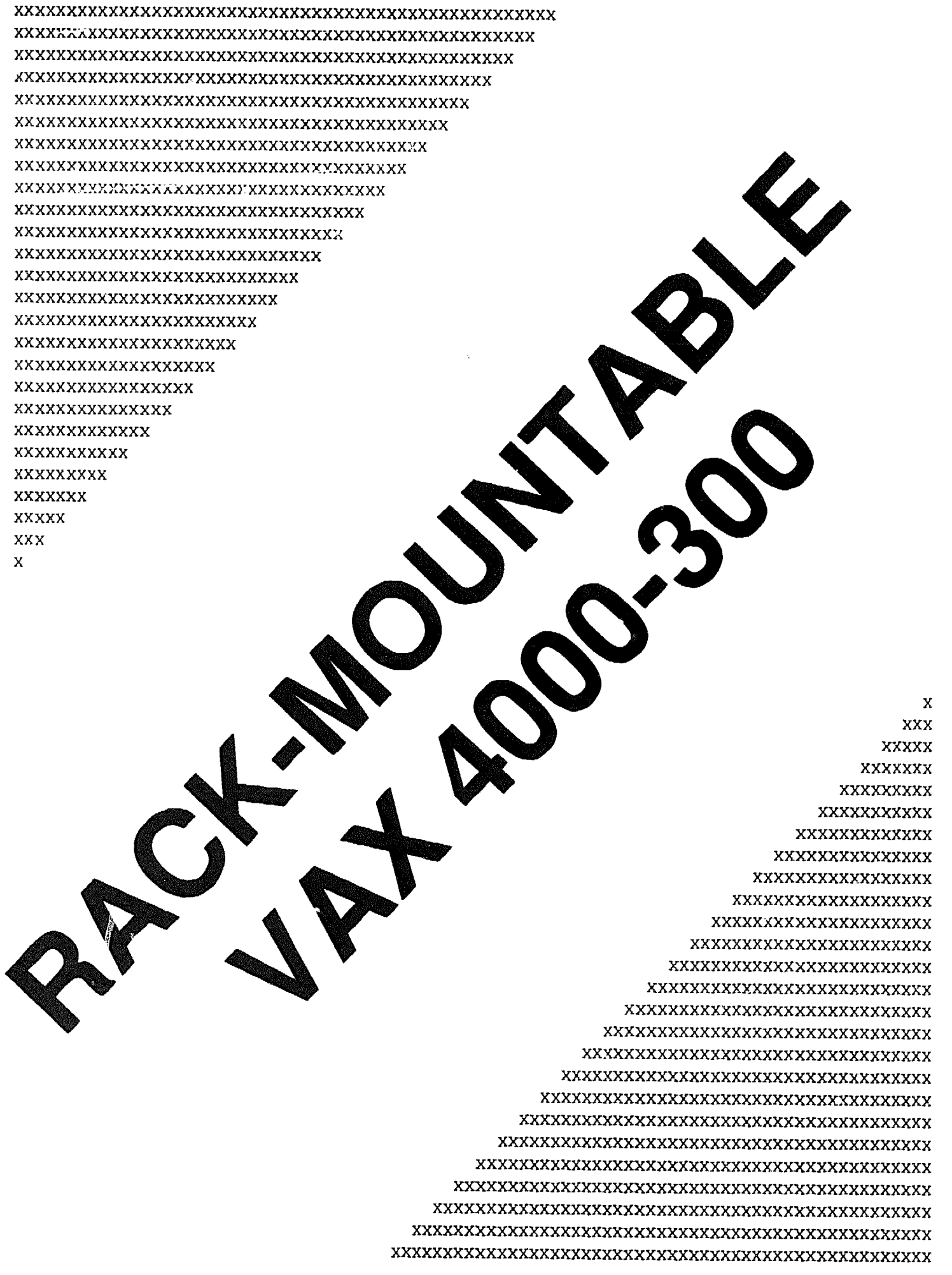
RACK-MOUNTABLE
VAX 4000-300

Rack–mountable VAX 4000 Model 300

Installation/Owner's Manual

Order Number: EK–BA441–IN–003

Prepared by
U.S. Area EIC Documentation Services

Digital Equipment Corporation • Merrimack, NH 03054

May 1991

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Preface

This manual provides information to Digital Customer Service personnel and customer maintenance personnel on how to install the Rack-mountable VAX 4000 Model 300 Computer System.

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

The audience for this book is the customer who is familiar with computer hardware, familiar with operating systems, and experienced and trained in using installation manuals.

ORGANIZATION

The *Rack-mountable VAX 4000 Model 300 Installation / Operator's Manual* is organized in the following manner.

CHAPTER 1, SYSTEM OVERVIEW - Provides an overview of the Rack-mountable VAX 4000 Model Computer System's physical description, the major assemblies, and the controls and indicators.

CHAPTER 2, INSTALLATION - Discusses site preparation, unpacking and checking the shipment, installing the equipment in the enclosure, setting system controls, connecting additional devices, cabling, connecting power, turning on the system, and selecting a language.

CHAPTER 3, MAINTENANCE PROCEDURES - Discusses maintenance procedures and how to remove and replace the various Field Replaceable Units (FRUs).

RELATED DOCUMENTATION

Title	Order No.
VAX 4000 Model 300 Installation	EK-335AA-IN*
VAX 4000 Model 300 Operation	EK-336AB-OP*
VAX 4000 Troubleshooting and Diagnostics	EK-386AA-TS*
KA670 CPU Systems Maintenance	EK-347AA-MG
KA670 CPU Module Technical Manual	EK-KA670-TM*
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 Installation and Operations	AA-LB35B-TE
VAXELN Host System Guide	AA-JG87B-TE
VAXELN Run-Time Facilities Guide	AA-JM81B-TE
VAX Architecture Handbook	EB-19580-20
VAX Software Handbook	EB-21812-20

*This manual is included in your shipment.

Documentation specific to supported options is listed with the option in the *VAX 4000 Model 300 Technical Information* manual.

CONVENTIONS

The following conventions are used in this manual:

Convention	Meaning
<key>(key)	A symbol denoting a terminal key used in text and examples in this book. For example, <key>(Break) indicates that you press the Break key on the terminal keypad. <key>(Return) indicates that you press the Return key on the terminal keypad.
BOLD	This bold type indicates user input. For example: **>>> BOOT MUAO** This line shows that the user must enter BOOT MUAO at the console bulkhead assembly.
NOTE	A note calls the reader's attention to any item of information that may be of special importance.
CAUTION	A caution contains information essential to avoid damage to the system.
WARNING	A warning contains information essential to the safety of personnel.

The following symbols appear on the power supply. Please review their definitions below:

This warning symbol indicates risk of electric shock. Voltage, Dangerous (to indicate hazards from dangerous voltage).

This symbol is used to alert readers about specific safety conditions, and instruct the reader to read separate instructional material.

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

This equipment has not been designed for connection to an IT power system (a power system without a directly grounded neutral conductor).

This equipment should be plugged into a properly grounded receptacle only.

This system contains an automatic voltage select power supply. Voltage selection is not required prior to installation.

CAUTION

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

NOTE

If you are installing an R400X expander with your VAX 4000 Model 300 system, use this manual to install your VAX 4000 Model 300. When you complete step 7, begin to install your expander as described in the *R400X Expander Addendum*, which is shipped with your expander. You will not need to return to this manual.

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

A glossary is available in the *VAX 4000 Model 300 Operation* manual to help with word definitions and acronyms.

The Rack-mountable VAX 4000 does not specifically support a dual-host configuration.

FCC USER STATEMENT

NOTICE:

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


СНАР 1

Chapter 1

SYSTEM OVERVIEW

1.1 INTRODUCTION

This chapter presents an overview of the Rack-mountable VAX 4000, Model 300 Computer System.

The Rack-mountable VAX 4000, Model 300 Computer System (see Figure 1–1) houses all components in a BA441 enclosure. Figure 1–2 shows the dimensions of the enclosure. This enclosure is a slide mounted chassis that fits into a standard 48.26-cm (19-inch) GIA enclosure and houses the following major units:

- System ON/OFF switch
- Mass storage shelf
- Card cage
- Console bulkhead assembly
- DSSI and SCSI connectors
- Power supply
- Fans
- System Control Panel (SCP)
- Central Processing Unit (CPU) module
- Memory modules

The BA441 enclosure containing the Rack-mountable VAX 4000, Model 300 Computer System can also contain the following options:

- Communications controller modules
- Tape drive controller module
- Console bulkhead assembly
- RF-series Integrated Storage Equipment
- TK70 tape drive

Up to four RF-series Integrated Storage Equipment (ISEs) or three RF-series ISEs and a TK70 tape drive can be mounted inside the BA441 enclosure.

Figure 1–1: Front View of the BA441 Enclosure

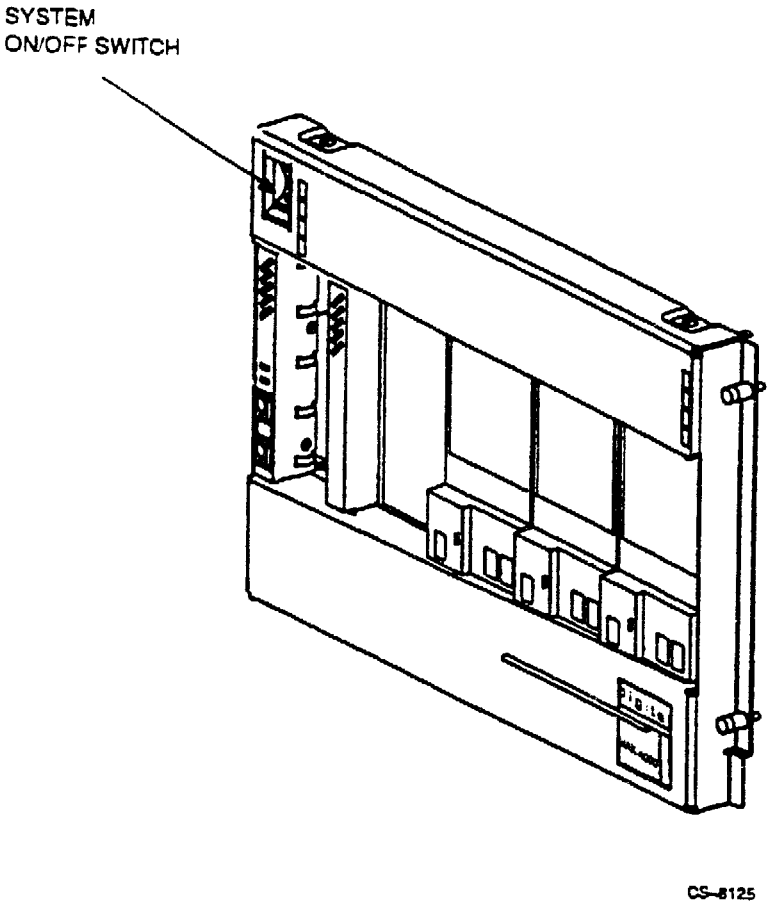
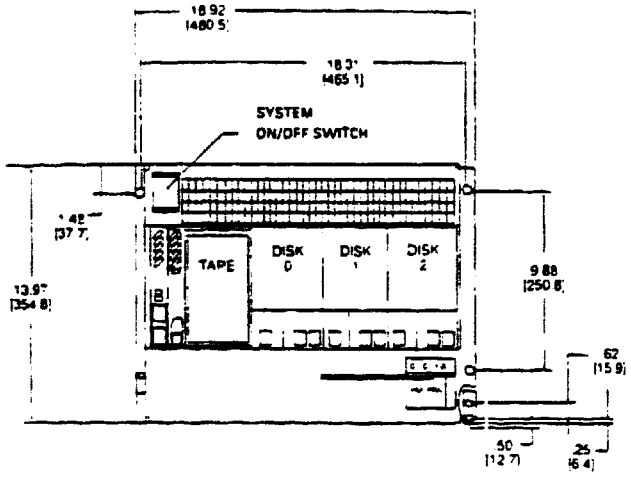
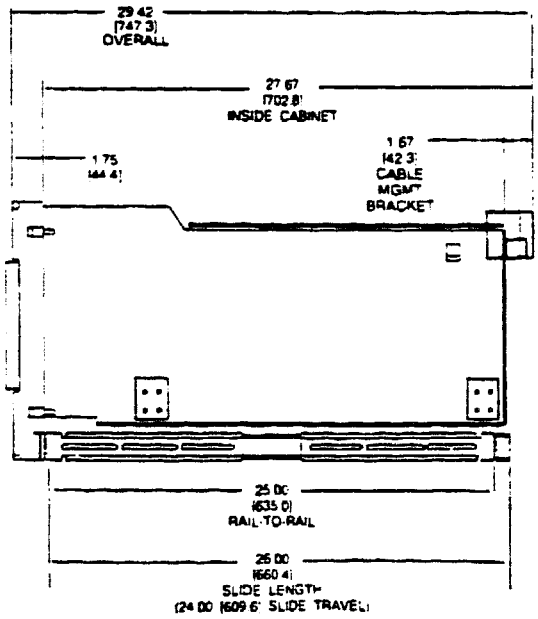


Figure 1–2: Dimensions of the BA441 Enclosure

FRONT VIEW



SIDE VIEW



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1.2 MAJOR UNITS

The following subsections describe the VAX 4000 system's major units and their functions. A full description on how to use the system and options can be found in the *VAX 4000 Model 300 Operation* manual.

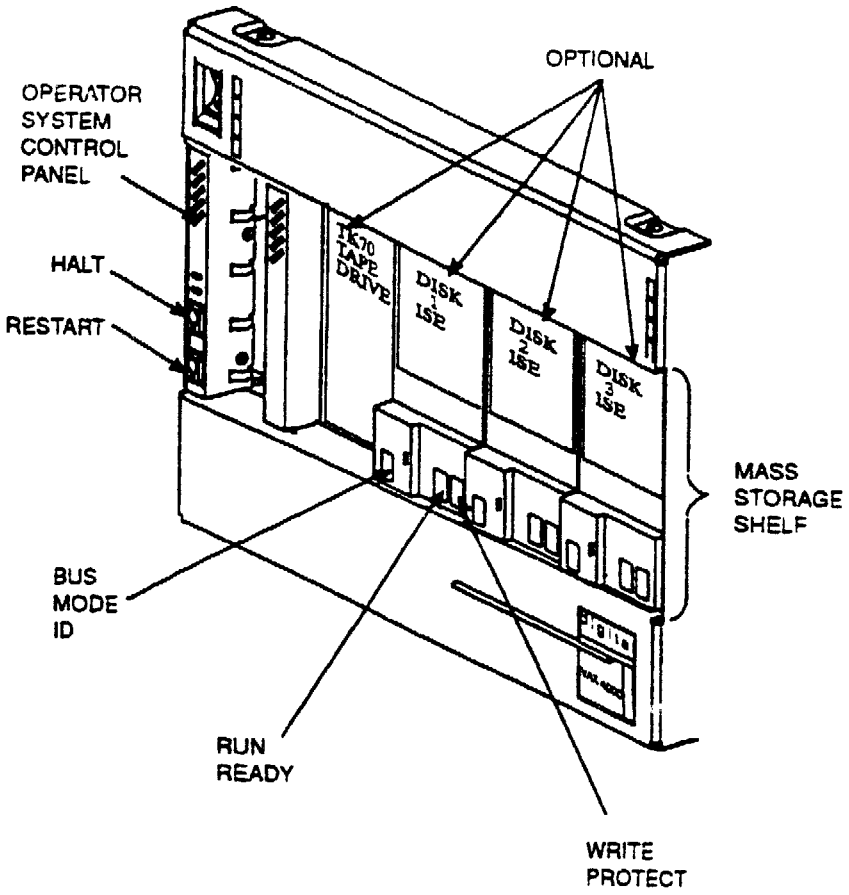
1.2.1 System ON/OFF Switch

The main system ON/OFF switch is located in the upper left-hand corner of the front panel (see Figure 1–1). This switch is the main power switch for the entire system.

1.2.2 Mass Storage Shelf

The mass storage shelf extends across the front of the enclosure. The shelf contains a System Control Panel (SCP), optional TK70 tape drive, and up to three RF-series ISEs (tapeless systems can have up to four RF-series ISEs). Each ISE has its own panel with controls and indicators. Instructions for using ISEs and the TK70 tape drive can be found in the *VAX 4000 Model 300 Operation* manual. The SCP is to the left of the storage devices. Figure 1–3 shows the mass storage shelf.

Figure 1–3: Mass Storage Shelf



The SCP has two indicators: the DC OK light and the Over Temperature Warning light. The green DC OK light indicates that the power supply voltages are within the correct operating range. If the DC OK light is not lit when the system power is on, check the system ON/OFF switch on front bezel (refer to Section 1.2.1) and the circuit breaker on the power supply, then refer to the *VAX 4000 Troubleshooting and Diagnostics* manual (EK-386AA-TS).

The red Over Temperature indicator flashes to indicate that the system's internal temperature is approaching a level that may cause system components to overheat. In addition to the flashing Over Temperature Warning light, an audible alarm also provides warning of a possible over temperature condition. If the components continue to heat, the system will automatically shut down to prevent components from being damaged. Instructions for turning on the system after a preventive shutdown due to overheat conditions are covered in more detail in the *VAX 4000 Model 300 Operation* manual (EK-336AB-OP).

Below the indicators are the Halt and Restart buttons. 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, type "c <key>(Return)" to continue. The *VAX 4000 Model 300 Operation* manual (EK-336AB-OP) 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 console bulkhead assembly.

Below the Halt button is the Restart button. The Restart button has a green indicator. When you press the Restart button, the system returns to a power-on 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 covered in the *VAX 4000 Model 300 Operation* manual (EK-336AB-OP).

NOTE

The Halt and Restart buttons can be disabled to prevent accidental activation. Contact your Digital service representative if you want to disable the controls on the SCP.

1.2.3 Card Cage

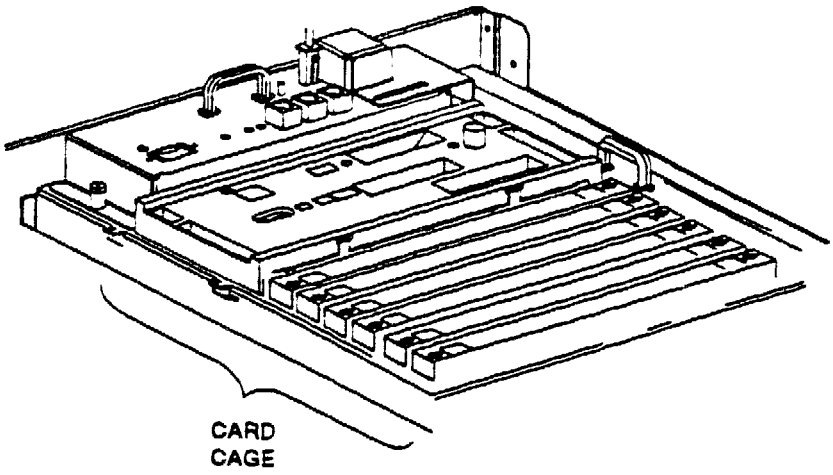
The modules in your system are mounted in a 12-slot card cage behind the mass storage shelf, as shown in Figure 1–4.

The first four slots are reserved for memory modules. The fifth slot is reserved for the CPU. A console bulkhead assembly with system controls and connectors covers these first five slots. Slots 6 through 12 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. Together the covers form a shield with a three-fold purpose:

1. To protect external devices from electrical interference generated by the system.
2. To protect the system from electrical interference generated by external devices.
3. To maintain air flow integrity.

Figure 1–4: Card Cage



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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 such as mass storage controllers 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 over the top of the BA441 enclosure and towards the back, where the cables are split into individual lines. These connections are described in more detail in the *VAX 4000 Model 300 Operation* manual (EK-336AB-OP).

