88..87..86..85..84..83..82..81..80..
79..78..77..76..75..74..73..72..71..70..69..68..67..66..65..64..
63..62..61..60..59..58..57..56..55..54..53..52..51..50..49..48..
47..46..45..44..43..42..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..

Loading System Software (No Boot Device Selected)

If you have not selected a boot device when the Break Enable/Disable switch is set to disable, the system runs self-tests and, on completion, issues a list of bootable devices. You are prompted to select a boot device from the list, as shown in Figure 2-4.

Figure 2-4: Successful Power-Up to List of Bootable Devices

KA660-A Vn.n VMB n.n

Performing normal system tests.

95..94..93..92..91..90..89..88..87..86..85..84..83..82..81..80..
79..78..77..76..75..74..73..72..71..70..69..68..67..66..65..64..
63..62..61..60..59..58..57..56..55..54..53..52..51..50..49..48..
47..46..45..44..43..42..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 has been specified.

Available devices.

-DIA0 (RF31)

-DIA1 (RF31)

-MUA0 (TK70)

-EZA0 (08-00-2B-06-10-42)

Device? [EZA0]:

To select a boot device, enter a device name at the system prompt. When you have selected a boot device, the system boots from that device. Figure 2-5 shows a successful power-up when DIA0 has been selected as the boot device. The next time the system is turned on, it will autoboot from the device you have just selected.

NOTE: *If you do not enter a device name within 30 seconds, the system attempts to boot from the Ethernet device, EZA0.*

Figure 2-5: Selecting a Bootable Device

KA660-A Vn.n VMB n.n

Performing normal system tests.

95..94..93..92..91..90..89..88..87..86..85..84..83..82..81..80..
79..78..77..76..75..74..73..72..71..70..69..68..67..66..65..64..
63..62..61..60..59..58..57..56..55..54..53..52..51..50..49..48..
47..46..45..44..43..42..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 has been specified.

Available devices.

-DIA0 (RF31)

-DIA1 (RF31)

-MUA0 (TK70)

-EZA0 (08-00-2B-06-10-42)

Device? [EZA0]:**DIA0**

(BOOT/R5:0 DIA0)

2..

-DIA0

1..C..

Changing the Boot Device

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

- Change the setting of the Break Enable/Disable switch to enable (up, dot inside the circle). If you do so, the system will not autoboot but will enter console mode after completing self-tests (assuming you have not defined a halt action of REBOOT or RESTART_REBOOT using the SET HALT console command). Refer to Section 2.4.2 for instructions on booting from console mode.
- Change the boot device by using the SET BOOT command.

Using the SET BOOT Command

To direct the system to boot automatically from a specific device or to change the setting of the default boot device, put the system into console mode and at the prompt (**>>>**), enter "SET BOOT *device-name*". For example,

```
>>>SET BOOT EZA0
```

sets the system default boot device to be the Ethernet controller.

Once you have selected a boot device, the system autoboots from that device each time you turn it on.

Using "SET BOOT *device-name,device-name,device-name*", you can also specify a string of default boot devices (up to 32 characters, with devices separated by commas and no spaces) for which the system will check for bootable software. The system checks the devices in the order specified and boots from the first one that contains bootable software. For example,

```
>>>SET BOOT DUA0,DIA0,MUA0,EZA0
```

directs the system to use DUA0, DIA0, MUA0, and EZA0 as the default boot devices. When the system autoboots, or if the BOOT command is used without specifying a device, the system will boot from the first default boot device that contains bootable software.

NOTE: *If included in a string of boot devices, the Ethernet device, EZA0, should only be placed as the last device of the string. The system will continuously attempt to boot from EZA0.*

To determine the name of the device from which to boot the system, refer to Table 2-2 or enter the SHOW DEVICE command at the console prompt (**>>>**). Figure 2-6 shows a sample list of devices. The system displays the logical device name, preceded by a dash (-), for each device.

NOTE: *Selecting a default boot device other than the Ethernet device, EZA0, is not appropriate for diskless and tapeless systems that must boot software over the network.*

Figure 2-6: Sample SHOW DEVICE Display

```
>>>SHOW DEVICE
DSSI Bus 0 Node 0 (CLYDE)
-DIA0 (RF31)
DSSI Bus 0 Node 1 (BONNIE)
-DIA1 (RF31)
DSSI Bus 0 Node 7 (*)
UQSSP Tape Controller 0 (774500)
-MUA0 (TK70)
SCSI Adaptor 0 (761400), SCSI ID 7
-MKA0 (DEC TL204 1989(c)DEC)
Ethernet Adapter
-EZA0 (08-00-2B-06-10-42)
```

Table 2-2: Device Names

Device Type	Controller/Adapter	Device Logical Name
RF-series ISE	Embedded DSSI host adapter (part of CPU)	Dimn ¹
RF-series ISE	KFQSA storage adapter	DUcn ²
TK-series tape drive	TQK70/TQK50	MUcn ³
TLZ04 tape drive	KZQSA adapter	MKAn
RRD40 compact disc drive	KZQSA adapter	DKAn
PROM (programmable read only memory)	MRV11 module	PRAn
Ethernet adapter	On-board (part of CPU)	EZA0
Ethernet adapter	DESQA Ethernet controller	XQAn
RA-series drives	KDA50	DUcn ²

¹m = DSSI bus adapter (A = first bus (0), B = second bus (1), and so on.)
n = unit number

When under operating system control, DIBn devices are recognized as DIAn devices.

²c = MSCP controller designator (A = first, B = second, and so on.)
n = unit number

³c = TMSCP controller designator (A = first, B = second, and so on.)
n = unit number

For more information about the VAX 4000 system's booting process, refer to *VAX 4000 Model 200 Technical Information*.

2.4.2 Booting the System from Console Mode

When the Break Enable/Disable switch is set to enable, the system powers up to console mode (indicated by the (>>>) prompt) after successfully completing its self-tests (assuming you have not defined a halt action of REBOOT or RESTART_REBOOT, using the SET HALT console command). Figure 2-7 shows a successful power-up to console mode.

Figure 2-7: Successful Power-Up to Console Mode

```
KA660-A Vn.n VMB n.n
```

```
Performing normal system tests.
```

```
95..94..93..92..91..90..89..88..87..86..85..84..83..82..81..80..  
79..78..77..76..75..74..73..72..71..70..69..68..67..66..65..64..  
63..62..61..60..59..58..57..56..55..54..53..52..51..50..49..48..  
47..46..45..44..43..42..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

To load system software from console mode, enter the BOOT command, "BOOT *device name*". For example,

```
>>>BOOT MUA0
```

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

If you enter the BOOT command without specifying a device, the system will attempt to boot from the default boot device or string of devices defined by the SET BOOT command.

Using "BOOT *device-name,device-name,device-name*", you can also specify a string of boot devices (up to 32 characters, with devices separated by commas and no spaces) for which the system will attempt to boot software. The system checks the devices in the order specified and boots from the first one that contains bootable software. For example,

```
>>>BOOT DUA0,DIA0,MUA0,EZA0
```

directs the system to boot from the first device in the list that contains bootable software.

NOTE: *If included in a string of boot devices, the Ethernet device, EZA0, should only be placed as the last device of the string. The system will continuously attempt to boot from EZA0.*

NOTE: *To determine the name of the device from which to boot the system, refer to Table 2-2.*

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 manuals and application manuals for more specific instructions on using the system.

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 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.
- If the Break Enable/Disable switch on the CPU cover panel is set to enable (up, dot inside the circle), you can press the **Break** key on the console terminal. If the Break Enable/Disable switch is not set to enable and you wish to halt the system by pressing **Break**, change the setting of the Break Enable/Disable switch from disable to enable.

NOTE: You can use the console command *SET CONTROLP* to specify the control character, **Ctrl/P**, rather than **Break**, to initiate a break signal.

CAUTION: If you shut off your console terminal while breaks are enabled, the system interprets the action as a break, and the system halts.

If you are using a system that is part of a VAXcluster, do not halt, restart, or turn off the system without consulting the cluster manager. Performing any of these activities will interrupt the processes of the entire cluster.

When the console mode prompt (**>>>**) is displayed on your screen, the system is halted.

If you inadvertently halt the system, enter **c** **Return** at the console prompt. The processes interrupted by the halt will continue.

2.7 Restarting the System

NOTE: Restarting the system aborts all current and pending operations. To prevent loss of data, warn all users to log off before restarting the system. Follow the shutdown procedure described in your system software manuals before restarting the system.

Restarting returns the system to a power-up condition. All current and pending operations are aborted and the usual power-up tests are run.

You restart the system by pressing the Restart/Run button on the operator control panel.

NOTE: The Halt button must be out (not lit) to effect a restart operation.

2.8 Turning Off the System

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 power switch to 0.

Operating the System Options

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

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

NOTE: *Some variants of these options may not be appropriate for VAXserver 4000 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 included with VAX 4000 systems:

- RF-series Integrated Storage Element (ISE)
- TK-series tape drive

NOTE: *In addition, the RV20 Optical Disk Subsystem, RRD40 Compact Disc Drive Subsystem, and TSV05 and TU81E tape drives can be attached to the VAX 4000 system. If your system contains one of these options, refer to the user's guide or owner's manual for instructions on how to operate the device.*

This chapter describes how to use the controls for the RF-series ISEs and the TK70 tape drives. In the case of the tape drives, it also describes how to insert and remove the tape cartridge. 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 RF-Series Integrated Storage Elements

Your system may have up to two RF-series ISEs. When your system has multiple ISEs, Digital recommends that you separate them according to function. For example, if your system has two ISEs, you may want to use them as follows:

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

The storage capacities and other specifications for RF-series ISEs are listed in *VAX 4000 Model 200 Technical Information*.

Refer to Appendix B of this manual for information on setting or examining internal parameters for RF-series ISEs.

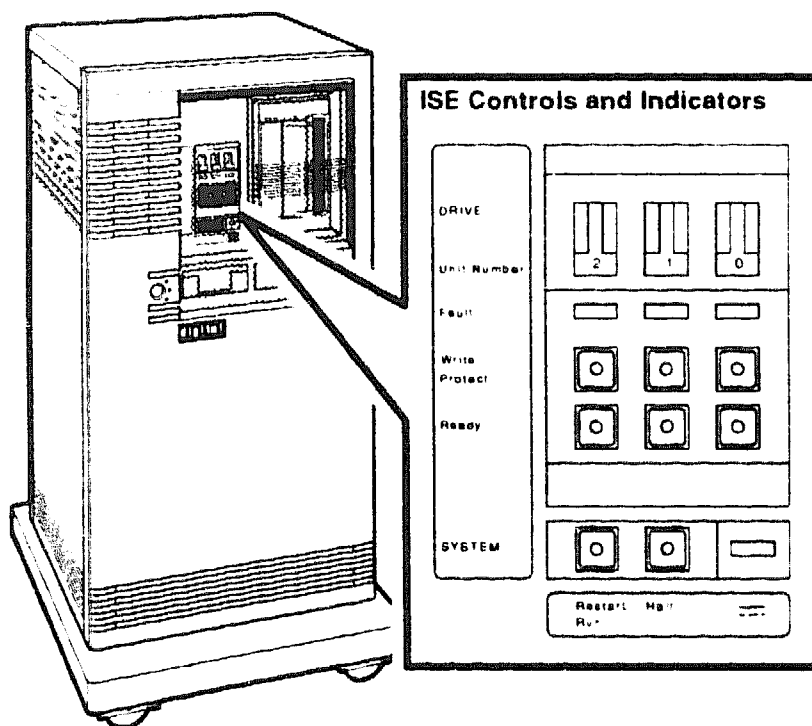
RF-Series Controls and Indicators

Controls for the RF-series ISEs are located on the Operator Control Panel (OCP) behind the sliding window on the front of the system. To access the controls on the OCP, you must turn the key to position 2 or 3 and slide down the window. Figure 3-1 shows the OCP.

The system has controls and indicators for three RF-series ISEs, however, only two ISEs can be used with the BA215 system enclosure. Each ISE has the following controls and indicators arranged in columns on the control panel:

- Bus node ID plug
- Fault indicator
- Write-Protect button
- Ready button

Figure 3-1: Operator Control Panel



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Bus node ID plugs identify the bus node number of the ISEs to the system, as well as the unit number by default. Bus node numbers are configured at the factory in consecutive order from right to left: the rightmost ISE as 0, the ISE on the left as 1.

Table 3-1 lists RF-series controls and indicators.

Table 3-1: RF-Series Controls and Indicators

Control	Position	Function
Bus Node ID Plug	Installed	The bus node ID plug identifies the bus node ID number of the ISE to the system and is, by default, the unit number. The ISE bus node ID is factory set to a number 0 through 6.
	Not Installed	The ISE bus node number is undefined. The ISE fault indicator lights.

Table 3-1 (Cont.): RF-Series Controls and Indicators

Control	Position	Function
Fault	Lit	Indicates an error condition in the ISE. The light is on temporarily during power-up sequence (normal condition).