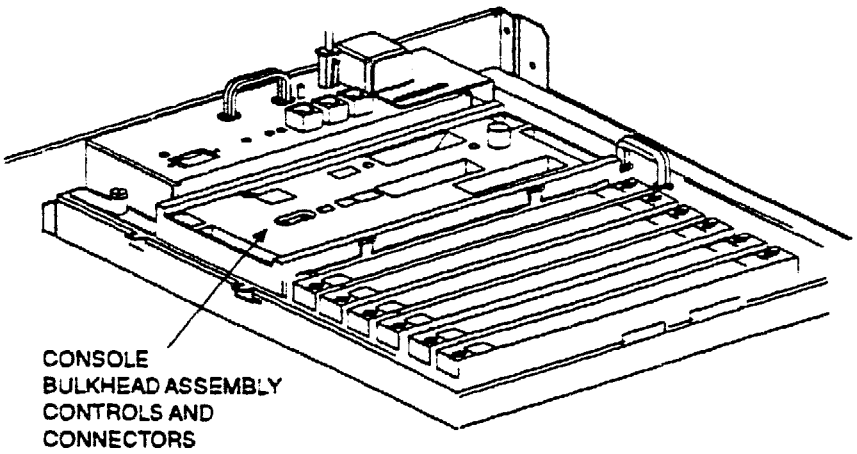
1.2.4 Console Bulkhead Assembly

Your system can have up to four memory modules. The memory modules occupy the first four slots of the card cage and are followed by the CPU. The memory and CPU modules are below the console bulkhead assembly that covers the first five slots. The console bulkhead assembly, shown in Figure 1–5, has several system controls and indicators.

NOTE

These components are visible when the chassis is extended and viewed from the top (see Figure 1–5).

Figure 1–5: Console Bulkhead Assembly Controls and Connectors



The console bulkhead assembly has the following components.

- Power-On Mode switch — This three-position rotary switch determines how the system responds at power-on:

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-on 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-on. This setting requires special loopback connectors and is for Digital Customer Services use only.

- Baud Rate Select switch — The Baud Rate Select switch is used to set the system's baud rate to match that of the console terminal. The factory setting is position 5 (9600).

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-on.

Break Enable/Disable switch — When the switch is down (position 0), breaks are disabled. When the switch is up (position 1), breaks are enabled. When breaks are enabled, pressing <key>(Break) on the console terminal halts the processor and transfers control to the console program. Using the console command *SET CONTROL*, you can specify the control character <key>(Ctrl/C) rather than <key>(Break) to initiate a break signal.

The Break Enable/Disable switch also controls what happens at power-on. When breaks are disabled (down, position 0), the system attempts to automatically boot software at power-on. When breaks are enabled (up, position 1), the system enters console mode (indicated by the >>> prompt) at power-on.

Using the console command *SET HALT REBOOT* or *SET HALT RESTART_REBOOT*, you can set your system to automatically boot software after the system is halted by pressing <key>(Break).

Bus node ID plugs — VAX 4000 systems have two separate Digital Storage System Interconnect (DSSI) buses. Two DSSI bus node ID plugs, one for the internal DSSI bus (Bus 0) and one for the external bus (Bus 1), identify the bus node to the CPU. These plugs are configured at the factory. For single-host systems, Bus 0 is identified as bus node 6, bus 1 is identified as bus node 7; for dual-host systems, both buses on the first host are identified as bus node 7, and both buses on the second host are identified as bus node 6.

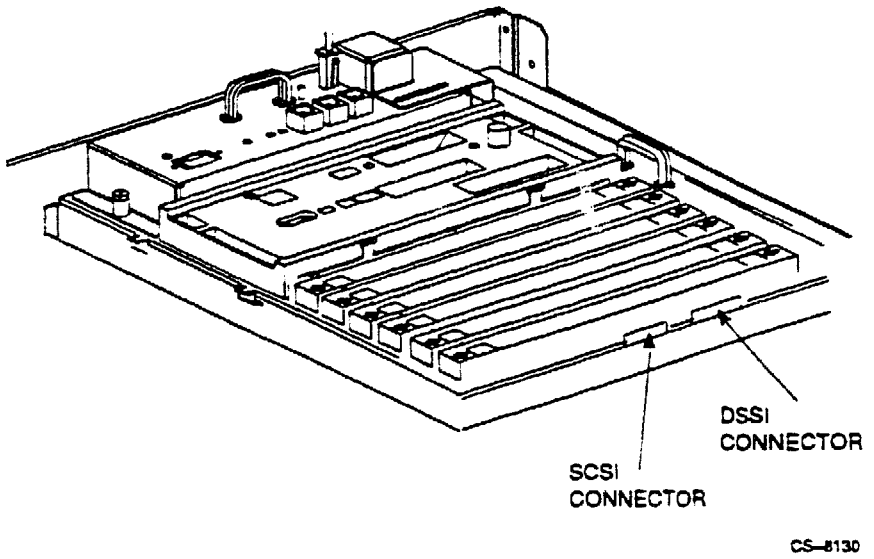
- DSSI connectors (DSSI Bus 1) — Two Digital Storage System Interconnect (DSSI) connectors, labeled X and Y on the console bulkhead assembly, allow you to expand your system by connecting additional mass storage devices to the second DSSI bus.

Ethernet connectors — The console bulkhead assembly 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.

1.2.5 DSSI and SCSI Connectors (DSSI Bus 0; SCSI Bus 0)

To the right of the card cage are the DSSI and SCSI connectors for their respective Bus 0. Bus 0 provides the DSSI and SCSI bus for ISEs installed in the system enclosure. The connectors allow you to expand your system by connecting additional mass storage devices to the bus. You can also share mass storage devices with a second system by forming a dual-host configuration. Figure 1–6 shows the locations of the DSSI and SCSI connectors for Bus 0.

Figure 1–6: Connectors for DSSI Bus 0 and SCSI Bus 0



1.2.6 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.

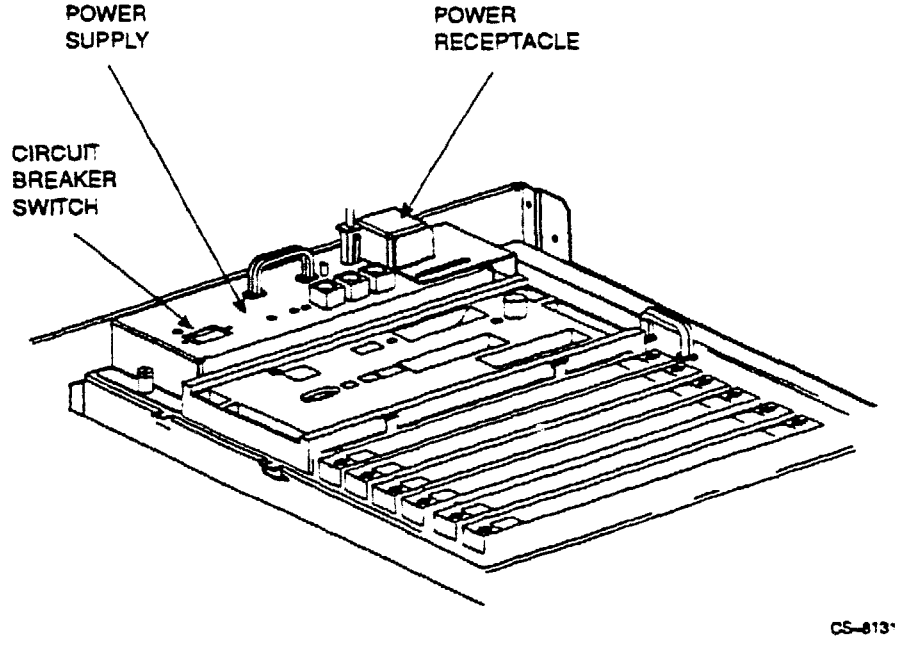
To prevent damage due to overheating, the power supply monitors the internal temperature and the speed of the fans. If the power supply detects overheating or a fan failure, the power supply will shut down the system.

Figure 1–7 shows the controls and indicators on the power supply.

NOTE

These controls and indicators are visible when the chassis is extended and viewed from the top (see Figure 1–7).

Figure 1–7: Power Supply Controls and Indicators



The controls and indicator lights function as follows:

Power supply circuit breaker — This power supply circuit breaker is used to turn the power supply on and off. The OFF position is indicated by a O; the ON position is indicated by a I.

NOTE

The power supply circuit breaker must be in the 'I' position at all times.

In the event of a power surge, the breaker will trip, causing the system ON/OFF switch to return to the OFF position (O). Turning the system ON (I position) resets the circuit breaker. If the circuit breaker trips, wait one minute before turning the system back ON.

AC Present indicator — The orange AC Present indicator lights when the system ON/OFF switch and power supply circuit breaker are set to ON and voltage is present at the input of the power supply. If the AC Present indicator does not light when the ON/OFF switch and power supply circuit breaker are set to ON, refer to the *VAX 4000 Troubleshooting and Diagnostics* manual (EK-386AA-TS).

⎓ 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 switches are set to ON, refer to your *VAX 4000 Troubleshooting and Diagnostics* manual.

Fan Failure indicator — The amber Fan Failure indicator lights if either of the two cooling fans stop working. The power supply will automatically shut down the system as a precautionary measure when a fan failure is detected. Call your Digital service representative if a fan failure occurs.

Over Temperature Condition indicator — The amber Over Temperature Condition indicator lights if the enclosure has shut down due to an over temperature condition.

- Power bus connectors — There are three power bus connectors. Two of these power bus connectors (MO and SO) allow you to configure a power bus for systems expanded with the R400X expander. The power bus allows you to turn power on and off for one expander through the power supply designated as the main power supply: this way, one power switch can control power for an entire expanded system. The third power bus connector (SI) is used to connect to the system's ON /OFF switch, enabling you to turn the system on from the front panel. Therefore, the SI connector is not available for system expansion. Figure 1–8 illustrates a possible power bus configuration for an expanded system.

NOTE

Dual-host systems should not be configured with a power bus. Inadvertently shutting off a host system defeats the added reliability of a dual-host system.

MO The main out (MO) connector sends the power control bus signal to the expander. One end of a power bus cable is connected here, the other end is connected to the secondary in (SI) connector of an expander power supply.

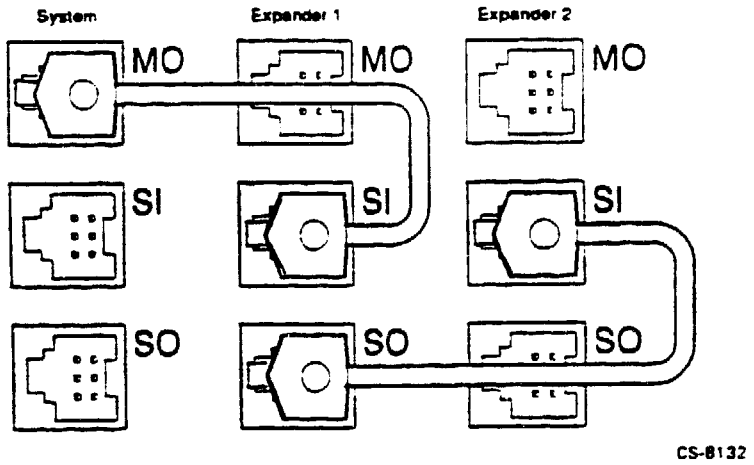
SI The secondary in (SI) connector receives the power bus control signal from the main power supply. In a power bus with more than one expander, the power control bus signal is passed along, using the secondary in and out connectors shown in Figure 1-8.

NOTE

The SI connector is not available for system expansion.

SO The secondary out (SO) connector sends the signal down the power bus for configurations of more than one expander.

Figure 1–8: Sample Power Bus Configuration



1.2.7 Fans

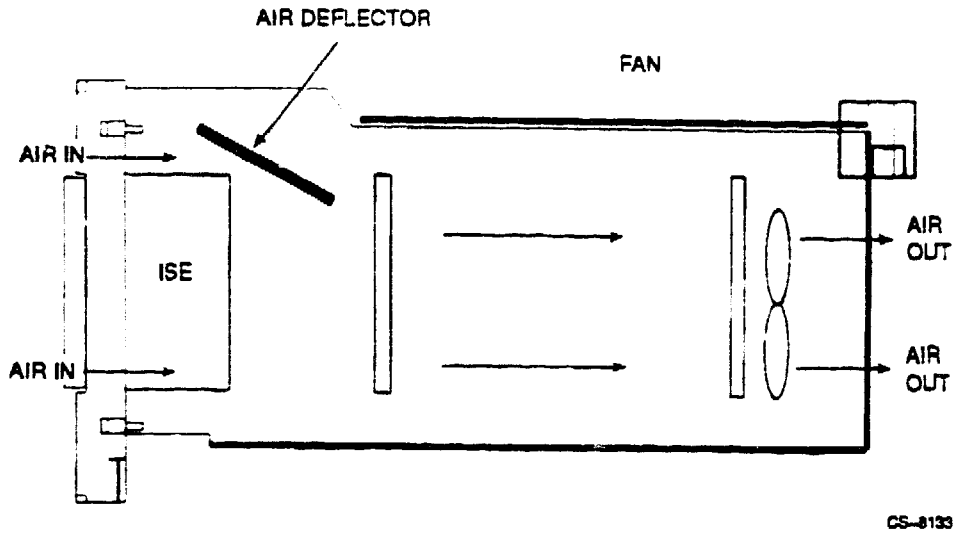
Two fans located behind the card cage draw air in through the front of the chassis, through the card cage, and out the rear. The speed of the fans varies, depending on the surrounding room temperature. To reduce the load on the fans, keep the system away from heat sources. Figure 1–9 shows the air flow through the system enclosure.

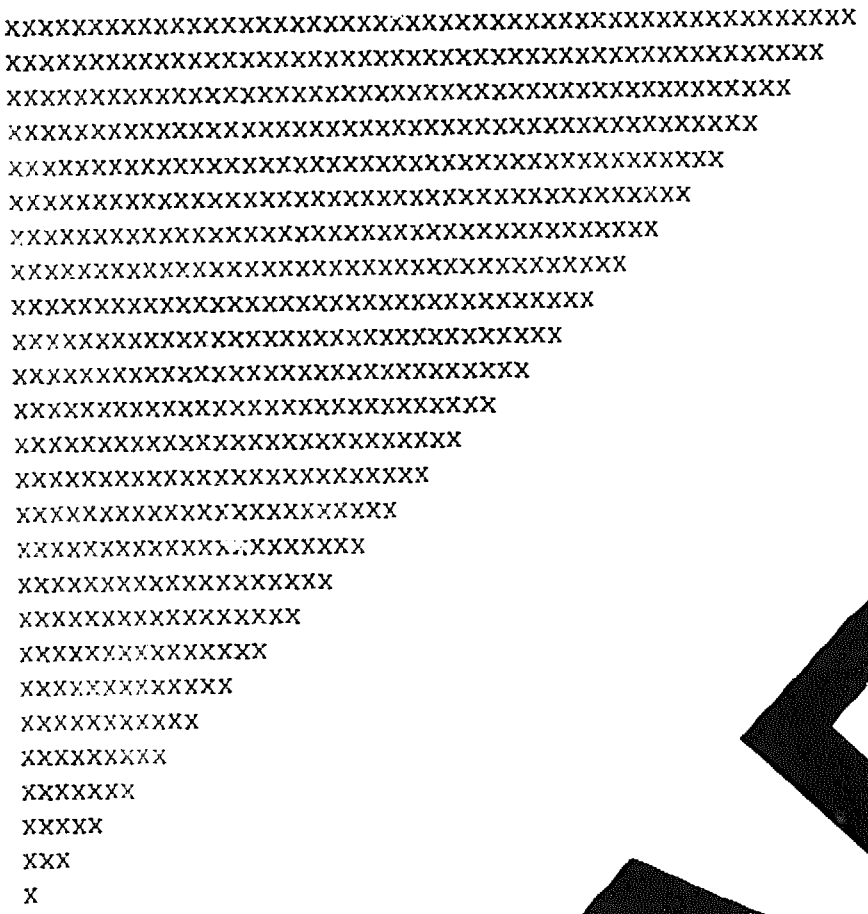
NOTE

The power supply monitors the fans. If either fan stops working, the Fan Failure indicator on the power supply lights, and the system automatically shuts down as a precautionary measure. Call your Digital service representative if a fan fails.

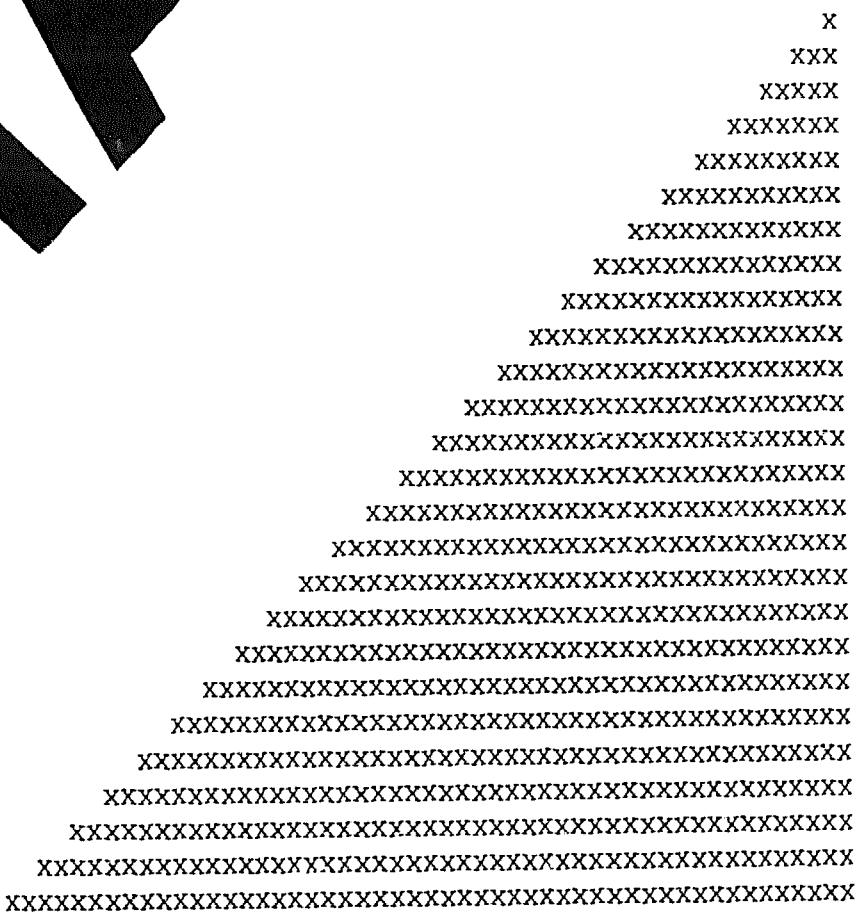
The fan speed control can be set so that the fans will run at their maximum speed. This setting is recommended if you want potentially higher system module reliability, and do not object to the increased fan noise. Contact your Digital service representative to override the fan speed control.

Figure 1–9: System Air Circulation





CHAP 2



Chapter 2

INSTALLATION

This chapter describes the procedures to follow when installing the Rack-mountable Rack-mountable VAX4000 Model 300 in a standard cabinet.

2.1 VERIFY SITE PREPARATION

The installation instructions assumes that the site meets all the Rack-mountable VAX4000 Model 300 installation requirements.

2.2 TOOLS REQUIRED

You will need the following tools to install the equipment:

- Scissors
- Flat blade screwdriver
- Phillips screwdriver
- Adjustable wrench
- Set of nut drivers

2.3 CHECK THE SHIPMENT

NOTE

Save all packing materials in case you need to return the system for service or reship the system.

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

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 boxes in your shipment.