	Not lit	Indicates an error-free condition in the ISE.
Write-Protect	In (lit, amber)	ISE is write protected. Prevents system software from writing to the ISE.
	Out (not lit)	ISE is not write protected. Normal position for software operation. System software is free to read from or write to the ISE.
Ready	Out (lit, green)	ISE is on line. When the ISE is available for use, the green indicator light in the switch is on. Under normal operation the green indicator flashes as seek operations are performed.
	In (not lit)	ISE is off line 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 ISE. The system can read from the ISE regardless of the setting of the Write-Protect button. When the Write-Protect button is out (not lit), the system can write to the ISE. Your system disk (the ISE containing system software) and ISEs containing work areas for users should be write enabled, the normal operating setting.

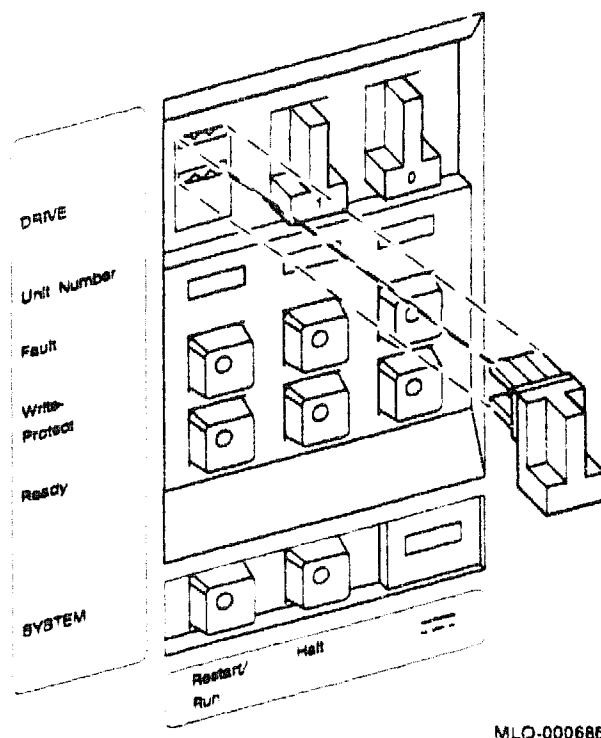
If you want to write-protect an ISE containing sensitive data that you do not want changed or accidentally erased, set the Write-Protect button to in (lit).

Changing the Bus Node ID Plugs

Spare bus node ID plugs are supplied with your system. Use the spare plugs to renumber your ISEs if you reconfigure your system with an R400X expander, or if you create a dual-host configuration.

The bus node ID plugs have prongs on the back that indicate the bus node number (and by default, the unit number) of the ISE. To remove a bus node ID plug, grasp it firmly and pull straight out. To insert a bus node ID plug, align the two center prongs with the two center slots and press the plug into the slots. See Figure 3-2.

Figure 3-2: Inserting Bus Node ID Plugs



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Use the rules below for renumbering your storage elements:

- For each DSSI bus, do not duplicate bus node numbers for your storage elements. You can have only one storage element identified as bus node 0, one storage element as 1, and so on.
- By convention, the ISEs are numbered in increasing order from right to left.

NOTE: *If you change the bus node ID plugs while the system is operating, you must turn off the system and then turn it back on for the new plug addresses to take effect.*

3.1.2 TK70 Tape Drive

The TK70 tape drive is located behind the upper door of the system. To use the drive, move the key to the top position and open the door.

The TK70 tape drive holds one removable magnetic tape cartridge. The drive can read data written on either a CompacTape II or CompacTape

cartridge. You can 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 drive or a TK50 drive. (The TK50 drive records data in a format different from that of the TK70.)

You should 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 previously written to by a TK50 tape drive.

TK70 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 tell you the status of the drive.

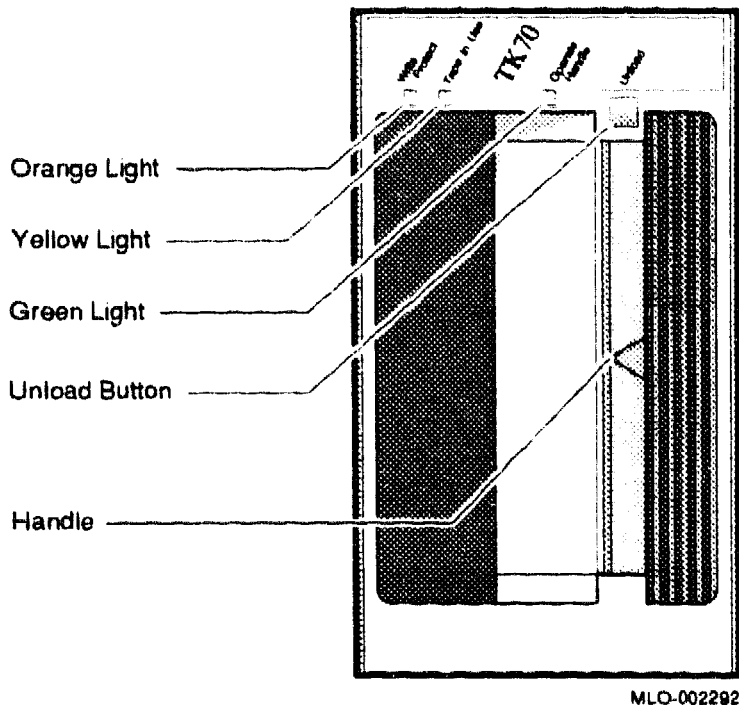
- **Orange light (Write-Protected):** A steady orange light indicates that the cartridge is write protected.
- **Yellow light (Tape in Use):** A steady yellow light indicates that the tape is loaded. A blinking yellow light indicates that the tape is in motion.
- **Green light (Operate Handle):** A steady 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 indicate a fault condition.

Figure 3-3 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 you what should happen at each step. A table at the end of the section summarizes light and control combinations.

Figure 3-3: TK70 Tape Drive



3.1.2.1 Design of the Drive

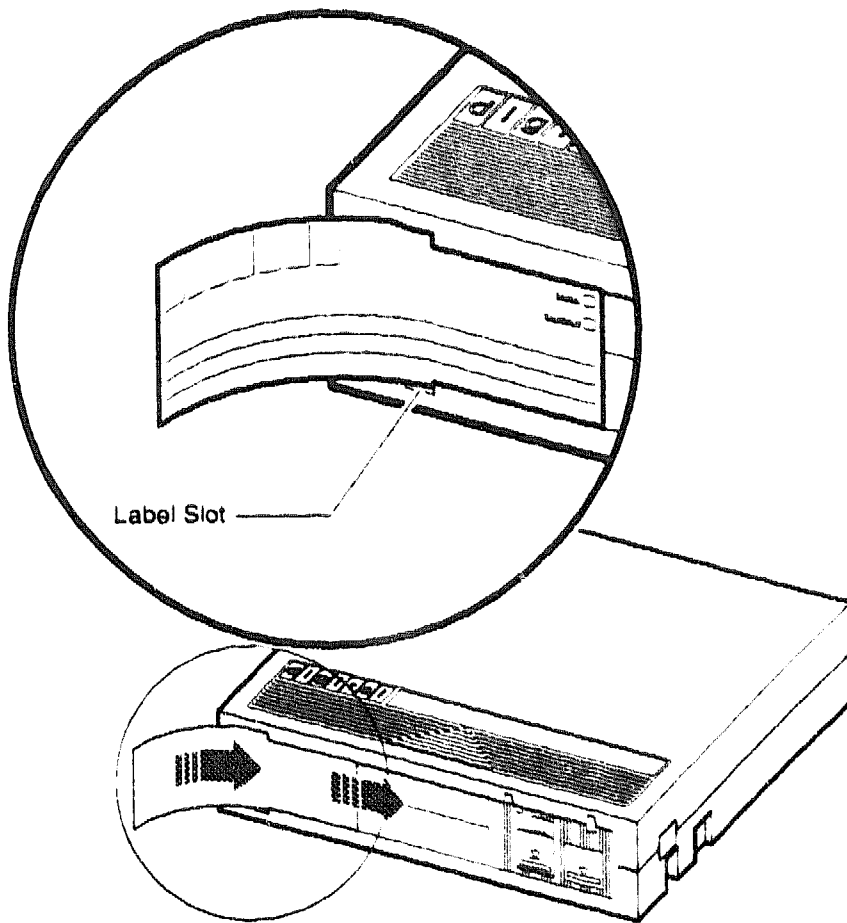
The TK70 tape drive operates like a reel-to-reel tape deck. Inside the drive is a take-up reel with a leader attached. Inside the cartridge is a single reel containing the magnetic tape. When you insert the cartridge and push in the handle, the leader in the drive automatically couples with the leader 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, you must unload it before you can remove the cartridge. When you press the Unload button, the tape rewinds into the cartridge and the leaders uncouple.

3.1.2.2 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 3-4. The label is visible when the tape is in the drive.

Figure 3-4: Labeling a Tape Cartridge



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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.*

3.1.2.3 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 3-5. 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.

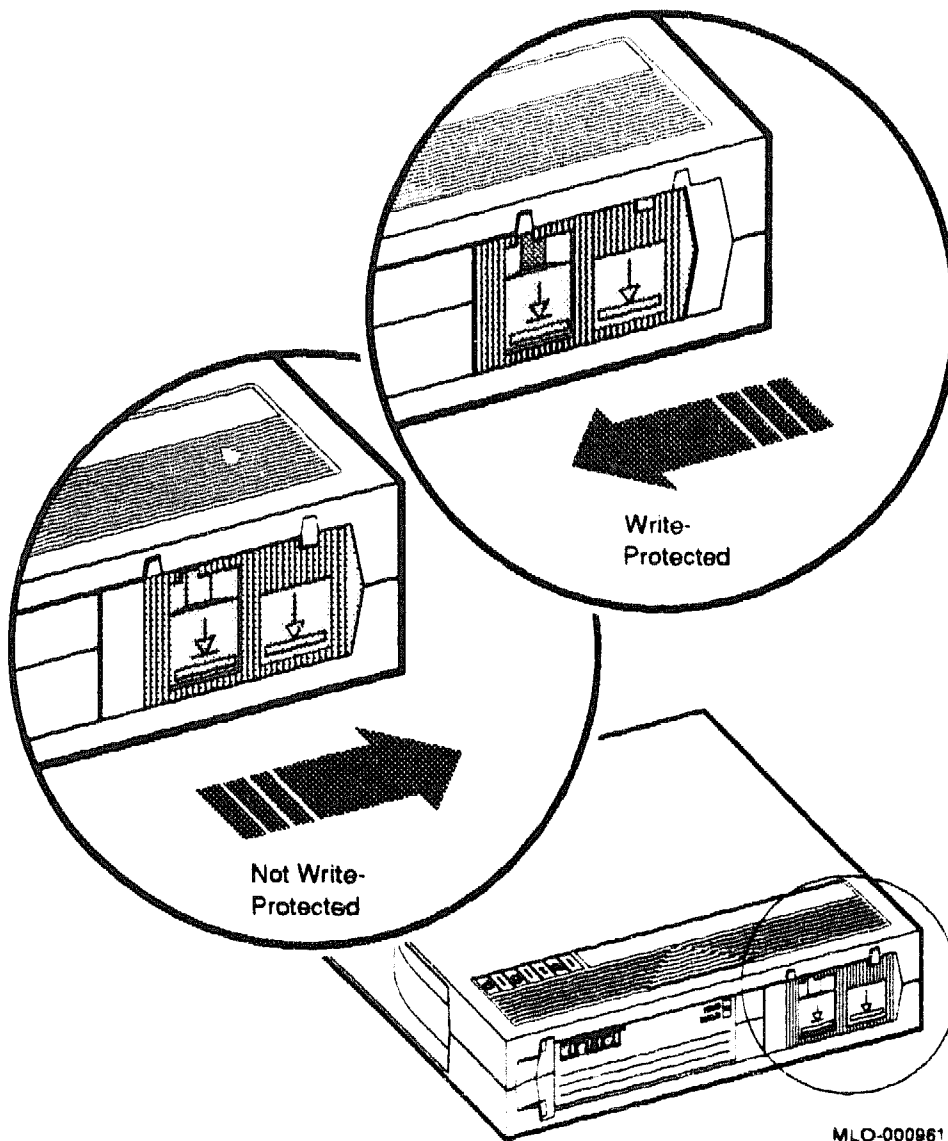
When you insert a write-protected cartridge into the drive, the orange indicator light comes on. The system recognizes the tape as being write-protected under any one of the following conditions:

- 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.

Figure 3-5: Tape Cartridge Write-Protect Switch



- 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.

3.1.2.4 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°C (50° and 104°F).
- 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.

3.1.2.5 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 TK70 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 3-6):

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 TK70 tape drive until you feel the cartridge lock into place.
3. Push the handle closed.

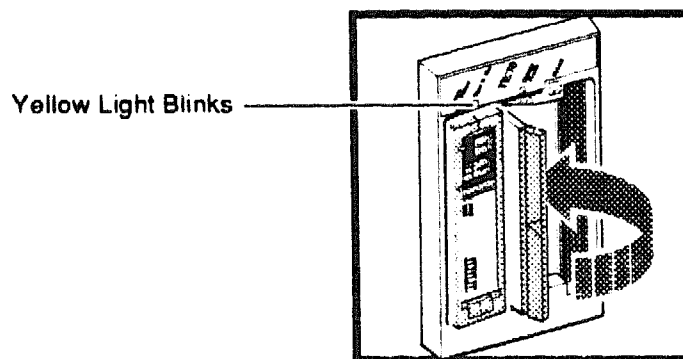
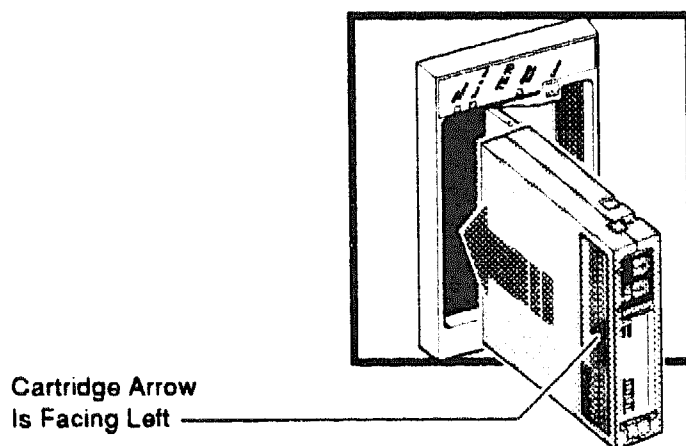