Check the contents of each carton against the Content Listing on its side to ensure you received all items.

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

Figure 2–1 shows the contents of the shipping carton. Your shipment may include several cartons. One carton contains the system and another carton contains hardware documentation, software documentation, system software, diagnostic software, and software licenses.

NOTE

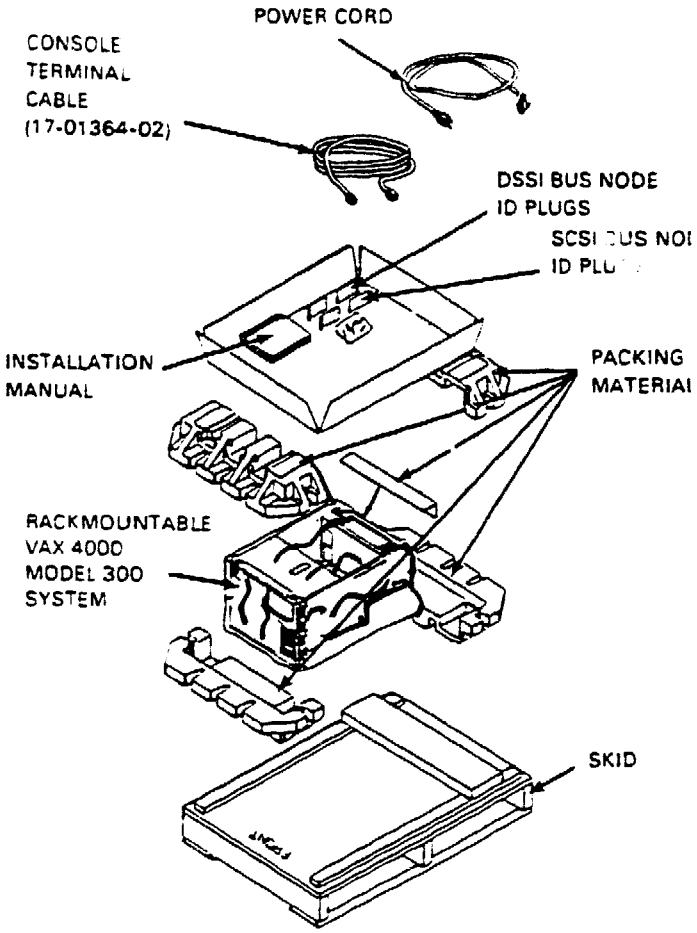
Depending on your order, your shipment may also include some of the following devices:

- **Terminal(s)**
- **Printer(s)**
- **Modem(s)**
- **CPU system enclosure**
- **Various options**

Table 2–1: Hardware Cross-Reference List

Part Number	Description	Quantity
Supplied with slide kit	8-32 x 5/16 screws	8
	#8 flat washers	8
	8x32 hex nuts	8
74-43410-10	washer plate	4
	#8 lock washers	8
90-07786-00	#10 U-nuts	4
90-00063-43	10-32 Trusshead screws	8
90-00063-78	6-32 x 5/16 screws	18
90-06565-01	10-32 KEP nuts	8
74-43410-01	washer plate	4
90-06243-09	1/4-20 screws	8
74-43949-01	nut plate	4
74-43957-01	bracket interlock	1

Figure 2–1: Shipping Carton Contents



2.4 INSTALLING THE RACK-MOUNTABLE VAX4000 MODEL 300

This section discusses the installation of the equipment slides in the cabinet and mounting the Rack-mountable VAX4000 Model 300 onto the equipment slides.

After unpacking the Rack-mountable VAX4000 Model 300, install it as described in the following sections.

2.4.1 Installing Equipment Slides

Remove the following material from the slide carton:

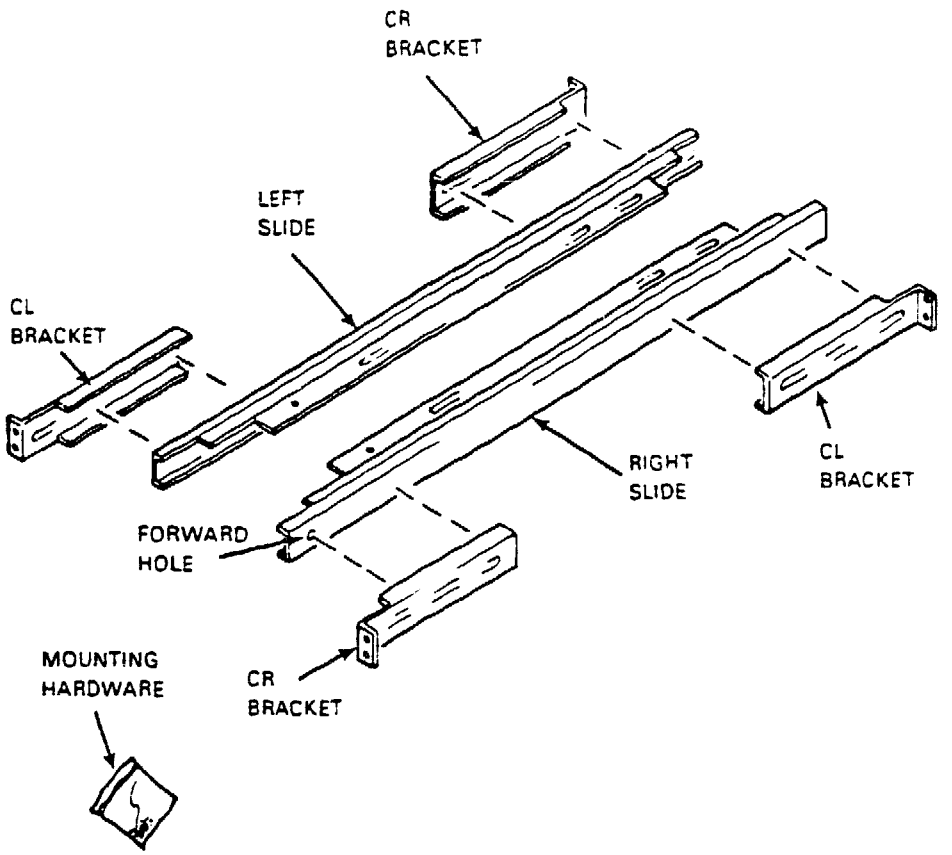
- One pair of slides (one right-hand slide and one left-hand slide)
- Four mounting brackets (two CR brackets and two CL brackets)
- Package containing the hardware

To install the equipment slides in the enclosure:

1. Extend the right-hand slide to gain access to the slide lock. Lift up on the slide lock (located on the inside of right-hand slide assembly) and remove the inner slide race (see Figure 2–2). The slide assembly must be extended in order to insert screw.
2. Mount the CR bracket to the outside of the right-hand chassis slide and position the CR bracket so that it is flush with the front end of the chassis slide.
3. Align the screw hole in the CR bracket over the first single forward screw hole in the forward end of the equipment slide (see Figure 2–2).
4. Secure the CR bracket to the front end of the right chassis slide using an 8-32 x 5/16-inch screw, flat washer, split ring lock washer and nut. Insert the screw from the inside of the slide. Use a nut driver to tighten the nut on the outside of the CR bracket (see Figure 2–2).
5. Install the mounting hardware in the center slot in the CR bracket. Insert the screw from the inside of the slide. Use a nut driver to tighten the nut on the outside of the CR bracket (see Figure 2–2).
6. Mount the CL bracket to the outside of the right hand chassis slide and position the CL bracket so that the end hole, on the chassis slide, is in line with the rear slot of the CL bracket (see Figure 2–2).

7. Install two 8-32 x 5/16-inch screws, flat washers, split washers and nuts in the front and rear slots of the CL brackets. Install the screws from the inside of the slide. Do not tighten the screws at this time (see Figure 2–2).
8. Extend the left-hand slide to gain access to the slide lock. Lift up on the slide lock (located on the inside of the left-hand slide assembly) and remove the slide (see Figure 2–2).
9. Mount the CL bracket to the outside of the left hand chassis slide and position the CL bracket so that it is flush with the front end of the chassis slide.
10. Align the screw hole in the CL bracket over the single forward screw hole in the forward end of the equipment slide (see Figure 2–2).
11. Mount the CR bracket to the outside of the right-hand chassis slide and position the CR bracket so that the end hole, on the chassis of the slide, is in line with the rear slot of the CR bracket (see Figure 2–2).
12. Install two 8-32 x 5/16-inch screws, flat washers, split washers and nuts in the front and rear slots of the CR brackets. Install the screws from the inside of the slide. Do not tighten the screws at this time (see Figure 2–2).
13. Install the second screw in the center slot in the CR bracket. Insert the screw from the inside of the slide. Do not tighten the nut on the outside of the CR bracket at this time (see Figure 2–2).
14. Determine where the equipment will be located in the cabinet. The Rack-mountable VAX4000 Model 300 must be installed using the upper hole which is spaced 0.50 inch from the hole below it. This upper hole (see Figure 2–3) is the position for the first 1/4-20 screw. The RETMA hole spacing allows more than one location in an enclosure.

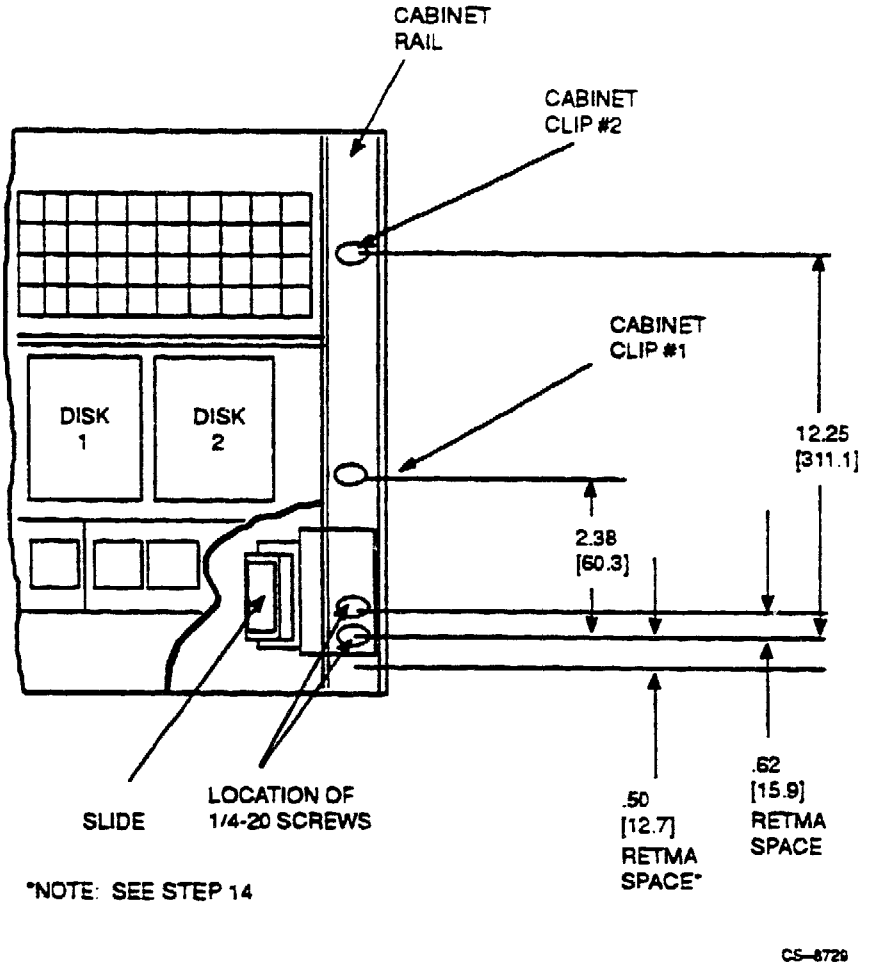
Figure 2–2: Equipment Slide Assembly



NOTE

The hardware for installing the slides to the cabinet rails is located in the hardware kit (P/N 70-28616-01).

Figure 2–3: Installation Dimensions



15. Install the slide mounting brackets on the inside surface of the cabinet rails (see Figure 2–4). Assemble the washer plate and screws on the front surface of the cabinet rail. The screws pass through the front washer plate, cabinet, slide bracket, and thread into the nut plate. The nut plate is installed so that the smallest hole-to-edge distance is down.

16. Position the right-hand slide as shown in Figure 2–3 and secure it in two places, front and rear. Torque the 1/4-20 screws to 50-in-lb.

NOTE

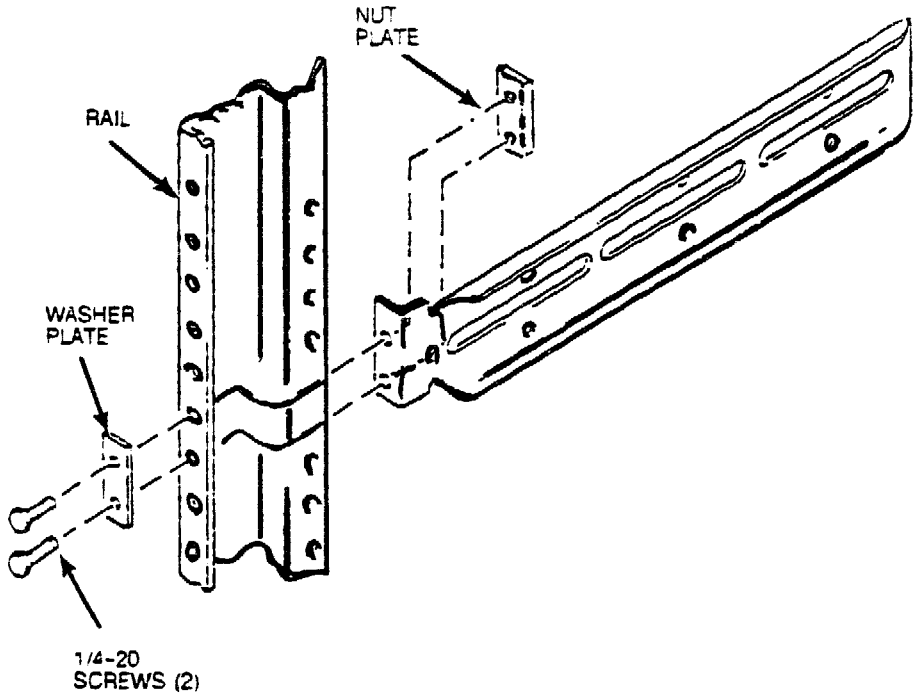
Ensure that you pull the slide upwards when securing it to the rails. Also, ensure that the slide is level and at the same height within the cabinet.

17. Repeat step 16 for mounting the left-hand slide in the cabinet.

18. Extend the equipment slide all the way out and tighten the hardware (at four separate points) holding the rear CR and CL slide mounting brackets.

19. Install four U-nuts #1 and #2 two places each per Figure 2-3 to secure the bezel to the cabinet.

Figure 2–4: Installing the Slides to the Cabinet Rails



2.4.2 Attaching Chassis Mounting Brackets

NOTE

The hardware for mounting the chassis mounting brackets is located in the hardware kit (P/N 70-28616-01).

Special chassis mounting brackets are required for mounting the chassis to the equipment slides. Perform the steps in the following procedure to install the four slide mounting brackets to the chassis:

WARNING

Use sufficient personnel and proper equipment when lifting or moving the Rack-mountable VAX 4000, Model 300 Computer System. The fully loaded system weighs 53.5 kg (118 lb).

NOTE

In the event that the rack-mountable VAX4000 Model 300 Computer System is to be installed in the Digital H9702 (tall cabinet), one special chassis mounting bracket (P/N 74-43957-01) is supplied and must be installed in the left rear side of the chassis. Follow the same instructions used in installing the standard chassis mounting brackets.

1. Lift the chassis to a flat work surface and place the chassis on blocks to raise its lower edge above the surface, approximately 3.81 cm (3 inches).
2. Position the mounting bracket in the indentation on the lower side of the chassis. There are two indentations on each side of the chassis. Position each of the brackets so that the two 10-32 x 3/8 inch studs are pointing down, and the long protrusions are pointing toward each other (see Figure 2-5).
3. Secure the chassis mounting bracket in place with four 6-32 x 5/16 inch screws.
4. Repeat steps 2 and 3 for each of the remaining three brackets.

2.4.3 Mounting Chassis on Equipment Slides

Perform the steps in the following procedure to install the chassis onto the equipment slides:

WARNING

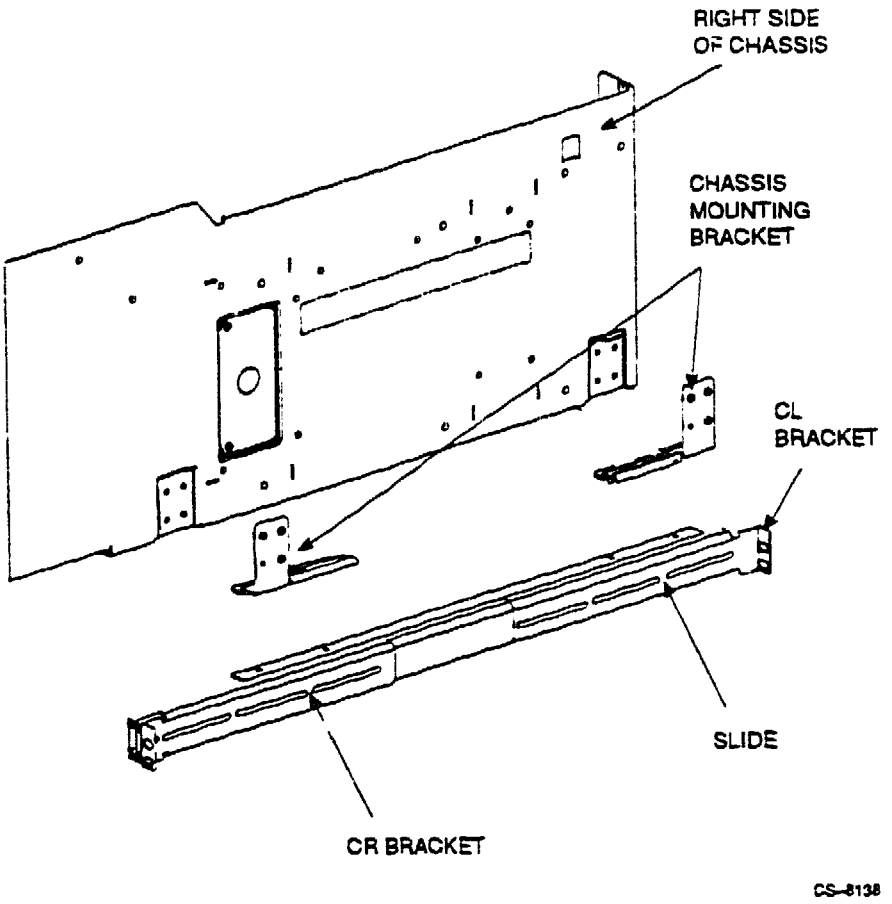
Use sufficient personnel and proper equipment when lifting or moving the Rack-mountable VAX 4000, Model 300 Computer System. The fully loaded system weighs 53.5 kg (118 lb).

CAUTION

Before installing the chassis into the cabinet, ensure that the stabilizer foot, located at the lower front of the cabinet, is extended in the fully deployed position.

1. Push both equipment slides to the fully extended position. Ensure that both slides are locked in the extended position.
2. Lift the chassis and position it so that the two studs, in the two forward chassis mounting brackets, are aligned directly over the forward holes in each of the two equipment slides (see Figure 2–5).
3. Position the two studs in the two rear chassis mounting brackets directly over the rear slots in each of the two equipment slides (see Figure 2–5).
4. Lower the chassis.
5. Secure the #10 KEP nuts with lockwashers over the eight studs and tighten, using a 3/8-inch socket wrench.
6. Push the slide locking bars up and slide the chassis into the cabinet.