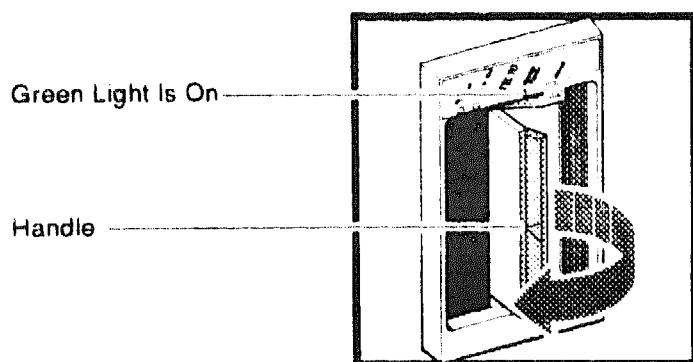
The green light goes off and the yellow light blinks as the tape loads. When the yellow light glows steadily, the tape is ready to use.

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.*

Refer to Appendix C of this manual for instructions on how to create backup files on a tape cartridge.

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.*

Figure 3-6: Inserting a Tape Cartridge



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3.1.2.6 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 3-7):

1. Press the Unload button. You can also issue a software command 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.

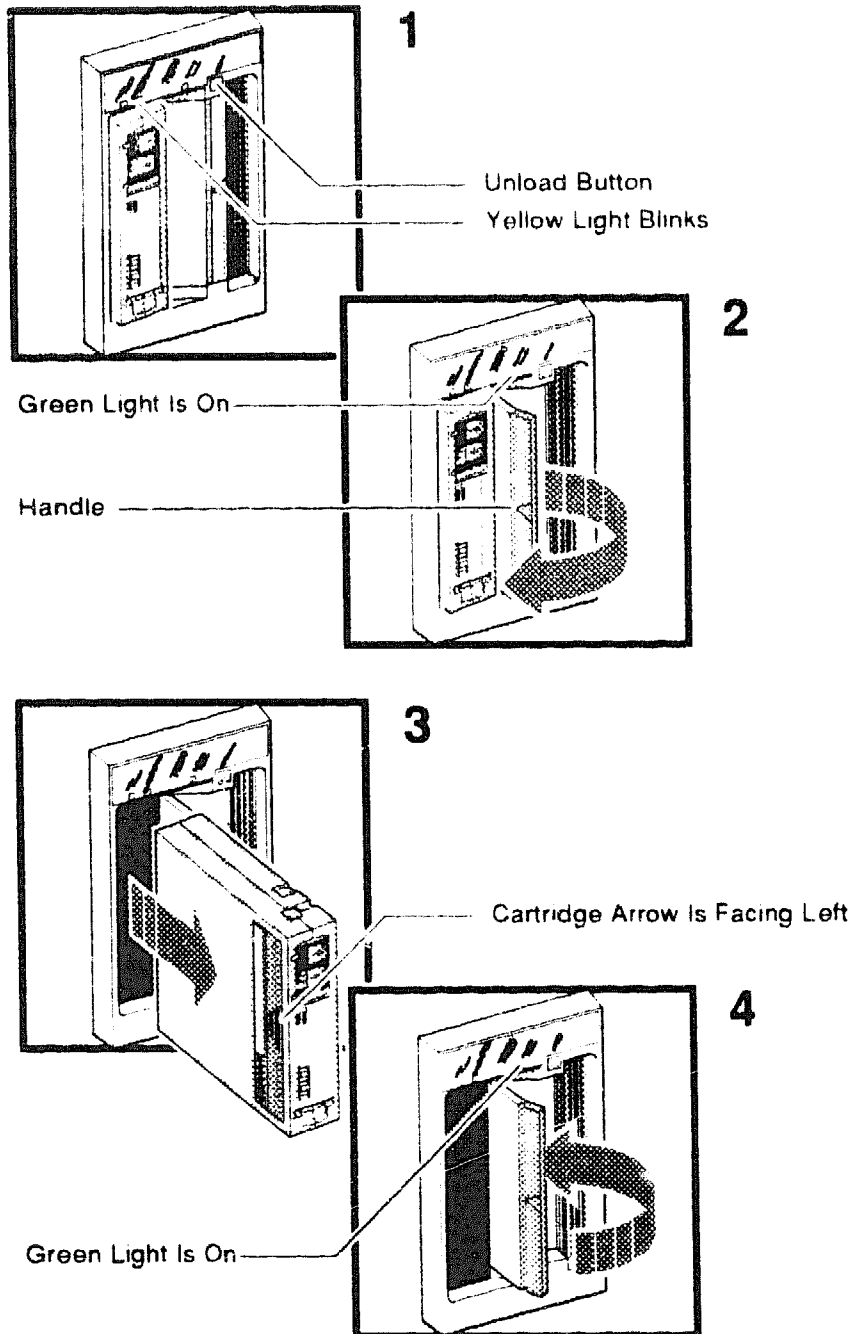
CAUTION: *Move the handle only when the yellow indicator light is off and the green indicator light is on. Moving the handle while the yellow light is blinking could damage the drive.*

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 3-7: Removing a Tape Cartridge



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3.1.2.7 Summary of TK70 Tape Drive Controls and Indicator Lights

Table 3-2 summarizes the TK70 tape drive controls. Table 3-3 describes the meaning of the indicator lights.

Table 3-2: TK70 Tape Drive 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 3-3: TK70 Tape Drive 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.
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.

3.1.3 RV20 Optical Disk Subsystem

If your system includes an RV20 Optical Disk Subsystem, refer to the *RV20 Optical Disk Subsystem Owner's Manual* for instructions on how to operate the device.

3.1.4 RRD40 Compact Disc Drive Subsystem

If your system includes an RRD40 Compact Disc Drive Subsystem, refer to its user's guide for instructions on operating the device.

3.1.5 TSV05 Tape Drive

If your system includes a TSV05 tape drive, refer to the *TSV05 Tape Transport System User's Guide* for instructions on how to operate the device.

NOTE: *The TSV05 is a data interchange device and is not supported as a backup device.*

3.1.6 TU81E Tape Drive

If your system includes a TU81E tape drive, refer to the *TU81-Plus Tape Subsystem User's Guide* for instructions on how to operate the device.

3.2 Communications Controller Options

The following types of communications controllers are available for the VAX 4000 systems:

- 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 for your VAX 4000 system, with and without modem support:

- CXA16—16-line multiplexer, Q-bus controller
- CXB16—16-line multiplexer
- CXY08—8-line multiplexer with modem control, Q-bus controller
- DFA01—2-line controller with integral modems, Q-bus controller
- DSRVB—8-line terminal server, Ethernet device

3.2.1.1 Asynchronous Controllers 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. Refer to your terminal or printer manual for complete set-up instructions. Generally, the default settings for your terminal are acceptable.

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- and VT400-series terminals:

For VT300- and VT400-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 Enter key 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 Enter key 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 Comm Port option.
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.

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

3.2.1.2 Asynchronous Controllers 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:

1. Make sure each modem is connected to the system.
2. Make sure the modem is properly installed and connected to a phone jack.
3. 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:

1. Make sure the modem is properly installed and connected to a phone jack.
2. Set controls on the modem according to instructions in the modem user's guide.
3. 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 phone 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 for your VAX 4000 system:

- DIV32—DEC Integrated Services Digital Network (ISDN) controller
- 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: *VAX 4000 systems contain an Ethernet controller embedded in the CPU module. You can have a second optional Ethernet controller, the DESQA module, included with your system.*

Before using a network controller you must do the following:

1. Make sure the Ethernet cable (either standard transceiver cable or ThinWire cable) is connected to the CPU cover panel (or optional DESQA module). The light next to the connector should be lit, indicating an active connection. If not lit, move the Ethernet Connector switch to the proper position.
2. 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 or H4005 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 single port repeater (DESPR), which can be connected to a larger Ethernet or can serve to connect many systems in a local area network
 - To an available connection on a T-connector of other ThinWire nodes
3. Have the DECnet application installed on your system.
 4. Register your node with the network manager so that your node is recognized by other systems in the network.

Some software products, for example, Ethernet-based VAXcluster systems, use the Ethernet hardware address of other systems to operate properly.

To find the hardware address of your Ethernet device, use the command **SHOW ETHERNET** from console mode. The hardware address of your Ethernet device displays on the terminal as shown in the following example:

```
>>>SHOW ETHERNET
```

```
EZA0 (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

The following real-time options are available for your VAX 4000 system:

- **DRQ3B**—High-speed interface with two 16-bit data channels
- **DRV1W**—General purpose interface with one 16-bit input port, one 16-bit output port
- **AAV11-S**—Digital-to-analog converter with DMA capability
- **ADQ32**—Analog-to-digital converter with DMA capability
- **ADV11-S**—Analog-to-digital converter with DMA capability
- **AXV11**—Input/output circuit board for analog devices; analog-to-digital input, digital-to-analog output
- **IBQ01**—DMA controller that connects a Q-bus to RS-485 control
- **IEQ11**—DMA controller that connects a Q-bus to two independent busses
- **KWV11-S**—Programmable clock that counts events or time intervals, offers up to five frequencies

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 VAX 4000 systems have several printer options available. Consult the *VAX 4000 Model 200 Technical Information* for a list of printers and printer interface requirements.

3.5 Adding Options

If you have available Q-bus slots, you may be able to add modules to your system. Possible limitations to adding 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 modules. Contact your Digital service representative for assistance.*

[illegible][illegible]

Appendix A

Related Documentation

Document	Order Number
Hardware Documentation	
KA660 CPU System Maintenance	EK-418AA-MG
KA660 CPU Module Technical Manual	EK-KA660-TM
TSV05 Tape Transport System User's Guide	EK-TSV05-UG
RRD40 Disc Drive Owner's Guide	EK-RRD40-OM
RF30/RF71 User Guide	EK-RF71D-UG
Software Documentation	
Overview of VMS Documentation	AA-LA95A-TE
VMS VAXcluster Manual	AA-LA27A-TE
VMS Networking Manual	AA-LA48A-TE
Guide to DECnet-VAX Networking	AA-LA47A-TE
VMS Version 5.4 Upgrade and Installation Manual	AA-NGGIC-TE
VMS Installation and Operations	AA-I B35B-TE
VAXELN Host System Guide	AA-JG87B-TE
VAXELN Run-Time Facilities Guide	AA-JM81B-TE
Microcomputer Handbook Series	
VAX Architecture Handbook	EB-19580-20
VAX Software Handbook	EB-21812-20

Documentation specific to supported options is listed with the option in *VAX 4000 Model 200 Technical Information*.

Appendix B

Programming Parameters for RF-Series ISEs

This appendix describes the procedures for setting and examining parameters for RF-series ISEs.

NOTE: *Before you reprogram ISEs, you should have a good understanding of DSSI architecture and VAXcluster software operation. If you do not have that understanding, you should read the VMS manuals listed in Appendix A or call your Digital service representative.*

Two types of DSSI storage adapters are available for VAX 4000 systems: an embedded DSSI host adapter that is part of the KA660 CPU and the KFQSA storage adapter.

Each storage adapter provides a separate DSSI bus that can support up to seven RF-series ISEs (six ISEs for a dual-host configuration). The adapters make a connection between the CPU and the requested ISE on their respective DSSI bus. Each ISE has its own controller and server that contain the intelligence and logic necessary to control data transfers over the DSSI bus.

B.1 RF-Series ISE Parameters

Six principal parameters are associated with each RF-series ISE:

- Bus Node ID
- ALLCLASS
- UNITNUM
- FORCEUNI
- NODENAME
- SYSTEMID

NOTE: Each of the above ISE parameters, with the exception of the Bus Node ID, are programmed and examined using the console-based Diagnostic and Utility Protocol (DUP) driver utility. The ISE Bus Node ID is physically determined by the numbered Bus Node ID plug that inserts into the Operator Control Panel (OCP).

A brief description of each parameter follows:

The Bus Node ID parameter is provided by the bus node ID plug on the OCP. Each DSSI bus can support up to seven ISEs, bus nodes 0 through 6 (0 through 5 for dual-host systems). Refer to your *Operation* manual for instructions on changing bus node ID plugs.

The ALLCLASS parameter determines the device allocation class. The allocation class is a numeric value from 0 to 255 that is used by the VMS operating system to derive a path-independent name for multiple access paths to the same ISE. RF-series ISEs are shipped from the factory with a default allocation class of zero. Each RF-series ISE to be served to the cluster should have an allocation class that matches the allocation class of the host system. Refer to the *VMS VAXcluster* manual for rules for specifying allocation class values.

The UNITNUM parameter determines the unit number of the ISE. By default, the ISE unit number is supplied by the Bus Node ID plug on the OCP. Certain multiple bus configurations, described later on in this section, require that the default values be replaced with unique ISE unit numbers. To set unit numbers and override the default values, you use the console-based DUP driver utility to supply values to the UNITNUM parameter and to set a value of zero to ISE parameter FORCEUNI.

The FORCEUNI parameter controls the use of UNITNUM to override the default ISE unit number supplied by the Bus Node ID plug. When FORCEUNI is set to a value of zero, the operating system uses the value assigned to the UNITNUM parameter; when FORCEUNI is set to a value of one, the operating system uses the value supplied by the Bus Node ID plug.

The NODENAME parameter allows each ISE to have an alphanumeric node name of up to eight characters. RF-series ISEs are shipped from the factory with a unique identifier, such as R7CZZC, R7ALUC, and so on. You can provide a node name of your choosing if you prefer.

The SYSTEMID parameter provides a number that uniquely identifies the ISE to the operating system. This parameter is modified only when replacing an ISE. Only Customer Services representatives and qualified self-maintenance customers can remove an ISE.

The following describes how the operating system uses the ISE parameters to form unique identifiers for each ISE. Configurations that require you to assign new unit numbers for ISEs are also described.

With an allocation class of zero, the operating system can use the default parameter values to provide each ISE with a unique device name. The operating system uses the node name along with the device logical name in the following manner:

NODENAME\$DIA μ

where:

NODENAME is a unique node name and μ is the unit number.

With a nonzero allocation class, the operating system relies on unit number values to create a unique device name. The operating system uses the allocation class along with the device logical name in the following manner:

\$ALLCLASS\$DIA μ

where:

ALLCLASS is the allocation class for the system and ISEs, and μ is a unique unit number.

Using the KFQSA storage adapter and mass storage expanders, you can fill multiple DSSI busses. Each bus can have seven ISEs (bus nodes 0–6). When a second bus is added to the system, and your system is using a nonzero allocation class, you need to assign new unit numbers for ISEs on one of the busses, as the unit numbers for ISEs throughout the system must be unique. Table B–1 illustrates the need to program unit numbers for a system using both more than one DSSI bus and a nonzero allocation class. In the case of the nonzero allocation class, the operating system sees the ISEs as having duplicate device names.

Table B-1: How the VMS Operating System Identifies the ISEs

Allocation Class=0	Nonzero Allocation Class (Example: ALLCLASS=1)
R7CZZC\$DIA0	\$1\$DIA0*
R7ALUC\$DIA1	\$1\$DIA1*
R7EB3C\$DIA2	\$1\$DIA2*
R7IDFC\$DIA0	\$1\$DIA0*
R7IBZC\$DIA1	\$1\$DIA1*
R7IKJC\$DIA2	\$1\$DIA2*
R7ID3C\$DIA3	\$1\$DIA3
R7XA4C\$DIA4	\$1\$DIA4
R7QIYC\$DIA5	\$1\$DIA5
R7DA4C\$DIA6	\$1\$DIA6

*Nonzero allocation class examples with an asterisk indicate duplicate device names. For one of the DSSI busses, the unit numbers need to be reprogrammed to avoid this error.

The following instructions describe how to change ISE parameters using the DUP driver utility. In the sample procedures, the allocation class will be set to 2, the ISEs will be assigned new unit numbers, and the system disk will be assigned a new node name.

1. Enter the console mode.

The procedure for programming internal parameters for RF-series ISEs requires that you issue commands to those RF-series ISEs at the console prompt (>>>). You may enter these commands in either uppercase or lowercase letters. Unless otherwise instructed, enter each command, then press Return.

Enter console mode as follows:

- a. Set the Break Enable/Disable switch on the CPU cover panel to the enable position (up, dot inside the circle).
- b. Set the power switch for each unit (both hosts for a dual-host system, and any expanders for expanded systems) to on (1).

Wait for the system to display the console prompt (>>>).

2. Make sure the ISEs for which you want to set parameters are on line and are not write protected. The Run/Ready button should be in (lit), and the Write-Protect button should be out (not lit).
3. For systems with embedded DSSI, enter `SHOW DSSI` at the console prompt for a display of all DSSI devices in your expanded system. For KFQSA-based DSSI, enter `SHOW UQSSP`.

The firmware displays two lines of information for each ISE. The first line contains the node number and node name. The second line contains the device name and unit number followed by the device type in parentheses.

For embedded DSSI, the device name consists of the letters `DIA $n$` and the DSSI host adapter is identified by an asterisk (*). For KFQSA-based DSSI, the device name consists of the letters `DU $c$  $n$` , where c is the controller letter, and n is a unique unit number.

The following examples show a system with two RF31 ISEs. Example B-1 shows a system with embedded DSSI and Example B-2 shows a system with KFQSA-based DSSI.

Example B-1: SHOW DSSI Display (Embedded DSSI)

```
>>>SHOW DSSI
DSSI Node 0 (R7CZZC)
-DIA0 (RF31)
DSSI Node 1 (R7ALUC)
-DIA1 (RF31)
DSSI Node 7 (*)
>>>
```

Example B-2: SHOW UQSSP Display (KFQSA-Based DSSI)

```
>>>SHOW UQSSP
UQSSP Disk Controller 0 (772150)
-DUA0 (RF31)
UQSSP Disk Controller 1 (760334)
-DUB1 (RF31)
UQSSP Tape Controller 0 (774500)
-MUA0 (TK70)
```

In this example, each ISE will be assigned an allocation class of 2, and the system disk will be given a new node name. Also, ISEs DIA0, DIA1, and DIA2 (or DUA0, DUB1, and DUC2) will be assigned unit numbers 10, 11, and 12, respectively.

B.2 Entering the DUP Driver Utility

To examine and change internal RF-series ISE parameters, you must first activate the DUP driver utility by setting host to the specific ISE for which you want to modify or examine parameters.

Use the following command for embedded DSSI:

```
SET HOST/DUP/DSSI <node_number> PARAMS
```

where:

<node_number> is the bus node ID (0-6) for the ISE on the bus.

Use the following command for KFQSA-based DSSI:

```
SET HOST/DUP/UQSSP/DISK <node_number> PARAMS
```

where:

<node_number> is the bus node ID (0-6) for the ISE on the bus.