Figure 2–5: Mounting the Chassis on Equipment Slides



2.4.4 Installing the Cable Management Bracket

Perform the steps in the following procedure to install the cable management bracket (see Figure 2–6):

1. Position the cable management bracket at the top of the fan exhaust grill at the rear of the chassis.

NOTE

The hardware for attaching the cable management bracket is located in the hardware kit (P/N 70-28616-01).

2. Secure the cable management bracket to the chassis with two 6-32 x 5/16 inch screws.

2.4.5 Installing the Cable Tie Bracket

Perform the steps in the following procedure to install the cable tie bracket (see Figure 2–6):

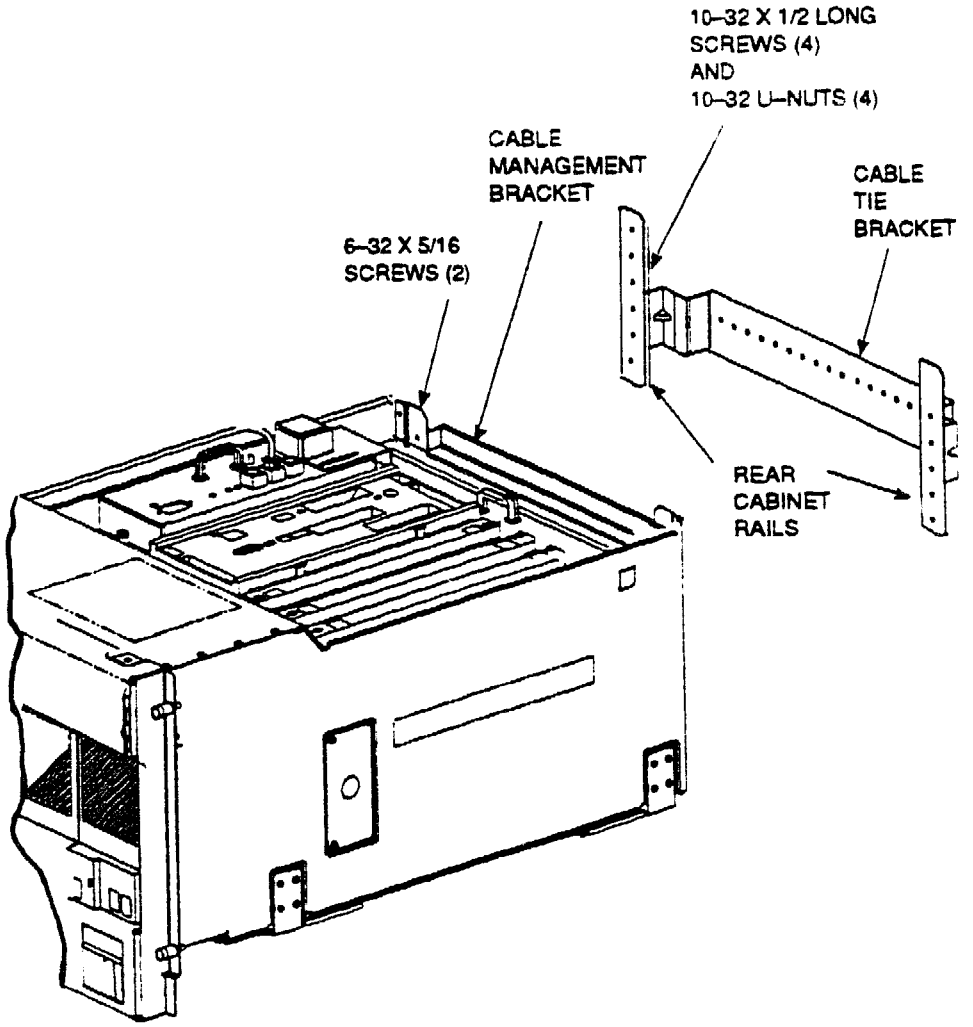
1. Determine where the cable tie bracket is to be positioned (near the cable management bracket) at the rear of the chassis.

NOTE

The hardware for attaching the cable tie bracket is located in the hardware kit (P/N 70-28616-01).

2. Install four #10 U-nuts over the mounting holes in the rear rails of the cabinet, positioned just above the edge of the chassis, in line with the cable management bracket (see Figure 2–6).
3. Position the cable tie bracket over the four U-nuts.
4. Secure the cable tie bracket to the cabinet with four 10-32 x 1/2 inch screws.

Figure 2-6: Installing the Cable Management Bracket

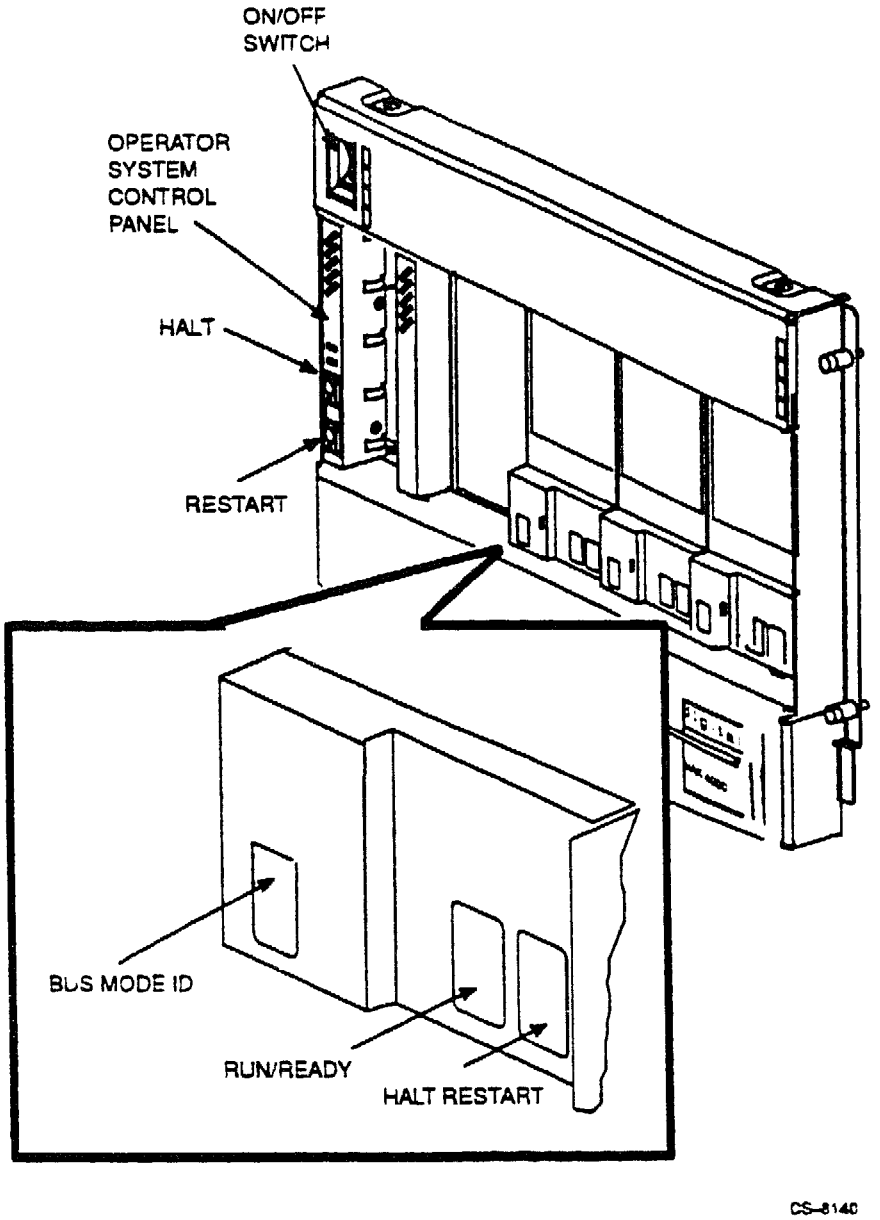


2.5 SET SYSTEM CONTROLS

The system controls are on each mass storage device on the System Control Panel (SCP) and on the console bulkhead assembly. The mass storage devices include the RF-series Integrated Storage Equipment (ISEs) and the tape drive. Each ISE has a Write-Protect button and a Run/Ready button. The console bulkhead assembly contains the Power-On Mode switch, the Baud Rate Select switch, and the Break Enable /Disable switch. The SCP contains the Halt button and Restart button.

All controls are on the front of the system, as shown in Figure 2–7.

Figure 2–7: Rack-mountable VAX 4000 Model 300 Controls and Indicators



All controls are on the front of the system, as shown in Figure 2–7.

etting Controls on the Integrated Storage Equipment (ISEs)

Check the settings on each ISE:

- Write-Protect button. Each RF-series ISE has its own front panel with controls and indicators. The Write-Protect button is on the right side of each front panel. Make sure the Write-Protect button is in the out (write-enabled) position.
- Run/Ready button. The Run/Ready button is to the left of the Write-Protect button. Make sure the Run/Ready button is in the out position.

Setting Controls on the System Control Panel (SCP)

Check the settings on the SCP:

- Halt button. The Halt button is located on the System Control Panel (SCP) to the left of the mass storage devices. The Halt button should be in the out position.

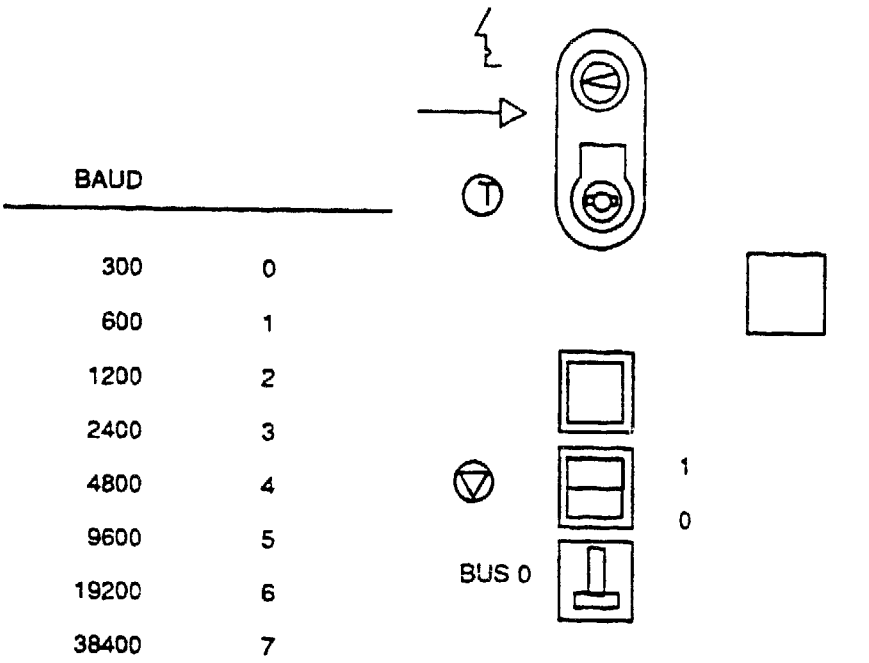
Setting Controls on the Console Bulkhead Assembly

Check the settings on the console bulkhead assembly:

- Power-On Mode switch. This three-position rotary switch determines how the system powers on. The factory setting is Run mode, indicated by an arrow. Set the switch to the Language Inquiry mode (the uppermost position), indicated by a human profile, before you power on the system the first time.
- Baud Rate Select switch. The baud rate switch is below the Power-On Mode switch on the console bulkhead assembly. The factory setting is position 5 (9600). You should have already set the console terminal baud rate to 9600 (see Figure 2–8). The system and the console terminal must be set to the same baud rate to communicate.
- Break Enable/Disable switch. The factory setting is break disabled (down), indicated by O. Leave the switch set to disable while you start the system for the first time, and run diagnostic firmware to test the system. Then set the switch to enable (up), indicated by I. With break enabled, the system automatically enters console mode when powered on, as indicated by the console prompt (>>>).

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

Figure 2–8: Setting Controls on the Console Bulkhead Assembly



2.6 CONNECTING ADDITIONAL DEVICES TO THE SYSTEM

You can connect additional devices at this time, or you can complete the installation and load system software before connecting other devices. If you have an RRD40 compact disk drive that must be installed before you install software, install it now. Otherwise, skip to Section 2.6.8 if you prefer to connect additional devices later. Use the instructions in this step when you are ready to connect the devices.

All connections are made 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 sections explain how to connect each type of device.

To help you make the proper connections, each module cover has an identifying number at the top. The label contains the option number and module number. Table 2–2 lists the identifying numbers for all modules that you may see on your system. Use Table 2–2 to identify the modules as you connect additional devices to the system. Not all modules require additional connections.

Table 2–2: Module Identification Numbers

Module Number	Option Number	Description
L4000–AA	KA670–AA	VAX 4000 Model 300 CPU
L4000–BA	KA670–BA	VAX 4000 Model 300 CPU (server)
L4001–BA	MS670–BA	VAX 4000 memory, 32 megabytes
M8578–00	MRV11	Programmable read-only memory
M3127–PA	DESQA	Ethernet adapter
M3118–YA	CXA16	16-line asynchronous serial interface (RS–423–A, no modem support)
M3118–YB	CXB16	16-line asynchronous serial interface (RS–422, noise immune)
M3119–YA	CXY08	8-line asynchronous serial interface (full modem support)

Table 2–2 (Cont.): Module Identification Numbers

Module Number	Option Number	Description
M3018	DSV11	2-line synchronous serial interface (full modem support)
M3121–PA	DFA01	2-line asynchronous serial interface with integral modem
M7164, M7165	KDA50	Intelligent board controller (RA-series disks and ESE20)
M7559–PA	TQK70	TK70 tape drive controller
M7206–PA	TSV05	TS05 tape drive controller (old)
M7530	TSV05	TS05 tape drive controller (new)
M7740–PA	KLESI	RV20 write-once optical disk (or TU81E tape) controller
M7552–PA	KRQ50	RRD40/RRD50 CDROM tabletop controller
M7500–PA	KMV1A	Programmable data communications interface
M7658–PA	DRQ3B	Real-time parallel interface
M7651–PA	DRV1W	Real-time parallel interface
M7769	KFQSA	DSSI mass-storage adapter
M8020–PA	DPV11	Synchronous serial line interface
M8086–PA	LPV11	Dual parallel printer interface
M8634–PA	IEQ11	IEEE instrument bus DMA controller
M3125–PA	IBQ01–SA	BITBUS-to-Q–bus DMA controller
A1009–PA	AAV11	Digital-to-analog converter
A1008–PA	ADV11	Analog-to-digital converter
A030–PA	ADQ32	Analog-to-digital converter
M4002–PA	KWV11	Programmable real-time clock

Table 2–2 (Cont.): Module Identification Numbers

Module Number	Option Number	Description
A026–PA	AXV11	D/A and A/D converter
M7616	KXJ11	J11 CPU, 512 kilobyte RAM, 64 kilobyte programmable read-only memory, Q–bus peripheral processor
M7130	DTQNA	Broadband token bus network adapter

CAUTION

Do not operate the system without Digital-supplied module covers. The module covers 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.

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

- **The system may overheat due to inadequate 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.**

2.6.1 Connect Terminals and Serial Printers

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

You do not connect the terminals and printers directly to the system, but to a cable concentrator (H3104), which has connections for up to eight terminals and printers. You then connect the cable concentrator to the system with a BC16D cable. Two H3104 cable concentrators and two BC16D cables for each CXA16 module are shipped with the system.

Connect the additional terminals and printers as follows:

1. Find the H3104 cable concentrator and BC16D cable.
2. Feed one end of the BC16D cable under the system box from the back or side and insert it into the connector. If you are going to connect both BC16D cables, connect the first to the connector labeled 8–15 on the CXA16 module cover. If you are going to use only one BC16D cable, connect the cable to the connector labeled 0–7. Lock the connector into place by using the bail latches shown in Figure 2–9.
3. Insert the other end of the BC16D cable into the cable concentrator. Lock the connector into place by using the bail latches.
4. Connect each printer and terminal cable directly to one of the modified modular jacks on the cable concentrator, as shown in Figure 2–10.
5. If you have not already done so, connect the remote terminal or printer to the other end of the cable. The terminal or printer documentation shows how to connect the cable. If the printer or terminal does not have a modified modular jack connection, use a passive adapter (H8571–A), available in 25- and 9-pin models.

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

Figure 2–9: Connecting Devices to the CXA16 Module

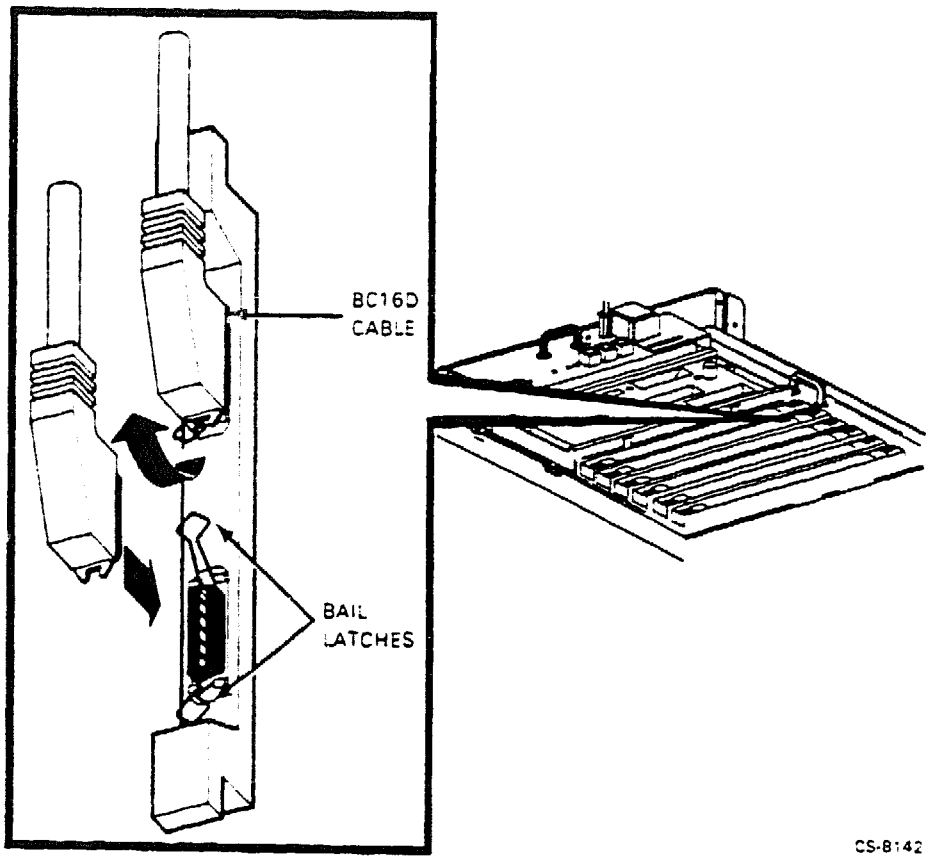
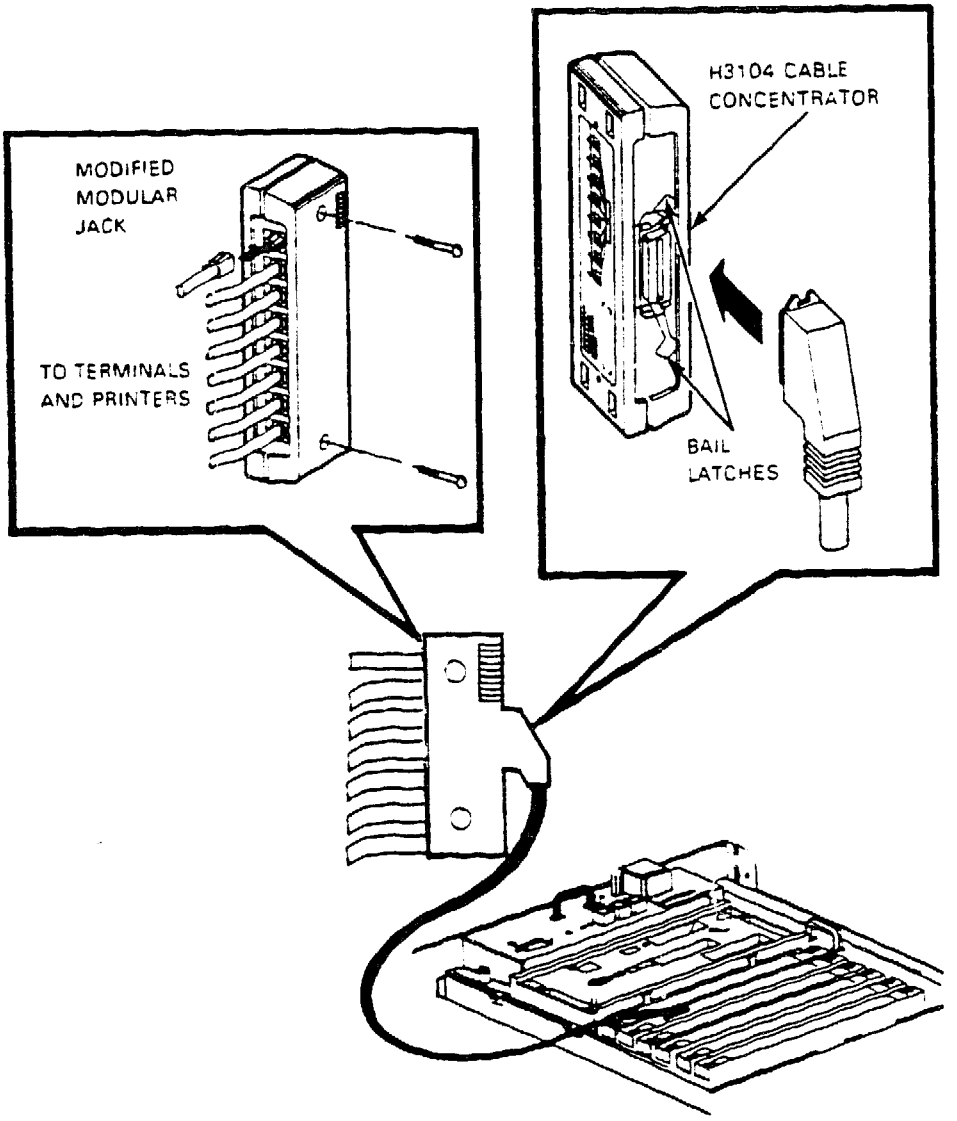