The following examples show the commands entered at the console prompt to start the DUP server for the ISE at node 0. In Example B-3, you enter SET HOST/DUP/DSSI 0 PARAMS for embedded DSSI. In Example B-4, you enter SET HOST/DUP/UQSSP/DISK 0 PARAMS for KFQSA-based DSSI.

Example B-3: Starting the DUP Driver Utility (Embedded DSSI)

```
>>>SET HOST/DUP/DSSI 0 PARAMS
Starting DUP server...
Copyright (c) 1990 Digital Equipment Corporation
PARAMS>
```

Example B-4: Starting the DUP Driver Utility (KFQSA-Based DSSI)

```
>>>SET HOST/DUP/UQSSP/DISK 0 PARAMS
Starting DUP server...
Copyright (c) 1990 Digital Equipment Corporation
PARAMS>
```

B.3 Setting Allocation Class

After entering the DUP driver utility for a specified ISE, you can examine and set the allocation class for the ISE as follows:

1. At the PARAMS> prompt, enter SHOW ALLCLASS to check the allocation class of the ISE to which you are currently connected.
2. Enter SET ALLCLASS 2 (or enter the allocation class you desire).
3. Enter SHOW ALLCLASS to verify the new allocation class.

Example B-5 shows the steps for examining and changing the allocation class for a specified ISE. In the example, the allocation class is changed from an allocation class of 0 to an allocation class of 2.

Example B-5: Setting Allocation Class for a Specified ISE

PARAMS>SHOW ALLCLASS

Parameter	Current	Default	Type	Radix	
ALLCLASS	0	0	Byte	Dec	B

PARAMS>SET ALLCLASS 2

PARAMS>SHOW ALLCLASS

Parameter	Current	Default	Type	Radix	
ALLCLASS	2	0	Byte	Dec	B

B.4 Setting Unit Number

After entering the DUP driver utility for a specified ISE, you can examine and set the unit number for the ISE as follows:

1. At the PARAMS> prompt, enter SHOW UNITNUM to check the unit number of the ISE to which you are currently connected.
2. Enter SET UNITNUM 10 (or enter the unit number you desire).
3. Enter SET FORCEUNI 0 to override the default unit number value supplied by the bus node ID plug.
4. Enter SHOW UNITNUM to verify the new unit number.
5. Enter SHOW FORCEUNI to verify that the current value for the FORCEUNI parameter is 0.

Example B-6 shows the steps for changing the unit number of a specified ISE from unit number 0 to unit number 10.

Example B-6: Setting a Unit Number for a Specified ISE

PARAMS>SHOW UNITNUM

Parameter	Current	Default	Type	Radix	
UNITNUM	0	0	Word	Dec	U

PARAMS>SET UNITNUM 10

PARAMS>SET FORCEUNI 0

PARAMS>SHOW UNITNUM

Parameter	Current	Default	Type	Radix	
UNITNUM	10	0	Word	Dec	U

PARAMS>SHOW FORCEUNI

Parameter	Current	Default	Type	Radix	
FORCEUNI	0	1	Boolean	0/1	U

B.5 Setting Node Name

After entering the DUP driver utility for a specified ISE, you can examine and set the node name for the ISE as follows:

1. At the PARAMS> prompt, enter SHOW NODENAME to check the node name of the ISE to which you are currently connected.
2. Enter SET NODENAME SYSDSK (or enter the desired alphanumeric node name of up to eight characters).
3. Enter SHOW NODENAME to verify the new node name.

Example B-7 shows the steps for changing the node name of a specified ISE from the factory-supplied name to SYSDSK.

Example B-7: Changing a Node Name for a Specified ISE

PARAMS>SHOW NODENAME

Parameter	Current	Default	Type	Radix
NODENAME	R7CZ2C	RF31	String	Ascii B

PARAMS>SET NODENAME SYSDSK

PARAMS>SHOW NODENAME

Parameter	Current	Default	Type	Radix
NODENAME	SYSDSK	RF31	String	Ascii B

B.6 Setting System ID

NOTE: This parameter is modified only when replacing an ISE. Only Customer Services representatives and qualified self-maintenance customers should remove an ISE. All parameters for the replacement ISE should be programmed to match those of the original ISE.

After entering the DUP driver utility for a specified ISE, you can examine and set the system ID for the ISE as follows:

1. At the PARAMS> prompt, enter SHOW SYSTEMID to check the system ID of the ISE to which you are currently connected.
2. Enter SET SYSTEMID *System ID* (enter the desired serial number-based system ID).
3. Enter SHOW SYSTEMID to verify the new system ID.

Example B-8 shows the steps for changing the system ID of a specified ISE from the factory-supplied system ID to 1402193310841 (the system ID for the replacement ISE is programmed to match that of the original ISE).

Example B-8: Changing a System ID for a Specified ISE

PARAMS>SHOW SYSTEMID

Parameter	Current	Default	Type	Radix	
SYSTEMID	0402193310841	00000000000000	Quadword	Hex	B

PARAMS>SET SYSTEMID 1402193310841

PARAMS>SHOW SYSTEMID

Parameter	Current	Default	Type	Radix	
SYSTEMID	1402193310841	00000000000000	Quadword	Hex	B

B.7 Exiting the DUP Server Utility

After you have completed setting and examining internal ISE parameters, enter the **WRITE** command at the **PARAMS>** prompt to save the ISE parameters you have changed using the **SET** command. The changes are recorded to nonvolatile memory.

If you have changed the allocation class or node name of an ISE, the DUP driver utility will ask you to initialize the controller. Answer Yes (Y) to allow the changes to be recorded and to exit the DUP driver utility.

If you have not changed the allocation class or node name, enter the **EXIT** command at the **PARAMS>** prompt to exit the DUP driver utility for the specified ISE. Example B-9 shows the procedure for saving parameter changes. In the example, the controller is initialized.

Example B-9: Exiting the DUP Driver Utility for a Specified ISE

```
PARAMS>WRITE
Changes require controller initialization, ok? [Y/(N)] Y
Stopping DUP server...
>>>
```

NOTE: *You must repeat the procedures in this chapter for each ISE for which you want to change parameters.*

Example B-10 shows the display for the SHOW DSSI command for a system with embedded DSSI after the unit numbers for the ISEs have been changed from 0 and 1, to 10 and 11. Notice that the bus 0 device names are now DIA10 and DIA11.

Example B-10: SHOW DSSI Display

```
>>>SHOW DSSI
DSSI Node 0 (SYSDSK)
-DIA10 (RF31)
DSSI Node 1 (R7ALUC)
-DIA11 (RF31)
DSSI Bus 0 Node 7 (*)
>>>
```

Example B-11 shows the display for the SHOW UQSSP command for a system with KFQSA-based DSSI.

Example B-11: SHOW UQSSP Display (KFQSA-Based DSSI)

```
>>>SHOW UQSSP
UQSSP Disk Controller 0 (772150)
-DUA0 (RF31)
UQSSP Disk Controller 1 (760334)
-DUB1 (RF31)
UQSSP Tape Controller 0 (774500)
-MUA0 (TK70)
```


Appendix C

Backup Procedures

This appendix describes the following procedures:

- Installing and booting standalone BACKUP on the system disk
- Installing and booting standalone BACKUP on a TK50 tape cartridge
- Backing up and restoring the system disk

C.1 Overview of Standalone BACKUP

The Backup utility lets you create and restore backup copies of files, directories, and user disks. Because the Backup Utility copies only what is on the disk and ignores sections of any open files contained in memory, you should use it to back up user disks, not the system disk. If you use the Backup Utility to back up the system disk, the portions of the files that were in memory and data about files not yet written back to the disk (cache) will not be recorded on the resulting backup copy.

Use standalone BACKUP to make a complete backup of the system disk. Standalone BACKUP is a version of the Backup Utility that runs without the support of the entire VMS operating system. Before you use standalone BACKUP, you must shut down the VMS operating system. The shutdown procedure sends the contents of the caches back to the disk and closes any open files. By shutting down the system and using standalone BACKUP, you can make an exact copy of the system disk.

You can keep standalone BACKUP on the system disk, a TK50 tape cartridge, or any other media the system supports. Digital recommends that you keep standalone BACKUP on the system disk and on a tape cartridge.

Usually you boot standalone BACKUP from the system disk because it saves time. You should, however, keep a copy of standalone BACKUP on a tape cartridge in case the system disk becomes damaged.

C.1.1 Installing Standalone BACKUP on the System Disk

You can install standalone BACKUP in any available root directory on the system disk from [SYS1] to [SYSE]. However, Digital has established [SYSE] as the standard directory for standalone BACKUP.

To install standalone BACKUP in [SYSE] on the system disk, use the following procedure:

1. Log in to the SYSTEM account.
2. Enter the following command:

```
$ @SYSSUPDATE:STABACKIT SYSS$SYSDEVICE: 
```

The procedure places the files in the directories [SYSE.SYSEXE] and [SYSE.SYS\$LDR] on the system disk. It lists the files as they are copied. When the procedure finishes, the system displays the following message:

The kit is complete.

3. To boot standalone BACKUP from the system disk, see Section C.1.2.

C.1.2 Booting Standalone BACKUP from the System Disk

To boot standalone BACKUP from the system disk, use the following procedure:

1. If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, enter the following command to shut down the system:

```
$ @SYSS$SYSTEM:SHUTDOWN 
```

Answer the questions. When the procedure asks if an automatic system reboot should be performed, press Return for No. When the procedure is finished, the system displays the following message:

SYSTEM SHUTDOWN COMPLETE - USE CONSOLE TO HALT SYSTEM

2. Stop the system by pressing the Halt button on the SCP.
3. Enter the BOOT command in the following format:

```
>>>B/E0000000 device_name 
```

Substitute the device name of the system disk for `device_name`. For example, if the system disk has a device name of DIA0, enter the following:

```
>>>B/E0000000 DIA0 
```

4. Standalone BACKUP displays a message similar to the following:

```
VAX/VMS Version V5.4-n Major version id = n Minor version id = n
```

5. A few minutes later the procedure asks for the date and the time. Enter the date and time, using the 24-hour clock format; for example:

```
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)  
19-APR-1990 13:00 
```

6. The system displays a list of the local devices on your system; for example:

```
Available device MUA0:      device type TK70  
Available device DIA0:      device type RF31  
.  
.  
.
```

Check the list of devices. If the list is incomplete, make sure that all the devices are connected properly to the system. See the *VAX 4000 Model 300 Installation* manual for details.

7. When standalone BACKUP finishes booting, it displays an identification message followed by the dollar-sign prompt (\$):

```
*BACKUP-I-IDENT, stand-alone BACKUP V5.4-n; the date is  
19-APR-1990 13:00:00.00  
$
```

To back up the system disk, see Section C.2.

To restore the system disk, see Section C.3.

C.1.3 Installing Standalone BACKUP on a Tape Cartridge

If your system has a tape drive, Digital recommends that you keep standalone BACKUP on a tape cartridge in case the system disk becomes damaged. To install standalone BACKUP on a tape cartridge, use the following procedure.

NOTE: *If you have a tape cartridge distribution kit, you already have standalone BACKUP on a tape cartridge. If the original tape cartridge becomes damaged or if you need to make extra copies, use the procedure in this section.*

1. Obtain a blank tape cartridge. Write the name on the paper label. For example, you would use the name S/A BKUP V5.4-n TK50 to build a Version 5.4-n kit. Insert the label into the label slot.
2. Write-enable the tape cartridge.
3. Insert the tape cartridge labeled S/A BKUP V5.4-n TK50 in the tape cartridge drive.
4. Log in to the SYSTEM account.
5. Enter the following command:

```
$ @SYSSUPDATE:STABACKIT 
```

6. The system asks for the name of the target device. Enter MUA0, for example:

```
%STABACKIT-I-SYMDL, all global symbols deleted
Enter the name of the device on which to build the kit:
MUA0 
```

NOTE: *If your system uses the TLZ04 tape drive, enter the device name MKA0.*

7. The system displays the following message:

```
.
.
.
Please place the scratch tape cartridge in drive _MUA0:
This volume will receive the volume label SYSTEM.
Enter "YES" when ready:
```

8. When you are ready to continue, enter Y (for Yes) and press Return.
9. The system displays verification messages informing you that files are being copied.
10. When standalone BACKUP is installed, the system displays a message similar to the following:


```
Ending time 19-APR-1990 13:45:29.90
Starting time 19-APR-1990 13:22:39.05
The kit is complete.
$
```
11. Remove the tape cartridge labeled S/A BKUP V5.4-n TK50 from the tape cartridge drive.
12. Write-protect the tape cartridge and store it in a safe place.

C.1.4 Booting Standalone BACKUP from a Tape Cartridge

If the system disk containing standalone BACKUP should become unusable, you can boot standalone BACKUP from a tape cartridge. Booting standalone BACKUP from a tape cartridge takes approximately 20 minutes. You need a tape cartridge that contains standalone BACKUP (either the distribution tape cartridge or one that you created). To boot standalone BACKUP from a tape cartridge, use the following procedure:

1. If the VMS operating system is not running, go to step 2.

If the VMS operating system is running, enter the following command to shut down the operating system:

```
$ @SYS$SYSTEM: SHUTDOWN 
```

Answer the questions. When the procedure asks if an automatic system reboot should be performed, press Return for No. When the procedure is finished, the system displays the following message:

```
SYSTEM SHUTDOWN COMPLETE - USE CONSOLE TO HALT SYSTEM
```

2. Stop the system by pressing the Halt button on the SCP.
3. Insert the tape cartridge containing standalone BACKUP in the tape cartridge drive.
4. To boot standalone BACKUP, enter the following command at the console prompt (>>>):

```
>>>B MUA0 
```

5. Standalone BACKUP displays a message similar to the following:

```
VAX/VMS Version V5.4--n Major version id=1 Minor version id=0
```

6. The procedure asks for the date and the time. Enter the date and time, using the 24-hour clock format; for example:

```
PLEASE ENTER DATE AND TIME (DD-MMM-YYYY HH:MM)
```

```
19-APR-1990 13:00 
```

7. The system displays a list of the local devices on your system; for example:

```
Available device MUA0:      device type TK70
Available device DIA0:      device type RF31
```

```
.
```

8. When standalone BACKUP finishes booting, it displays an identification message followed by the dollar-sign prompt (\$):

```
*BACKUP- IDENT, stand-alone BACKUP V5.4--n; the date is
19-APR 1990 13:00:00.00
$
```

9. Remove the tape cartridge containing standalone BACKUP from the tape cartridge drive.

To back up the system disk, see Section C.2.

To restore the system disk, see Section C.3.

C.2 Backing Up the System Disk

The reasons to back up a system disk are:

- In case a problem occurs during a VMS upgrade or update, or during the installation of other software products: *Before* you attempt any of these procedures, you should back up the system disk. If a problem occurs, you can restore the backup copy of the system disk.
- To prevent loss of system files if they are deleted accidentally: *After* you install or upgrade the VMS operating system or any other software products, you should back up the system disk. If a system file is deleted and renders the system disk inoperable, you can restore the backup copy and continue to use the system.
- In case the system disk malfunctions: If you have a backup copy of the VMS operating system, you can restore it to a functioning disk and continue to use the system.
- To eliminate disk fragmentation: Fragmentation happens when files are not stored contiguously on the disk. Back up the system disk to a tape cartridge, diskettes, or another disk. Then restore the files to the original system disk. The BACKUP command creates a copy on which files are stored contiguously.

Digital recommends that you use standalone BACKUP, which uses a subset of Backup utility qualifiers, to back up and restore the system disk. It is especially important that you understand the functions of the /IMAGE and /PHYSICAL qualifiers to the BACKUP command before using standalone BACKUP. Table C-1 summarizes the standalone BACKUP qualifiers.

Table C-1: Standalone BACKUP Qualifiers

Qualifier	Function
/IMAGE	Allows you to create a functionally equivalent copy of the entire system disk
/PHYSICAL	Copies, saves, restores, or compares the entire system disk in terms of logical blocks, ignoring any file structure

For a complete description of the Backup utility and its qualifiers, see the *VMS Backup Utility Manual*.

To back up the system disk, use the following procedure:

1. Decide whether you want to back up the system to another fixed disk or to a tape cartridge. If you are using a tape cartridge, obtain a scratch tape that you can use for the backup copy. A scratch tape cartridge is a tape cartridge that is either blank or contains files that you no longer need.
2. If you are using a tape cartridge, write-enable it. To write-enable a tape cartridge, slide the write-protect switch away from the tape cartridge label. Insert the tape cartridge in the tape cartridge drive.
3. Determine the device name of the drive holding the system disk and the drive holding the backup disk or tape cartridge. Enter the SHOW DEVICE command at the console prompt (>>>).
4. Boot standalone BACKUP as described in Section C.1.2 or Section C.1.4.
5. Enter the BACKUP command in one of the following formats:

```
$ BACKUP/IMAGE/VERIFY source_drive: target_drive: 
```

```
$ BACKUP/IMAGE/VERIFY source_drive: target_drive:-   
-$ saveset.BCK/LABEL=volume_label/REWIND 
```

where:

- `source_drive` is the location of the files that you want to back up. Use the device name of the drive holding the system disk.
- `target_drive` is the destination. Use the device name of the drive holding the backup disk or tape cartridge.
- `saveset.BCK` is the name of the saveset (the name should reflect the contents of the backup tape and cannot exceed 17 characters in length).

- `volume_label` is the volume label of the tape cartridge in the tape drive. If the tape has been initialized already, use the same volume label that was assigned by the INITIALIZE command. If the tape has not been initialized, you can assign a volume label at this time. The volume label cannot have more than six characters.

The following example uses the BACKUP command to make a backup disk. You can use a backup disk as the system disk:

```
$ BACKUP/IMAGE/VERIFY DIA0: DIA1 
```

The following example uses the BACKUP command to make a backup tape cartridge. The contents of the backup tape cartridge must be restored to a disk before you can use them. For more information, see Section C.3.

```
$ BACKUP/IMAGE/VERIFY DIA0: MUA0:~ 
-$ APR_19_1990.BCK/LABEL=19APRF/REWIND 
```

6. The system displays the following message:

```
%BACKUP-I-STARTVERIFY, starting verification pass
```

7. If you are backing up the system disk to another disk, proceed to step 8.

If you are backing up your system disk to a tape cartridge and the contents of the system disk fit on one tape cartridge, remove the backup tape cartridge from the drive. Label the tape COMPLETE SYSTEM BACKUP, number it, and include the date. Proceed to step 8.