Figure 2–10: Connecting Devices to the Cable Concentrator

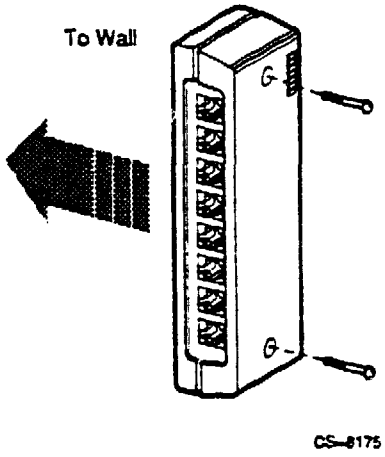


You can mount the cable concentrator on a wall. Wall mounting enables you to keep cables off the floor. Use two screws, as shown in Figure 2–11.

NOTE

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

Figure 2–11: Mounting the Cable Concentrator



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2.6.2 Connect Parallel Printers to the System

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

1. Find the BC27L–30 cable(s).
2. Feed one end of the first BC27L cable under the system box from the back or side. Insert it into the connector labeled J1 on the LPV11 module cover. Lock the connector into place by using the bail latches.
3. Insert the other end of the BC27L 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 LPV11 module cover.

2.6.3 Connect Synchronous Modems to the System

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

Connect a synchronous modem to a DSV11 module using the protocol-specific adapter and extension cables as follows:

1. Feed the socket end of the 0.6 m (24 in) adapter cable (BC19–B/–D/–E/–F) under the system unit from the back or side and connect it to the DSV11 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 the modem documentation for the location of the connector, and for instructions on using the modem.

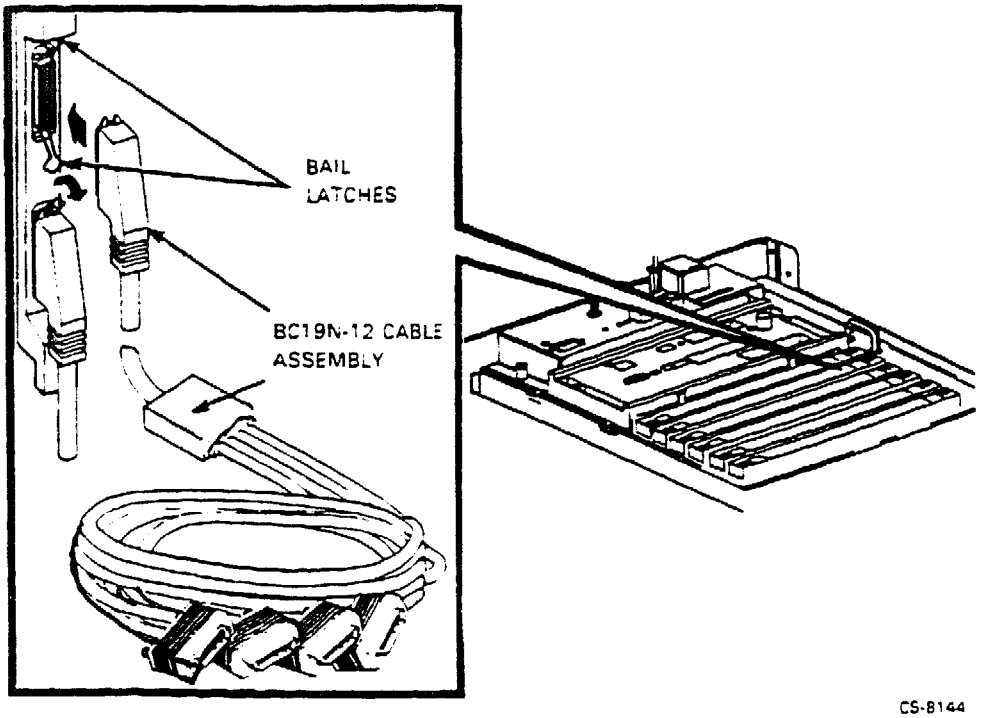
2.6.4 Connect Asynchronous Modems to the System

You connect asynchronous modem lines to the CXY08 module, which supports up to eight lines. To connect a modem to a CXY08 module, see Figure 2–12 and refer to the following instructions:

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

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

Figure 2–12: Connecting a Modem to a CXY08 Module



2.6.5 Connect 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 allow you to connect private integral modems to the public switched telephone network. Call your Digital representative for information on modem availability in your country.

DFA01 Modem

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

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

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

NOTE

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

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

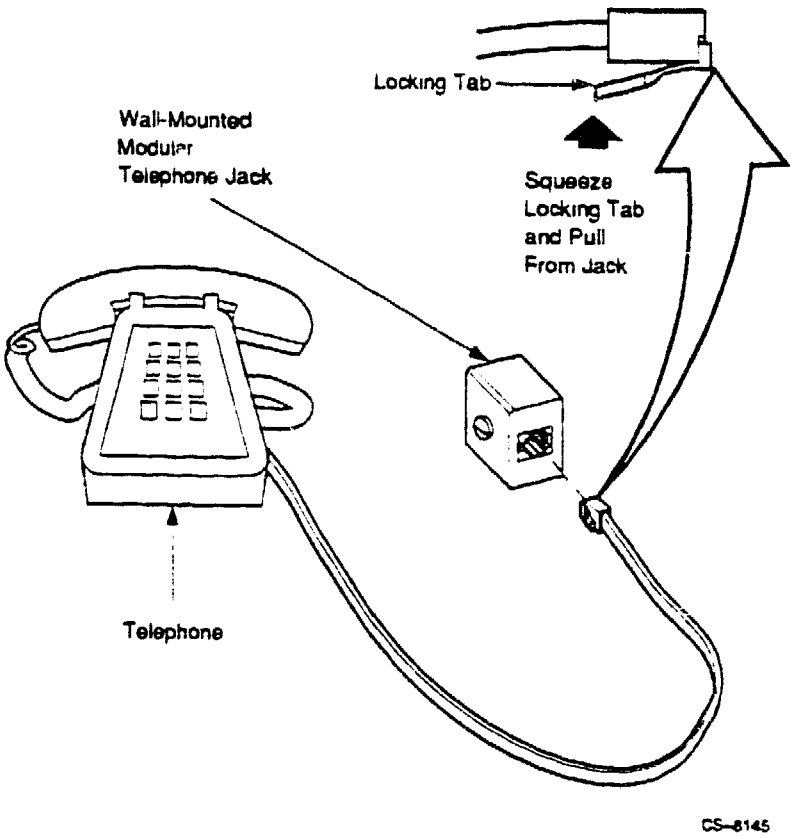
Use the following procedure to connect the DFA01 modem to RJ11C /CA11A, RJ12C/CA12A, or RJ13C/CA13A service.

NOTE

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

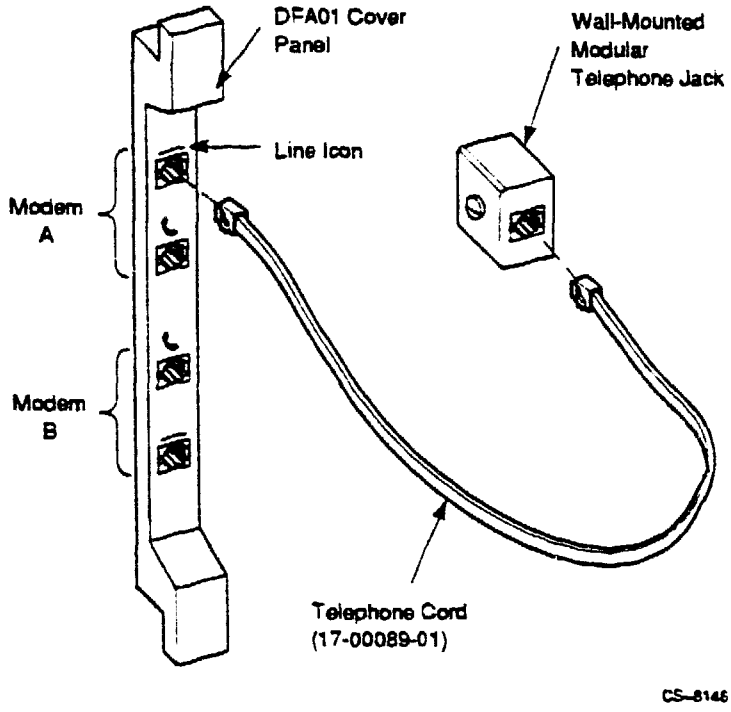
1. Disconnect the telephone line from the wall-mounted modular telephone jack. Leave the other end of the telephone line connected to the telephone, as shown in Figure 2–13.

Figure 2–13: Disconnecting the Telephone Line (Single- and Multi-Line Service)



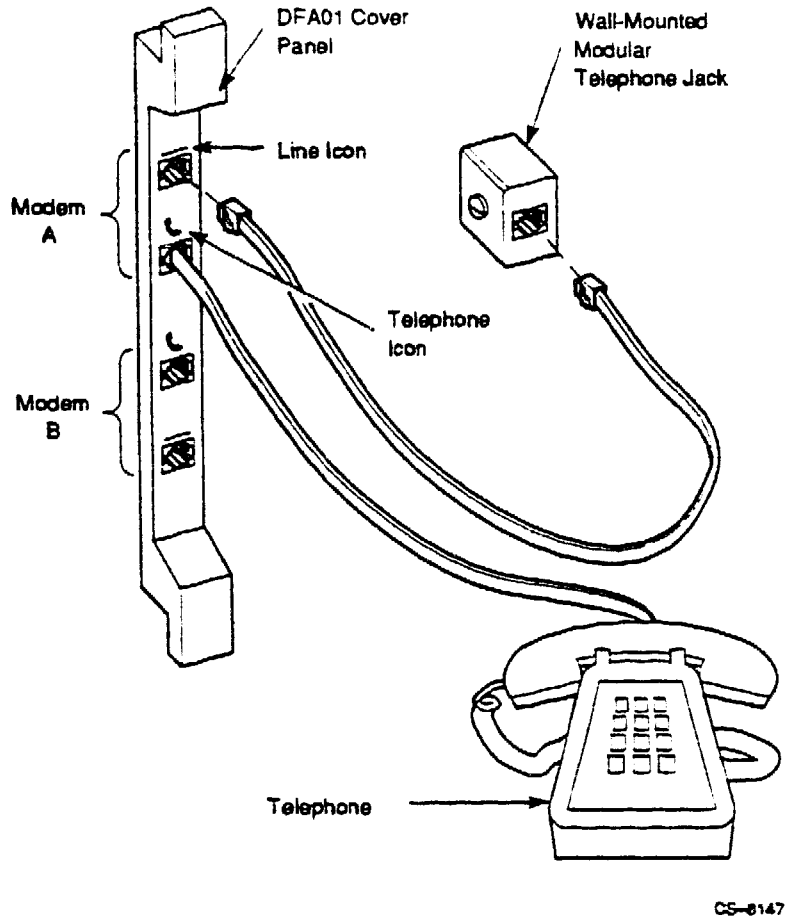
2. Take one end of one of the cords included with the DFA01 modem (17–00089–01) and insert it into the top jack on the DFA01 module cover (modem A). The top jack on the DFA01 module cover is marked with the line icon, as shown in Figure 2–14.

Figure 2–14: Installing Telephone Cord (Single- and Multi-Line Service)



3. Connect the other end of the cord to the wall-mounted telephone jack.
4. To install voice communication on modem A, take the end of the telephone line that you disconnected from the wall jack in step 1 and connect it to the second jack from the top of the DFA01 module cover, as shown in Figure 2–15. This jack is marked with the telephone icon.

Figure 2–15: Connecting Modem to Telephone (Single- and Multi-Line Service)



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

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

RJ41S/CA41A and RJ45S/CA45A Service

Use the following procedure to connect the modem to RJ41S/CA41A and RJ45S/CA45A data jack service. You will need a standard 8-wire telephone cord (not supplied with the DFA01 modem). If you have this service, you have two wall-mounted modular telephone jacks per telephone.

NOTE

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

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

1. Connect one end of an 8-wire telephone cord (not supplied with the DFA01 modem) into the top jack on the DFA01 module cover (modem A). The top jack on the module cover is marked with the line icon.
2. Connect the other end of the telephone cord into a second wall-mounted modular telephone jack, as shown in Figure 2–16.

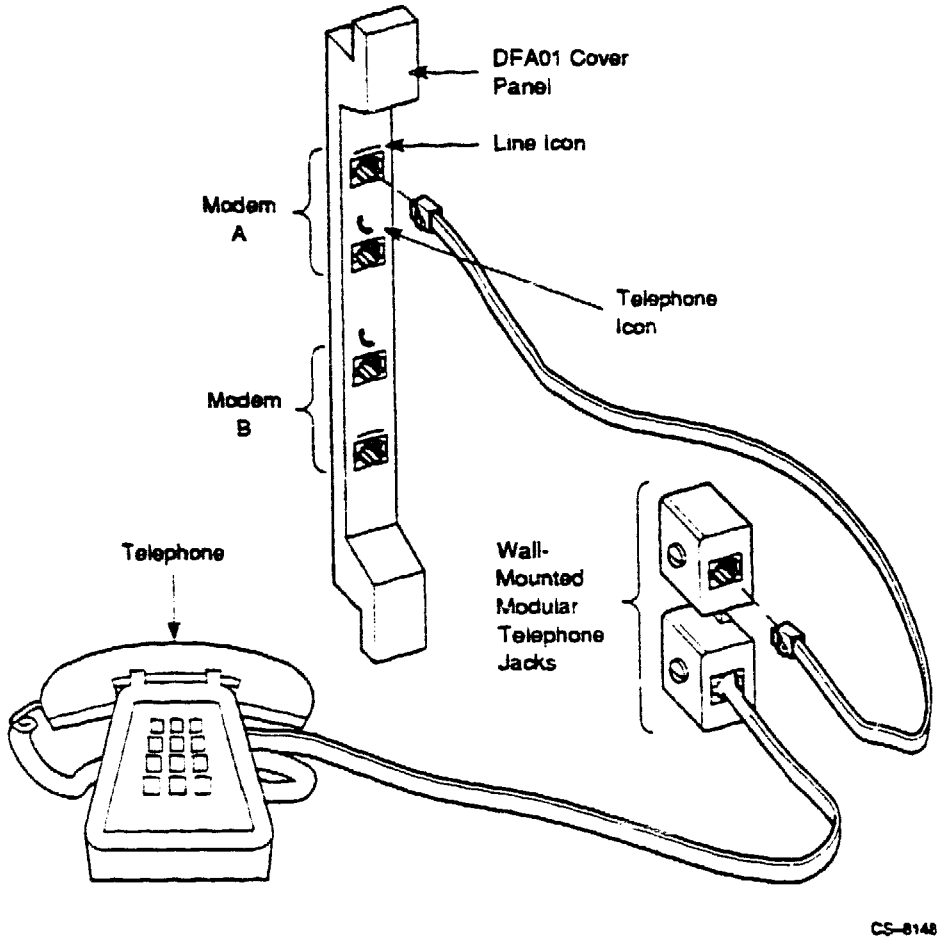
   If you require voice communication on modem A, refer to step 4 for more information.
3. If you do not plan to use modem B, skip this step and proceed to step 4. If you plan to use modem B, connect a second 8-wire telephone line to the bottom jack on the DFA01 module cover, marked with a line icon. (Notice that the jack positions are reversed for modem B.) Connect the other end of the cord to a wall-mounted modular telephone jack.

   If you require voice communication on modem B, refer to step 4 for more information.
4. If you require voice communication with the DFA01 modem, you may want to consider this step.

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

The first way of installing voice communication is established for both modem A and modem B in the preceding steps. The telephone is connected to the wall-mounted modular telephone jack which, in turn, is connected to the DFA01 module cover (see Figure 2–16).