If you are backing up your system disk to a tape cartridge and the system disk contains more data than one tape cartridge can store, the system displays the following messages:

```
%BACKUP-I-RESUME, Resuming operation on volume 2
%BACKUP-I-READYWRITE, Mount volume 2 on _MUA0: for writing
Enter "YES" when ready:
```

Do the following:

- a. Remove the backup tape cartridge from the drive.
- b. Label the tape COMPLETE SYSTEM BACKUP, number it, and include the date.
- c. Write-protect the tape cartridge.
- d. Write-enable another scratch tape cartridge and insert it in the drive.

- e. When you are ready to continue, enter Y (for Yes) and press Return. The procedure displays the following message:

*BACKUP-I-STARTVERIFY, starting verification pass

Each time the procedure displays a mount request, follow steps a through e.

8. When the procedure is finished, the system displays the following message:

*BACKUP-I-PROCDONE, operation completed. Processing finished at
19-APR-1990 15:00:00.00

If you do not want to perform another standalone BACKUP operation, use the console to halt the system.

If you do not want to perform another standalone BACKUP operation, ensure the standalone application volume is online and ready. Enter "YES" to continue:

9. Press the Halt button.

10. Reboot the system.

Store the backup tape cartridge in a safe place.

NOTE: The *BACKUP* command creates a system disk that includes a Digital-provided set of volume parameters, including a *CLUSTER_SIZE* (disk access scheme) of value 1. (The *CLUSTER_SIZE* parameter refers to the way files are stored on the disk, NOT to VAXcluster environments.) You can change most volume parameters later with the *SET VOLUME* command. However, to change the *CLUSTER_SIZE* parameter, you must back up the system disk that has been initialized previously with the *CLUSTER_SIZE* value that you want. To prevent the *BACKUP* command from reinitializing the target disk, use the */NOINITIALIZE* qualifier. For more information about initializing a disk, see the *Guide to Maintaining a VMS System*. For more information on the *BACKUP* command, see the *VMS Backup Utility Manual*.

C.3 Restoring the System Disk

To restore the system disk from a tape cartridge, use the following procedure:

1. Determine the device names of the drive holding the system disk and the drive holding the backup disk or tape cartridge. Enter the *SHOW DEVICE* command at the console prompt (>>>).

2. Boot standalone BACKUP as described in Section C.1.2 or Section C.1.4.
3. If you have a backup tape cartridge, make sure it is write protected. Insert it in the drive.
4. Enter the BACKUP command in one of the following formats:

```
$ BACKUP/IMAGE/VERIFY source_drive: target_drive: 
```

```
$ BACKUP/IMAGE/VERIFY source_drive:- 
```

```
-$ saveset.BCK/SAV/REWIND target_drive: 
```

where:

- source_drive is the location of the files that you want to restore. Use the device name of the drive holding the backup disk or tape cartridge.
- target_drive is the destination. Use the device name of the drive holding the system disk.
- saveset.BCK is the name of the saveset, if you have a backup tape cartridge.

For example:

```
$ BACKUP/IMAGE/VERIFY DIA0: DIA1: 
```

The following example uses the BACKUP command to restore the system disk from a backup tape cartridge:

```
$ BACKUP/IMAGE/VERIFY- 
```

```
-$ MUA0:APR_19_1990.BCK/SAV/REWIND DIA0: 
```

5. The system displays the following message:

```
*BACKUP-I-STARTVERIFY, starting verification pass
```

If you are backing up to a disk or if your saveset fits on one tape, proceed to step 7.

6. If you have more than one backup tape cartridge, the system displays the following message:

```
*BACKUP-I-RESUME, Resuming operation on volume 2
```

```
*BACKUP-I-READYWRITE, Mount volume 2 on _MUA0: for reading
```

```
Enter "YES" when ready:
```

Remove the backup tape cartridge from the drive. Insert the next backup tape cartridge in the drive, enter Y (for Yes) and press Return. Each time you receive a mount request, repeat this step.

7. When the procedure is finished, the system displays the following message:

%BACKUP-I-PROCDONE, operation completed.

Processing finished at 19-APR-1990 15:00:00.00

If you do not want to perform another standalone BACKUP operation, use the console to halt the system.

If you do not want to perform another standalone BACKUP operation, ensure the standalone application volume is online and ready.

Enter "YES" to continue:

8. Press the Halt button.
9. Reboot the system.

Appendix D

Removing Unwanted VMS Files

D.1 Using VMSTAILOR

Read this appendix if you want to remove the VMS operating system and DECwindows files that you do not need from the system disk. For example, if you are not running DECnet-VAX, you do not need the network support files. You can remove unwanted files with the VMSTAILOR program. Enter the following command to log in to the SYSTEM account:

```
$ RUN SYS$UPDATE:VMSTAILOR 
```

The VMSTAILOR program asks you if you want to tailor files ON or OFF. Enter OFF to remove unwanted files.

CAUTION: *Do not delete files from the factory-installed software (FIS) system until you have backed up your software. A VMS distribution kit is needed to return files to the system disk. Also, VMSTAILOR and DECW\$TAILOR procedures cannot restore files from a backup set. It may be necessary to reload the system software from a backup set if files are incorrectly deleted and if a VMS distribution kit is not available.*

The VMSTAILOR program lists each group of files and its size in blocks. Files are grouped according to their function. For example, all the files required for cluster support are in one group. A file group is made up of many small subgroups. You can eliminate an entire group of files or you can eliminate one or more of its subgroups.

Decide which file groups or subgroups you do not need to support your system. The VMSTAILOR program displays step-by-step instructions that are easy to follow.

VMSTAILOR displays the names of the files it deletes. After it finishes, AUTOGEN runs automatically to make the adjustments that are necessary after system files are deleted.

NOTE: *You can use VMSTAILOR at any time to delete or add groups of VMS files to the system disk. After adding files to the system disk, you should apply any updates that affect them.*

For example, suppose you do not need the VMS Version 5.0 MAIL utility and you run VMSTAILOR to remove those files. Later on, if you decide you want to use mail, you can run VMSTAILOR to return the MAIL files to the system disk. You then apply any VMS upgrade or update that has occurred since Version 5.0 that affected the MAIL utility. To remove VMS DECwindows files from the system disk, enter the following command:

```
$ RUN SYS$UPDATE:DECW$TAILOR 
```

The DECW\$TAILOR program works just like the VMSTAILOR program.

Glossary

Allocation class

The allocation class is used by the VMS operating system to derive a common lock resource name for multiple access paths to the same device.

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.

Backup

The process of making copies of the data stored in the ISE(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 the ISE that is stored on a tape cartridge.

Baud rate

The speed at which signals are transmitted serially over a communication line.

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.

Boot node

The management center for the cluster and its major resource provider.

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

The connection between the central processing unit (CPU) and input/output devices in the system. Information signals such as address, data, and control signals are carried through the bus.

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.

Cluster

A group of computers networked together that share disk storage, application programs, and other computer resources. Also called a VAXcluster.

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*.

DAT

Digital audio tape. Used in digital data storage recording technology.

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.

DDS

Digital data storage.

Debug

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

DECnet

Digital networking software that runs on nodes in both local and wide area networks.

DECwindows

Digital's workstation management product, a superset of the industry standard X Window System. It can be used to run windowing applications efficiently on single workstations, or in distributed processing networks of workstations and non-workstations systems.

Default

A value or setting that in most cases is normal or expected.

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.

DSSI

Digital Storage Systems Interconnect (DSSI) is the technology used for efficient management of integrated disk storage products. DSSI is a member of the Digital Storage Architecture (DSA) product family.

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). In a VAX 4000 system, the power-up 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 fixed-disk drive, 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.

Integrated Storage Element (ISE)

Integrated Storage Elements (ISEs) are intelligent storage devices that contain their own controller and MSCP server.

Interactive

The method of communicating with a computer system. You enter 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.

ISE

See *Integrated Storage Element*.

Kbyte

1024 bytes.

LED

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

Load

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

Network

A group of individual computer systems that are connected by communications lines to share information and resources.

Network coordinator

The network coordinator manages the network, assigns unique node names and addresses for each system on the network, and provides administrative assistance to network users.

Node

An individual information processing unit, such as a computer, workstation, or device, that is connected to a network. A node is an end point to any branch of a network or a junction common to two or more branches.

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-up 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.

Product Authorization Key (PAK)

A PAK is a printed certificate containing information that must be input to the VMS License Management Facility to authorize the VMS user to run a particular software product.

Program

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

Prompt

A character(s) or word(s) that a computer displays to indicate it is waiting for you to type a command.

Quorum disk

A quorum disk acts as a virtual node in a system using the quorum scheme. See the *VMS VAXcluster Manual* for further information on quorum disks and the quorum scheme.

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.

Satellite system

A system that is booted remotely from the system disk on the boot node. A computer system that obtains a specific set of services from a server system.

Server

Hardware or software that provides a specific set of services to a satellite.

Server system

In a VAXcluster, a computer that is used to start the satellite systems and to manage their use of common resources.

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 disk

The disk or ISE that holds VMS factory-installed software.

System management

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

Tailoring

Using the VMSTAILOR program to remove the VMS operating system and DECwindows files that you do not need from the system disk.

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).

VMS

Digital's proprietary operating system.

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.

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