Figure 2–16: Connecting Modem to Wall-Mounted Jack (Data Jack Service) — Telephone-to-Wall-Jack Connection



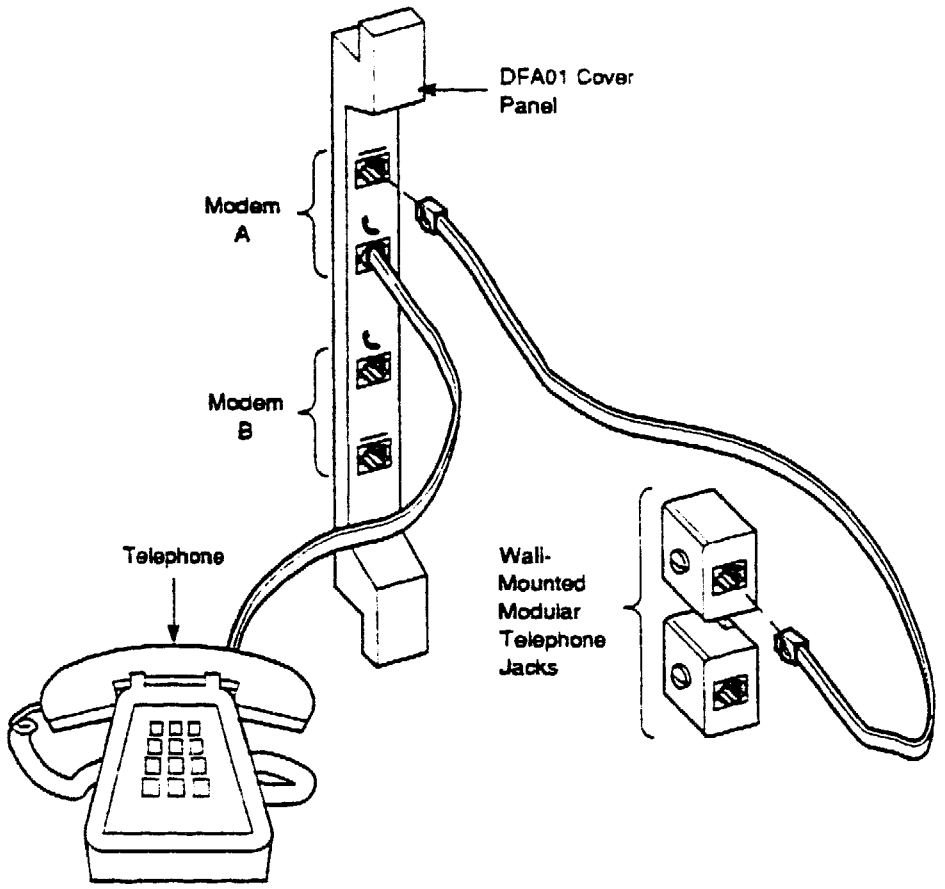
The following describes an alternative method of installing voice communication on the DFA01 modem. The telephone is connected to the DFA01 cover panel which, in turn, is connected to the wall-mounted modular telephone jack (see Figure 2–17).

a. Leave the 8-wire telephone cord connected that attaches the DFA01 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 DFA01 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.

Figure 2–17: Connecting Modem to Wall-Mounted Jack (Data Jack Service) — Telephone-to-DFA01 Connection



Setting Up Terminal Lines

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

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

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

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

You may need to define the following terminal line characteristics.

- Modem control—to support full EIA modem control.
- Speed, parity, data bits—terminal lines should be set to 2400 baud, parity disabled, and 8 data bits to coincide with the modem power-on 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 dialogue with the modem using terminal emulation software. With automatic hang up disabled, you can modify the DFA01 modem operating parameters (from applications software or when using a terminal emulator). You can then exit the program without the DFA01 modem resetting these parameters to power-on default values.

2.6.6 Connect to an Ethernet Network at the Console Bulkhead Assembly

The Rack-mountable VAX 4000 Model 300 console bulkhead assembly contains an Ethernet controller that can connect the system to a network using either standard or ThinWire Ethernet cabling.

The Ethernet connector switch activates either the standard or ThinWire connector. To select the standard Ethernet, slide the switch to the up position. To select ThinWire, slide the switch to the down position. The indicator light next to the selected connector should be lit when the system is powered on, indicating an active connection.

CAUTION

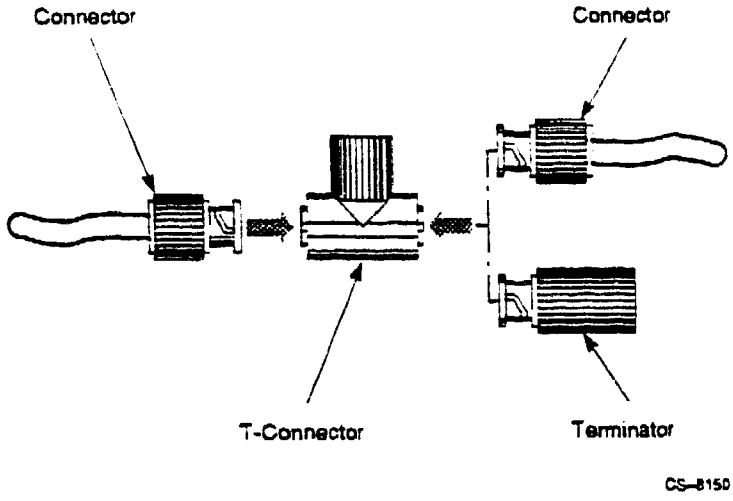
Turn the system off before you select a connector to avoid disrupting the network.

2.6.6.1 Make a ThinWire Network Connection at the Console Bulkhead Assembly

Make a ThinWire network connection at the console bulkhead assembly as follows:

1. Figure 2–18 shows a ThinWire cable, T-connector, and terminator. Remove the terminator from the bottom of the T-connector on the ThinWire connector on the console bulkhead assembly as shown in Figure 2–19.

Figure 2–18: ThinWire Cable, T-Connector, and Terminator



2. Connect the ThinWire Ethernet cable to the T-connector as shown in Figure 2–19.

   - If the system requires one connection to the network, connect the ThinWire cable to the lower end of the T-connector. Connect the cable to the T-connector by pushing in and turning the connector clockwise until it locks into place.
   - If the system is a link in a network and connects to two additional components, connect one ThinWire cable to one end of the T-connector. Remove the terminator from the other end and connect a second ThinWire cable to it. Connect the cables to the T-connector by pushing in and turning the connectors clockwise until they lock into place.

     Use the cable clamp to form the upper cable in a loop approximately 10 cm (4 in.) in diameter as shown in Figure 2–20.

Figure 2–19: Making a ThinWire Ethernet Connection at the Console Module

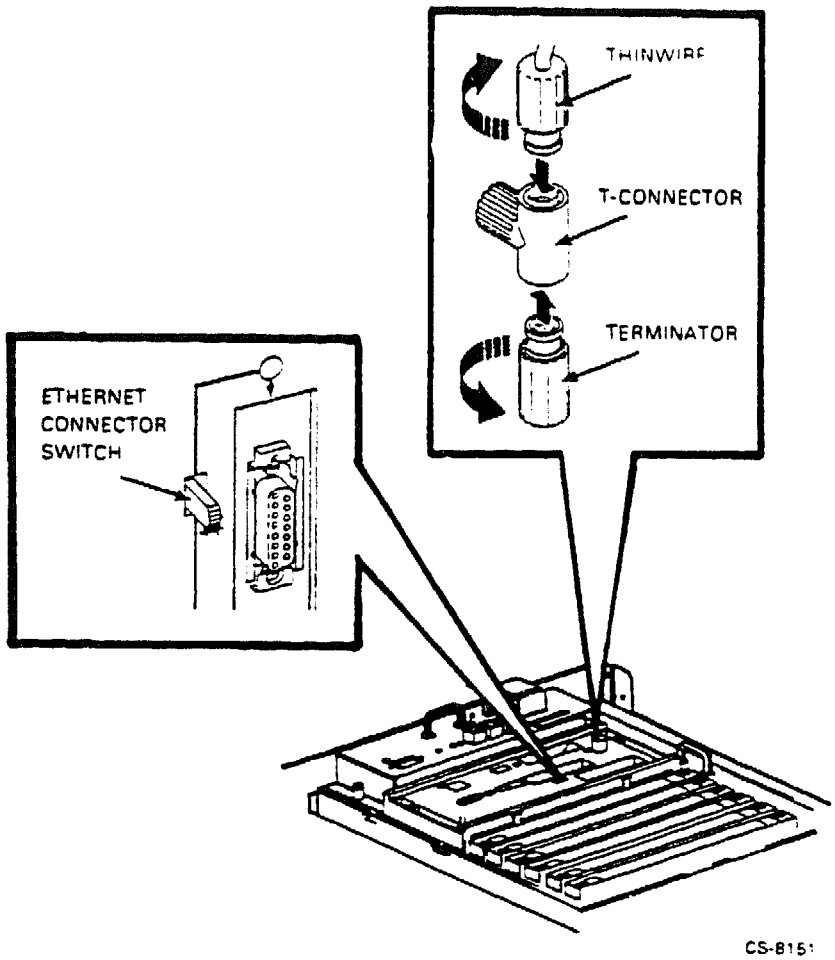
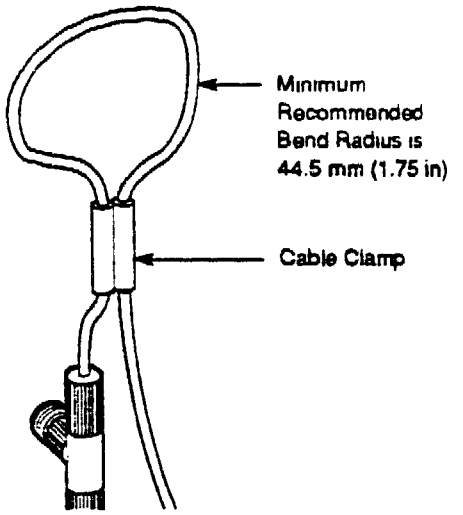


Figure 2–20: Form the Upper Cable in a Loop at the Console Module



3. The ThinWire cable can be connected to any one of the following devices:
   - A ThinWire Ethernet Multiport Repeater (DEMPR) which, in turn, can be connected to a baseband Ethernet cable, and can connect up to eight ThinWire segments in a local area network.
   - A ThinWire Ethernet Singleport Repeater (DESPR) which, in turn, can be connected to a baseband Ethernet cable, and connects to one ThinWire segment.
   - A ThinWire Ethernet adapter located in another VAX 4000, MicroVAX, or workstation.

The Digital Network and Communications publications explain the types of network configurations possible.

NOTE

Contact your network manager or Digital service representative if you have questions concerning 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 console bulkhead assembly.

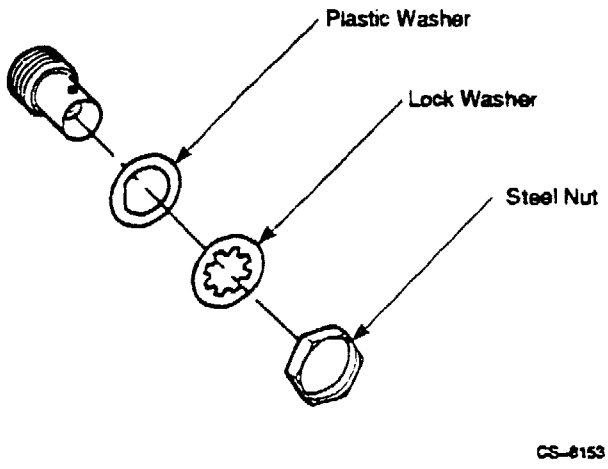
CAUTION

Each ThinWire Ethernet segment must have only one grounding point.

To ground a single-segment ThinWire network at the console bulkhead assembly, follow the instructions below.

1. Remove the steel nut, the lock washer, and the plastic washer on the console bulkhead assembly as shown in Figure 2–21.
2. Discard the plastic washer.
3. Replace and tighten the lock washer and the steel nut.

Figure 2–21: Grounding ThinWire Ethernet at the Console Bulkhead Assembly



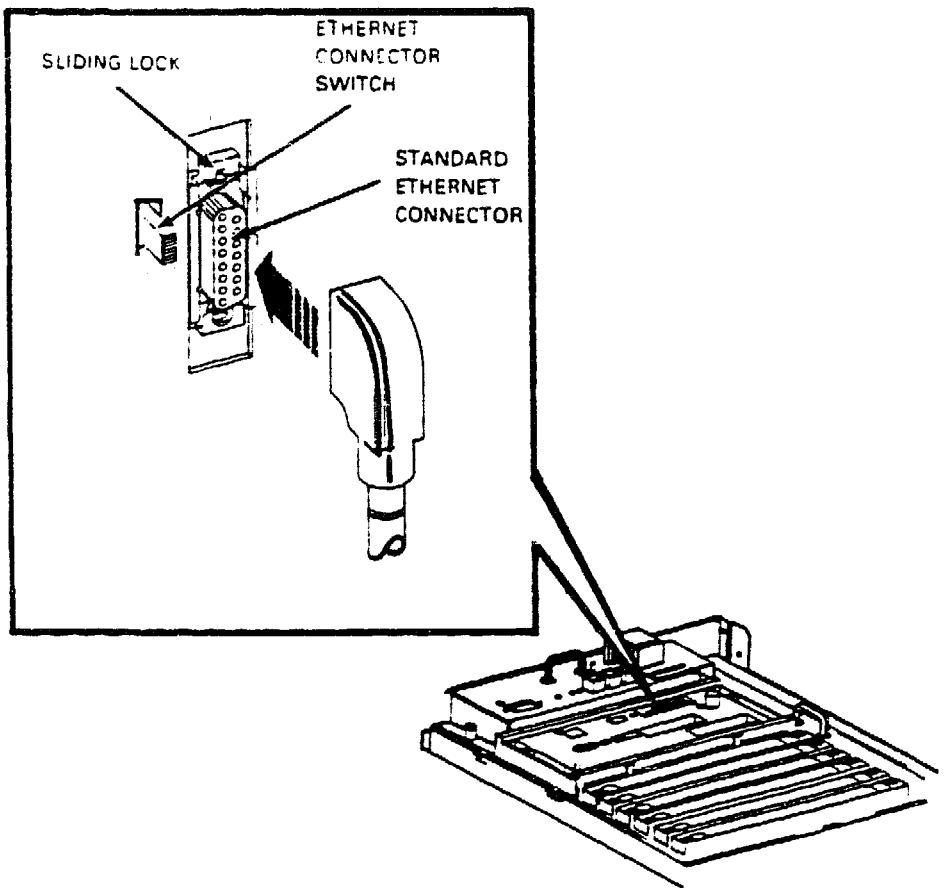
2.6.6.2 Make a Standard Network Connection at the Console Bulkhead Assembly

Make a standard network connection at the console bulkhead assembly as follows:

1. Find the Ethernet transceiver cable. The cable has a plug at one end and a socket at the other end.
2. Make sure the lock on the standard Ethernet connector on the console bulkhead assembly is in the up position. Feed the plug under the system and insert it into the socket on the console bulkhead assembly. Slide down the locking device on the socket to secure the connection. Figure 2–22 shows a standard Ethernet network connection.
3. Connect the other end of the cable to one of the following devices:
   - An H4000 or H4005 transceiver located on a traditional baseband Ethernet cable.
   - A DELNI which, in turn, can be connected to a baseband Ethernet cable, and can connect up to eight systems in a local area network.
   - A DESTA adapter, which allows you to connect the Ethernet transceiver cable to ThinWire Ethernet cabling.

The Digital Network and Communications publications explain the types of network configurations possible.

Figure 2–22: Making a Standard Ethernet Connection at the Console Module



2.6.7 Connect to an Ethernet Network at the DESQA Module

Your system may have a second Ethernet controller, the DESQA module. Two types of DESQA modules are available. They are exactly the same except one has an external Ethernet connector switch. Both modules can accommodate either ThinWire or standard Ethernet cabling. Figure 2–23 shows the location of the external Ethernet connector switch.

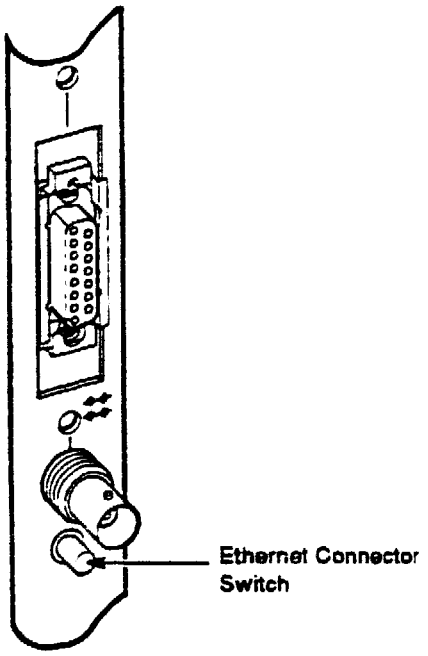
If your module does not have the connector switch, you can connect to the ThinWire Ethernet. To connect to the standard Ethernet port, you must call a Digital service representative.

CAUTION

Turn off the system before you select a connector to avoid disrupting the network.

You can use the external Ethernet connector switch to select either a ThinWire or a standard Ethernet connection. When the Ethernet connector switch is set to the out position, the ThinWire connector is selected. When the switch is set to the in position, the standard connector is selected. An indicator next to the connector lights when the system is powered on to indicate which port is selected.

Figure 2–23: DESQA ThinWire/Standard Ethernet Connector Switch



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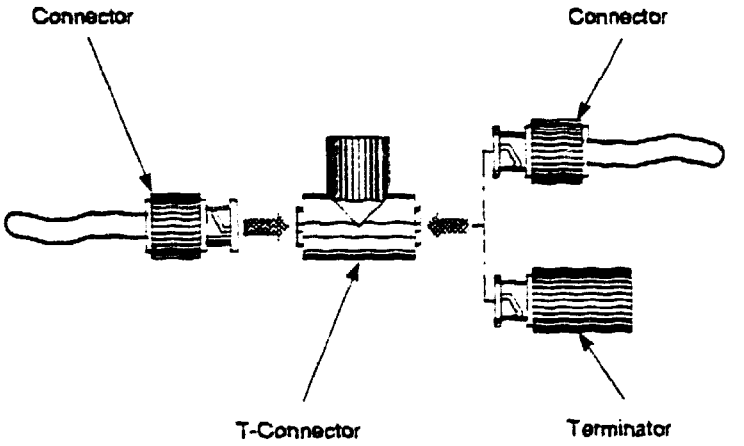
2.6.7.1 Make a ThinWire Network Connection at the DESQA Module

Make a ThinWire network connection at the DESQA module as follows:

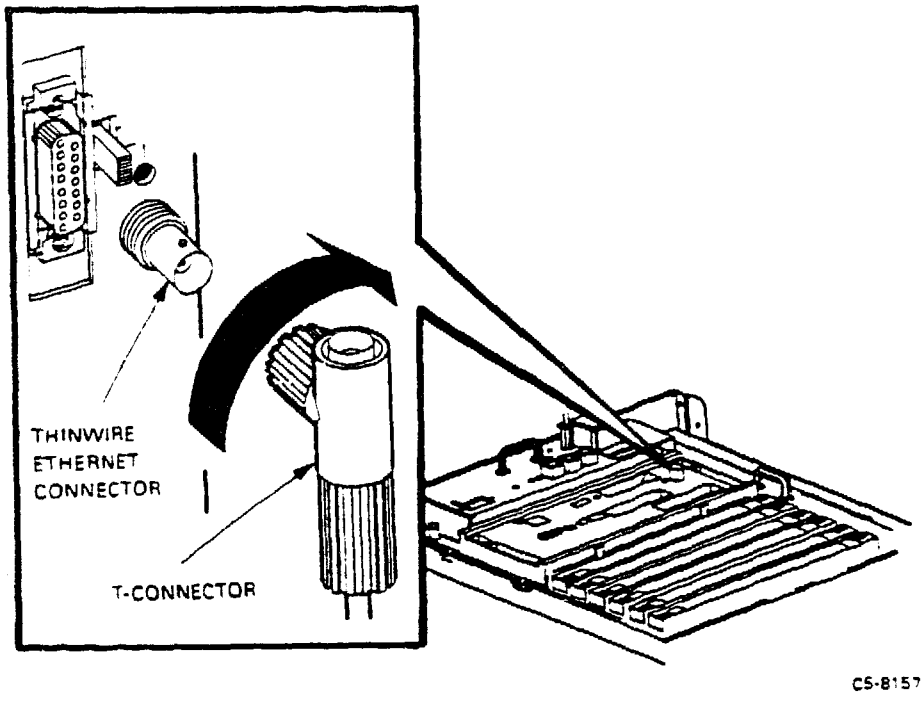
1. The T-connector and terminators are on the DESQA module. Push in and turn the T-connector plug counterclockwise until it unlocks. Figure 2–24 shows a ThinWire cable, T-connector, and terminator.

Figure 2–24: ThinWire Cable, T-Connector, and Terminator



2. Remove the terminators from either end of the T-connector.
3. Connect the ThinWire Ethernet cable to the T-connector as shown in Figure 2–25.
   - If the system requires one connection to the network, connect the ThinWire cable to the lower end of the T-connector and a terminator to the other end of the T-connector. Make connections to the T-connector by pushing in and turning the connector or terminator clockwise until it locks into place.
   - If the system is a link in a network and connects to two additional components, connect one ThinWire cable to one end of the T-connector and connect a second ThinWire cable to the other end. Connect the cables to the T-connector by pushing in and turning the connectors clockwise until they lock into place.

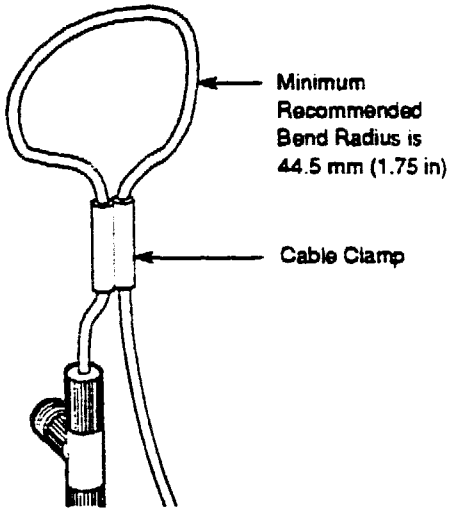
Figure 2–25: Making a ThinWire Ethernet Connection at the DESQA Module



4. The ThinWire cable can be connected to any one of the following devices:
   - A ThinWire Ethernet Multiport Repeater (DEMPR) which, in turn, can be connected to a baseband Ethernet cable, and can connect up to eight ThinWire segments in a local area network.
   - A ThinWire Ethernet Singleport Repeater (DESPR) which, in turn, can be connected to a baseband Ethernet cable, and connects to one ThinWire segment.
   - A ThinWire Ethernet adapter located in another VAX 4000, MicroVAX or workstation.
5. Insert the T-connector into the ThinWire connector on the DESQA module as shown in Figure 2–25. Push in and turn the T-connector plug clockwise until it locks.

6. Use a cable clamp to form the upper cable in a loop approximately 10 cm (4 in) in diameter, as shown in Figure 2–26.

Figure 2–26: Form the Upper Cable in a Loop at the DESQA Module



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The Digital Network and Communications publications explain the types of network configurations possible.

CAUTION

Each ThinWire Ethernet segment must have only one grounding point.

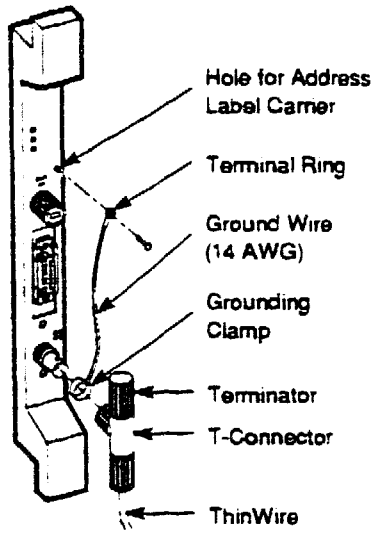
When the ThinWire cable is connected to a DEMPR or DESPR, the ground is provided by the DEMPR or DESPR chassis. If you are using a single-segment ThinWire Ethernet work area with no DEMPR or DESPR, you may need to ground the ThinWire connector on the DESQA Ethernet adapter.

NOTE

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

To ground a single-segment ThinWire network on the DESQA module, use a grounding clamp (P/N 90–08927–00) and an unshrouded T-connector (P/N 12–25534–01) as shown in Figure 2–27. Contact your Digital sales representative concerning these parts.

Figure 2–27: Grounding ThinWire Ethernet at the DESQA Module



2.6.7.2 Make a Standard Network Connection at the DESQA Module

Make a standard network connection at the DESQA module as follows:

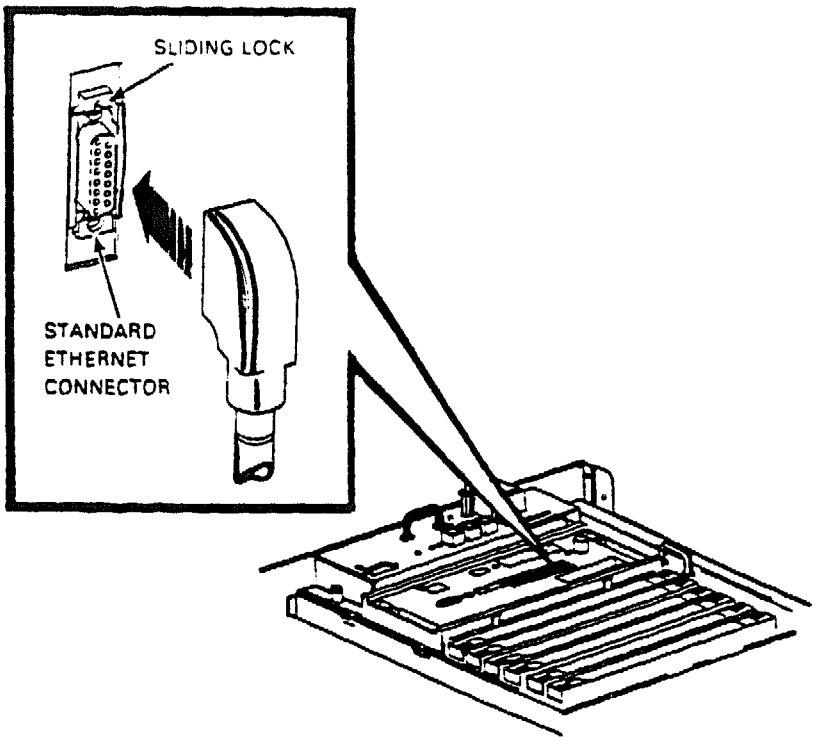
NOTE

The DESQA module without the Ethernet connector switch is configured at the factory for the ThinWire Ethernet. If you need to select the standard Ethernet port, call your Digital service representative.

1. Find the Ethernet transceiver cable. The cable has a plug at one end and a socket at the other end.
2. Feed the plug under the system and insert it into the socket on the DESQA module. Slide down the locking device on the socket to secure the connection. Figure 2–28 shows a standard Ethernet network connection.
3. Connect the other end of the cable to one of the following devices:
   - An H4000 transceiver located on a traditional baseband Ethernet cable.
   - A DELNI which, in turn, can be connected to a baseband Ethernet cable, and can connect up to eight systems in a local area network.

The Digital Network and Communications publications explain the types of network configurations possible.

Figure 2–28: Making a Standard Ethernet Connection at the DESQA Module



2.6.8 Install the R400X Expander

If you are installing an R400X expander with your VAX 4000 Model 300 system, do not proceed with the instructions in this manual. Begin installing your expander according to the installation instructions shipped with your expander. You will not need to return to this manual.

2.7 CABLING

2.7.1 Connect the DSSI Cables—Dual Host Only

A Digital Storage System Interconnect (DSSI) cable connects the storage devices in the VAX 4000 Model 300 dual-host system. The cable is labeled BC21M–09. It can be found with the cables that are shipped with the system.

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

1. Remove the DSSI terminator from host A, Bus 0. Bus 0 is to the left of the card cage as shown in Figure 2–29. Squeeze the spring clips at the top and bottom of the terminator as you pull it straight out of the bus as shown in Figure 2–29.

   Repeat this step for host B.

2. Find the 2.74-m (9-ft) DSSI cable labeled BC21M–09 that is shipped with the system.

3. Feed either end of the cable under host A from the back or side. Then insert the cable into the DSSI Bus 0 by fitting the cable connector over the two guide pins on the DSSI Bus 0 as shown in Figure 2–30.

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

4. Feed the opposite end of the cable under host B from the back or side. Then insert the cable into DSSI Bus 0 by fitting the cable connector over the two guide pins on DSSI Bus 0 as shown in Figure 2–30.

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

Figure 2–29: Removing the DSSI Terminators

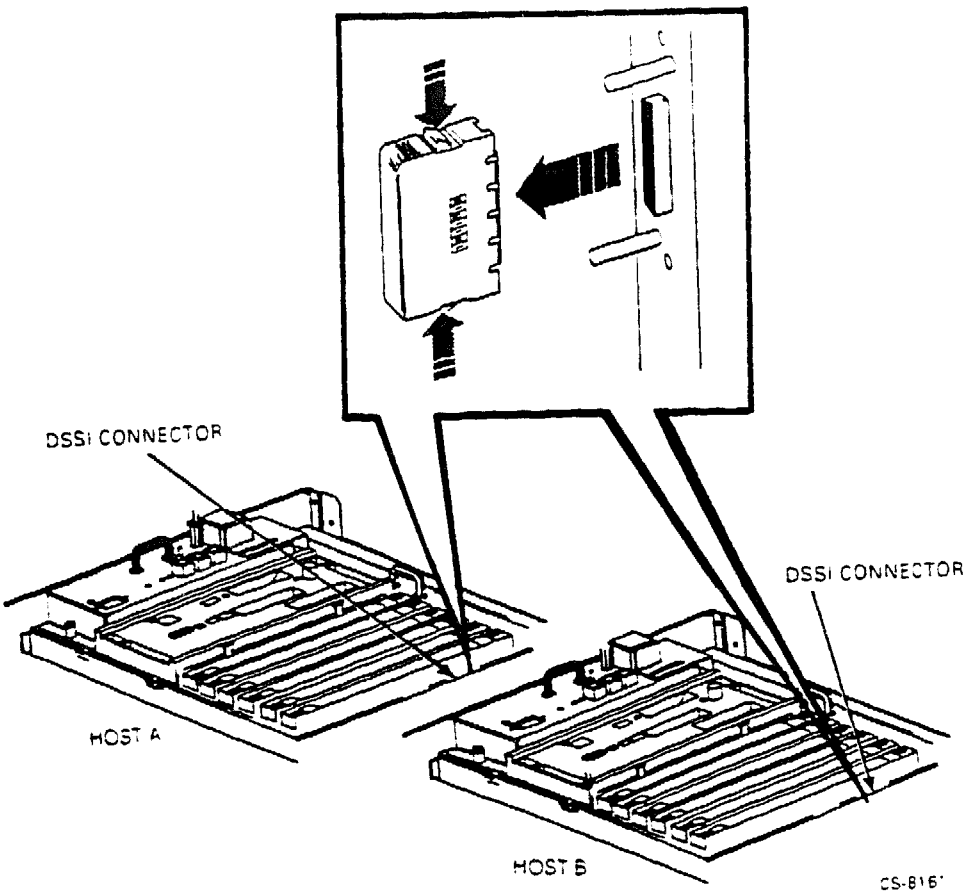
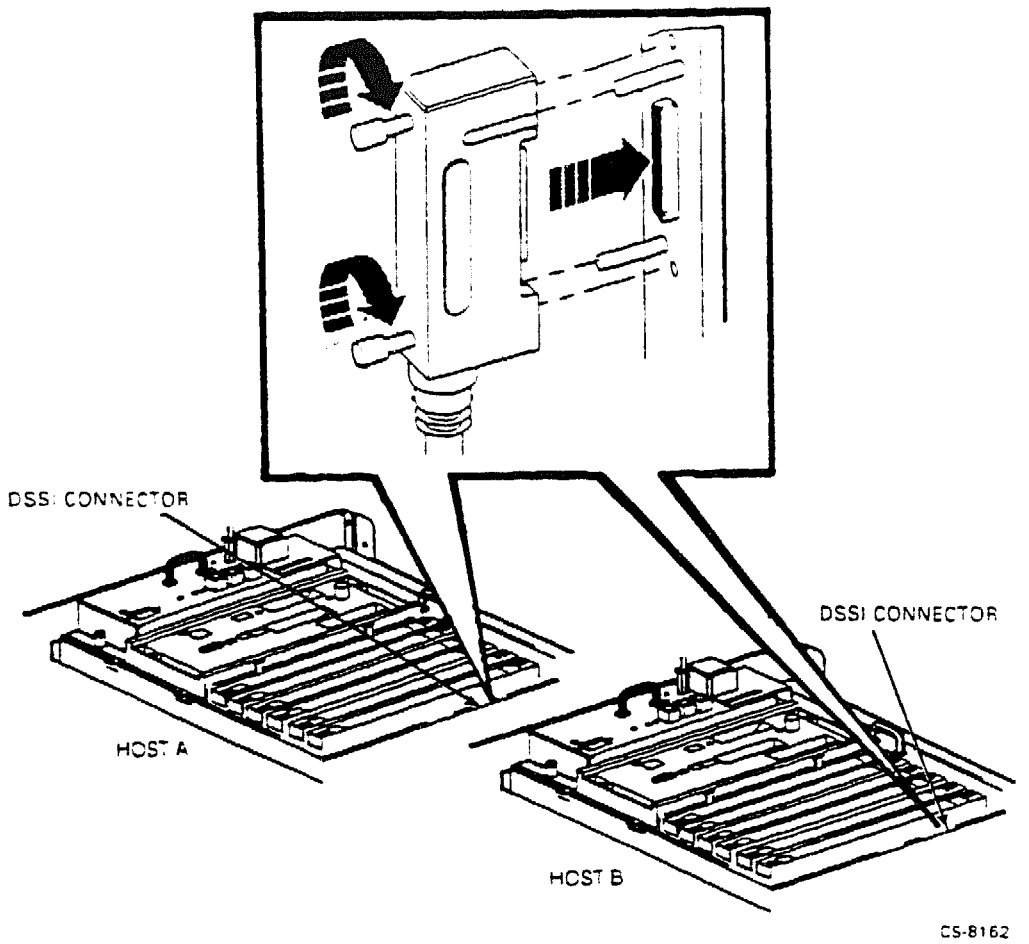


Figure 2–30: Connecting the DSSI Cable



NOTE

If you need to remove a DSSI cable, loosen the screws on the connector and then pull the connector straight out by pulling the two screw heads simultaneously.

2.7.2 Connect the System Power Cable

NOTE

This system contains an automatic voltage-select power supply. Voltage selection is not required prior to installation.

Connect the power cable to the system as follows:

1. Make sure the system ON/OFF switch (I/O) is set to OFF (O) as shown in Figure 2–31 and that all devices connected to the system are turned off.
2. Find the power cable shipped with the system.
3. Make sure the pronged end of the power cable plug matches the wall outlet. Several types are shown in Figure 2–32.

Figure 2–31: Setting the Power Switch to OFF

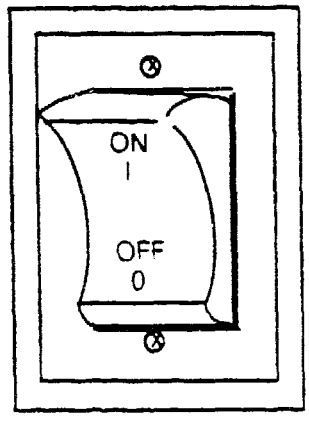


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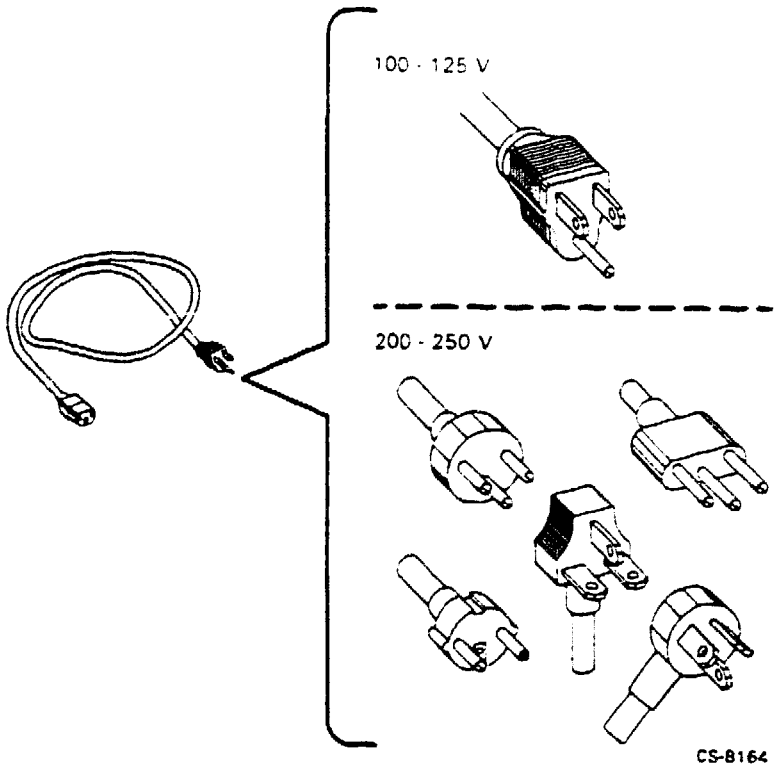
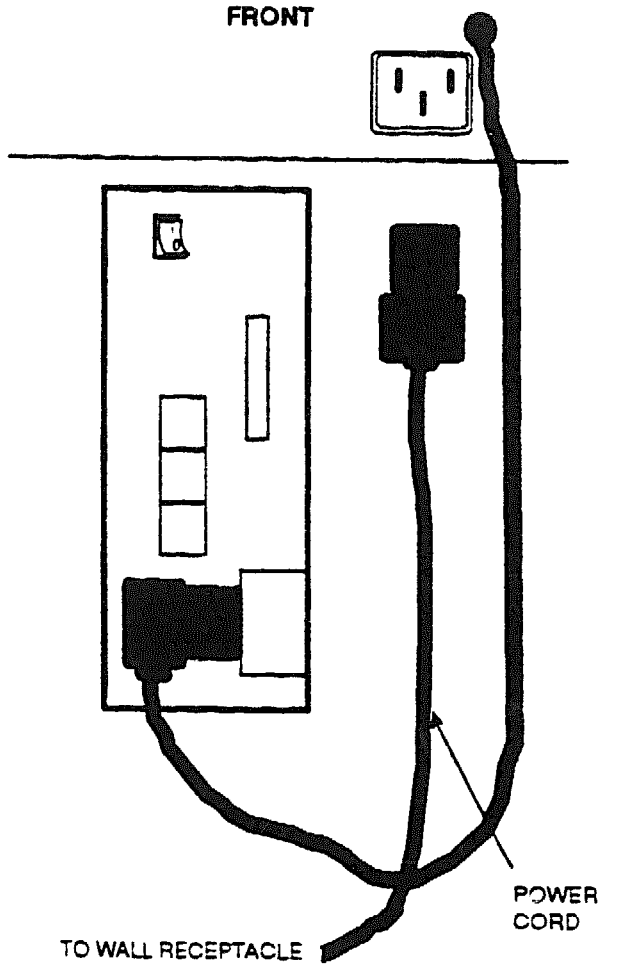
Figure 2–32: Power Cables



4. Feed the opposite end of the cable to the system from the rear and attach it to the power receptacle, as shown in Figure 2–33.
5. Insert the pronged end of the power cable into the wall outlet.

Figure 2–33: Attaching Power Cable to the System



2.8 COMPLETING INSTALLATION

This chapter describes the final procedures to complete the installation of the VAX 4000, Model 300 Computer System.

2.8.1 Turn on the System and Select a Language

You are now ready to turn on the system and select a language. The language you select controls only the language of the critical system messages in the console program, which is part of the firmware contained in the CPU. The CPU firmware enables you to give commands to the system, and also generates error messages. CPU firmware is described in the *VAX 4000 Model 300 Technical Information* manual.

Turn on the system(s) and select a language for each as follows:

NOTE

You must choose a language separately for each system in a dual-host system.

1. Turn on the console terminal and wait until it has performed its self-tests successfully.
2. Turn on the system by setting the power supply circuit breaker and the system ON/OFF switch to position ON (I). The AC Present indicator, located on the power supply, will glow orange.
3. Within a few moments, the Language Selection Menu is displayed on the console terminal, as shown in Figure 2–34.
4. Select a language by typing the number corresponding to your choice and pressing <key>(Return).

After you select a language, the system runs power-on self-tests. Within a few moments, the console terminal should display a series of numbers as the system tests itself. The example in Figure 2–35 shows the screen after a successful power-on test.

If the self-tests do not start or complete successfully, as shown in Figure 2–35, the system may have a problem. For instructions on finding the source of the problem, refer to the *VAX 4000 Troubleshooting and Diagnostics* manual.

Figure 2–34: Language Selection Menu

```
KA670-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):
```

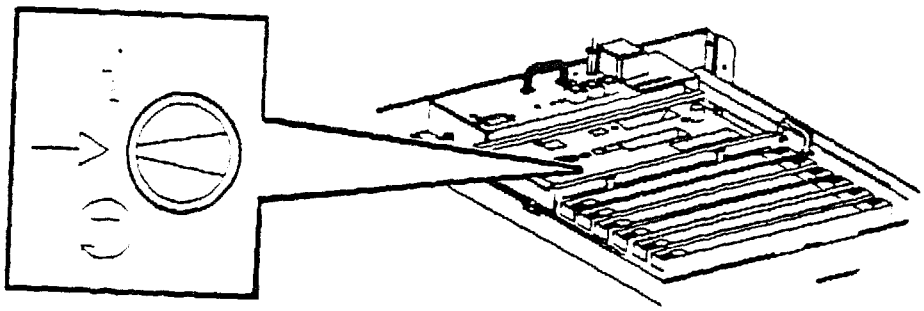
Figure 2–35: Successful Power-On

```
KA670-A Vn.n, VMB n.n

Performing normal system tests.
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.
>>>
```

The language is automatically saved each time you select it after powering on. If you want to save the language so you need not select it each time you power on, turn the Power-On Mode switch to Run mode, indicated by an arrow on the console bulkhead assembly, as shown in Figure 2–36.

Figure 2–36: Saving the Language



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2.8.2 After Installation

While optional, Digital strongly recommends that you run the diagnostic software before you install system software or start factory-installed VMS software for the first time. The diagnostics verify the system's configuration and check to see if each device is working properly. The diagnostic software is on a tape cartridge labeled MV DIAG CUST TK50. Chapter 3 of the *VAX 4000 Troubleshooting and Diagnostics* manual describes how to run the diagnostic software.

If you have VMS Factory-Installed Software (FIS) on your system, refer to Appendix A of the *VAX 4000, Model 300 Installation* manual for the startup procedure. Otherwise, install the system software that comes with your system.

NOTE

Systems that come with Factory-Installed Software (FIS) have a yellow sticker on the front panel of the ISE containing the FIS.

You should now read the *VAX 4000 Model 300 Operation* manual to learn how to use the system. You must know how to operate the system controls and the ISE before you install system software or run diagnostic software.

For more information on dual-host systems, refer to your *VAX 4000 Model 300 Operation* manual and to the *VAX 4000 Dual-Host Systems Manual*.


CHAP 3

Chapter 3
MAINTENANCE

3.1 TROUBLESHOOTING

Complete procedures for troubleshooting the Rack-mountable VAX 4000, Model 300 Computer System can be found by referring to *VAX 4000 Model 300 Installation.*

3.2 REMOVE/REPLACE PROCEDURES

WARNING

Whenever performing any removal or replacement procedure, ensure that the main ON/OFF power switch is OFF and that the power cord is disconnected from the wall receptacle.

This section describes the procedures for removing and replacing the Field Replaceable Units (FRUs) in the Rack-mountable VAX 4000, Model 300 Computer System. The FRUs and their part numbers that are unique to the Rack-mountable VAX 4000, Model 300 Computer System include:

- ON/OFF Switch Assembly (P/N 70-28603-02)
- Storage Backplane Assembly (P/N 70-28602-02)
- Power Card Assembly (P/N 70-28216-02)

- Fans (P/N 70-26702-01)
- Equipment Slides (P/N 12-34397-01)

3.2.1 ON/OFF Switch Assembly

WARNING

Whenever performing any removal or replacement procedure, ensure that the main ON/OFF power switch is OFF and that the power cord is disconnected from the wall receptacle.

Removal Procedure

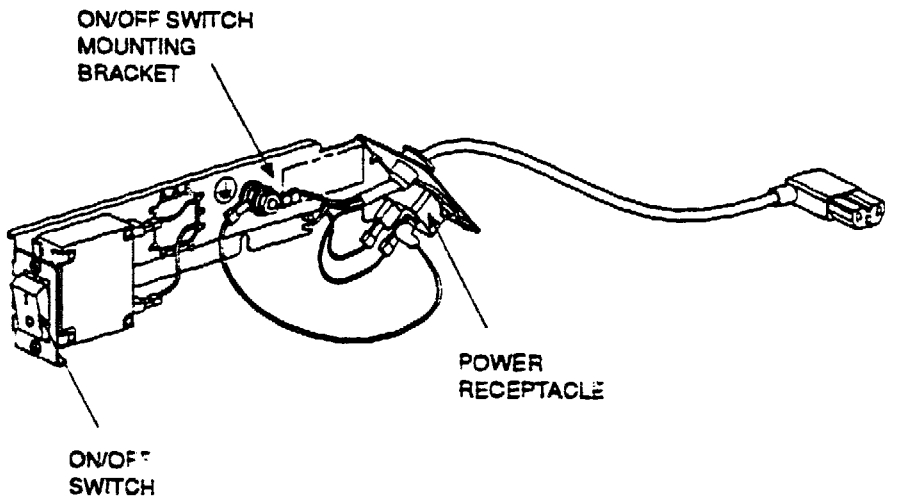
Perform the steps in the following procedure to remove the ON/OFF switch assembly (see Figure 3–1):

1. Release the two captive fasteners on each side of the bezel that secure the chassis to the cabinet rails.
2. Remove two 10-32 x 1/2 inch screws from the top of the chassis bezel.
3. Remove two 10-32 x 1/2 inch screws from the bottom of the chassis bezel.
4. Remove the bezel.
5. Remove the 12 6-32 x 3/8 inch screws securing the top cover to the chassis.
6. Remove the top cover.
7. Disconnect the plug from the power supply.
8. Using a hex socket wrench, remove two 6-32 hex nuts that secure the ON/OFF switch assembly to the chassis.
9. Remove the ON/OFF switch assembly from the chassis.

Replacement Procedure

To replace the ON/OFF switch assembly, reverse the previous steps.

Figure 3–1: ON/OFF Switch Assembly



3.2.2 Storage Backplane Assembly

Removal Procedures

Perform the steps in the following procedure to remove the storage backplane assembly from the chassis:

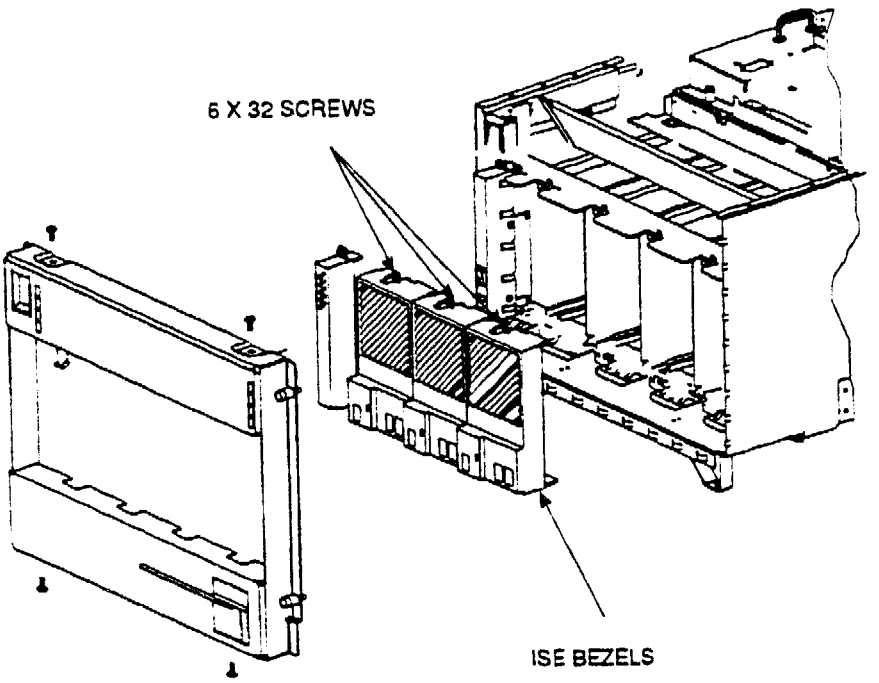
1. Release the two captive fasteners on each side of the chassis that secure the chassis to the cabinet rails.
2. Remove two 10-32 x 1/2 inch screws from the top of the chassis bezel.
3. Remove two 10-32 x 1/2 inch screws from the bottom of the chassis bezel.
4. Remove the bezel.
5. Loosen the captive 6-32 x 3/8 inch screw securing each of the Integrated Storage Equipment (ISE) bezels (some may be blank bezel covers).

NOTE

Be sure to note the bus identification number of each ISE before removing the cover. Each ISE device must be installed in its correct slot.

6. Remove the ISE bezels (see Figure 3–2).
7. Disconnect the cable from the bezel.
8. Loosen the two captive screws that secure the ISE device to the chassis.
9. Remove all ISE devices and set aside on a clear work surface.
10. If a TK70 tape drive is installed, slide the device part way out and reach in through the top of the chassis and remove the control cable by pressing the two connector locking tabs. Move the cable to the rear.
11. Slide the TK70 tape drive out and set aside on a clear work surface.

Figure 3–2: Removing the ISE Devices



CAUTION

When removing cables from the backplane assembly, label the various cables and connectors to ensure their correct replacement.

12. Remove the two DSSI and two SCSI cables from the storage backplane (see Figure 3–3).

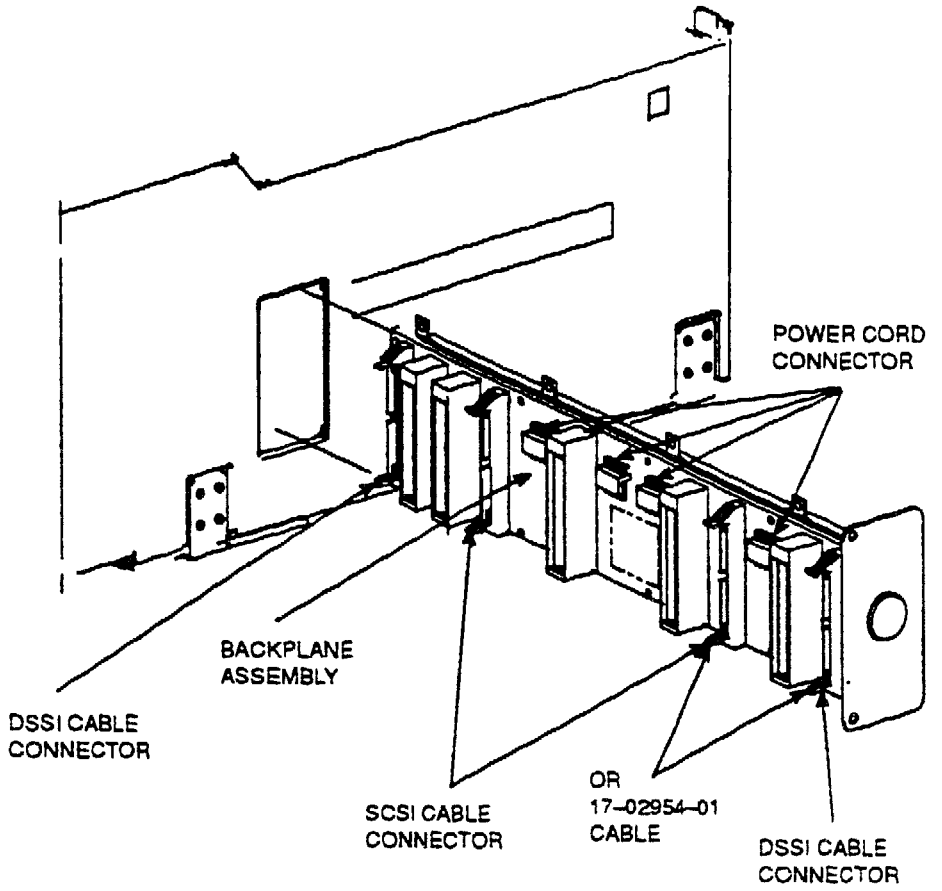
CAUTION

When removing the storage backplane assembly, be sure that the all connector extractors will not be interfering with the side of the chassis as the assembly is removed from the chassis.

13. Remove the two cables (P/N 17-02954-01) from the storage backplane (see Figure 3–3).

14. Unplug the four power cable connectors from the storage backplane (pull the connectors down and away from the storage backplane) (see Figure 3–3).

Figure 3–3: Storage Backplane Assembly Showing the DSSI, SCSI and Power Cable Connections



15. Remove the metal plug button from the side of the storage backplane assembly (see Figure 3–4).
16. Remove the two 6-32 x 3/8 inch screws from the storage backplane assembly cover panel (see Figure 3–4).
17. Slide the storage backplane assembly through the opening in the chassis to your right (see Figure 3–4).

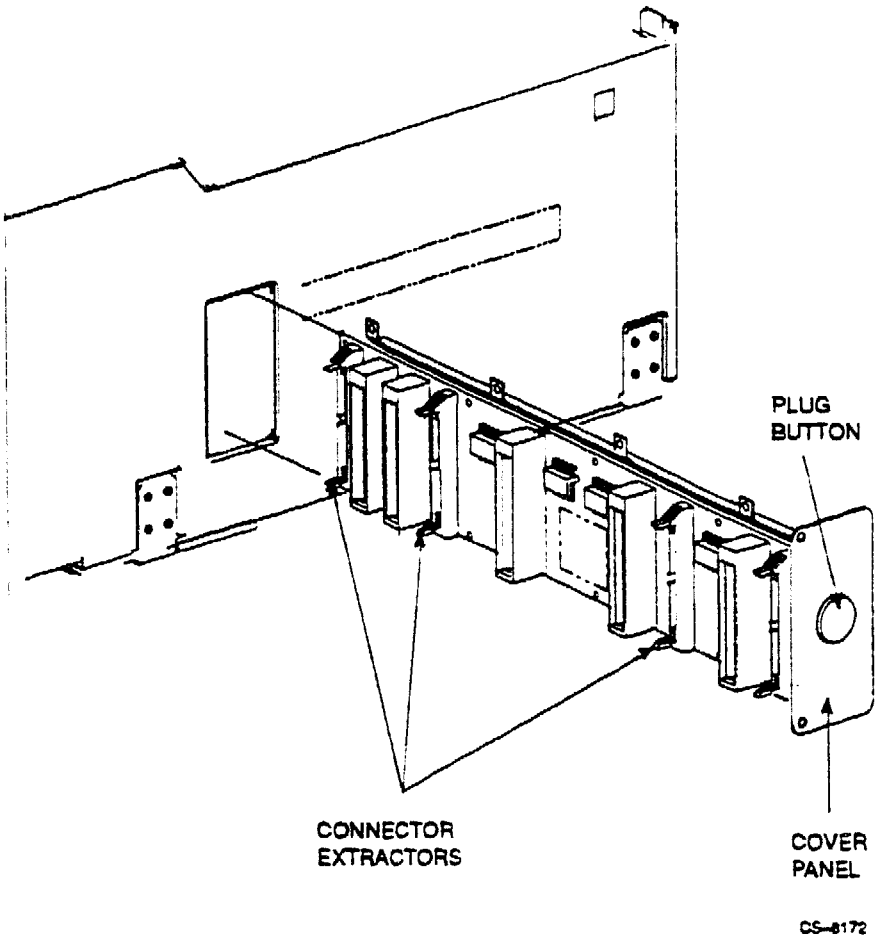
Replacement Procedure

To replace the storage backplane assembly, reverse the previous steps.

CAUTION

When installing the storage backplane assembly, be sure that the assembly is properly aligned to the rails. Also, ensure that all connector extractors are not interfering with the side of the chassis as the assembly is pushed in place.

Figure 3–4: Backplane Assembly



3.2.3 Power Card Assembly

Removal Procedure

Perform the steps in the following procedure to remove the power card assembly:

1. Release the two captive fasteners on each side of the bezel that secure the chassis to the cabinet rails.
2. Remove two 10-32 x 1/2 inch screws from the top of the chassis bezel.
3. Remove two 10-32 x 1/2 inch screws from the bottom of the chassis bezel.
4. Remove the bezel.
5. Loosen the captive 6-32 x 3/8 inch screw securing each of the appropriate Integrated Storage Equipment (ISE) bezel.
6. Remove the ISE bezel and cables.
7. Loosen the two captive screws that secure the ISE device to the chassis.
8. Remove the appropriate ISE device and set aside on a clear work surface.
9. Remove the power card connector from the storage backplane assembly (see Figure 3–5).
10. Remove the lower right hand device guide by lifting the front and then the rear of the slide up (see Figure 3–5).
11. Remove the device guide.
12. Reach into the ISE opening and grasp the power card assembly. Lift the power card straight up and remove (see Figure 3–5).

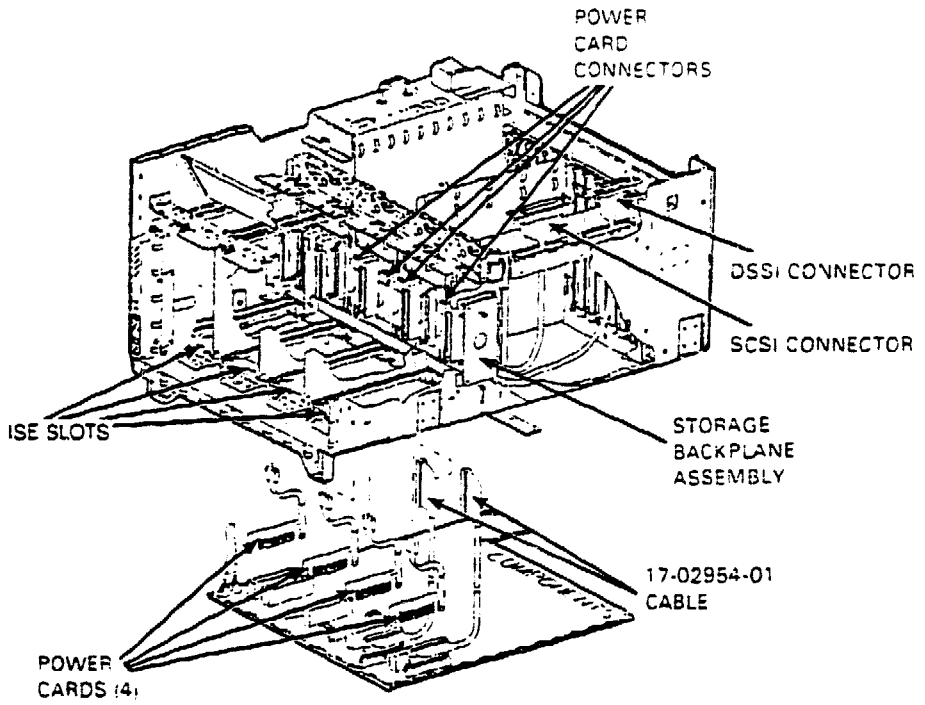
Replacement Procedure

To replace the power card assembly, reverse the previous steps.

NOTE

After installing the power card assembly in the connector, dress the cable so that it will be to the right of (behind) the lower right-hand device guide when the guide is installed.

Figure 3–5: Power Card Assembly



3.2.4 Fans

Removal Procedures

Perform the steps in the following procedure to remove a fan:

1. Pull the chassis all the way forward on the slides.
2. Remove the two 10-32 hex nuts from the bottom of each of the chassis mounting brackets (see Figure 3–6).

WARNING

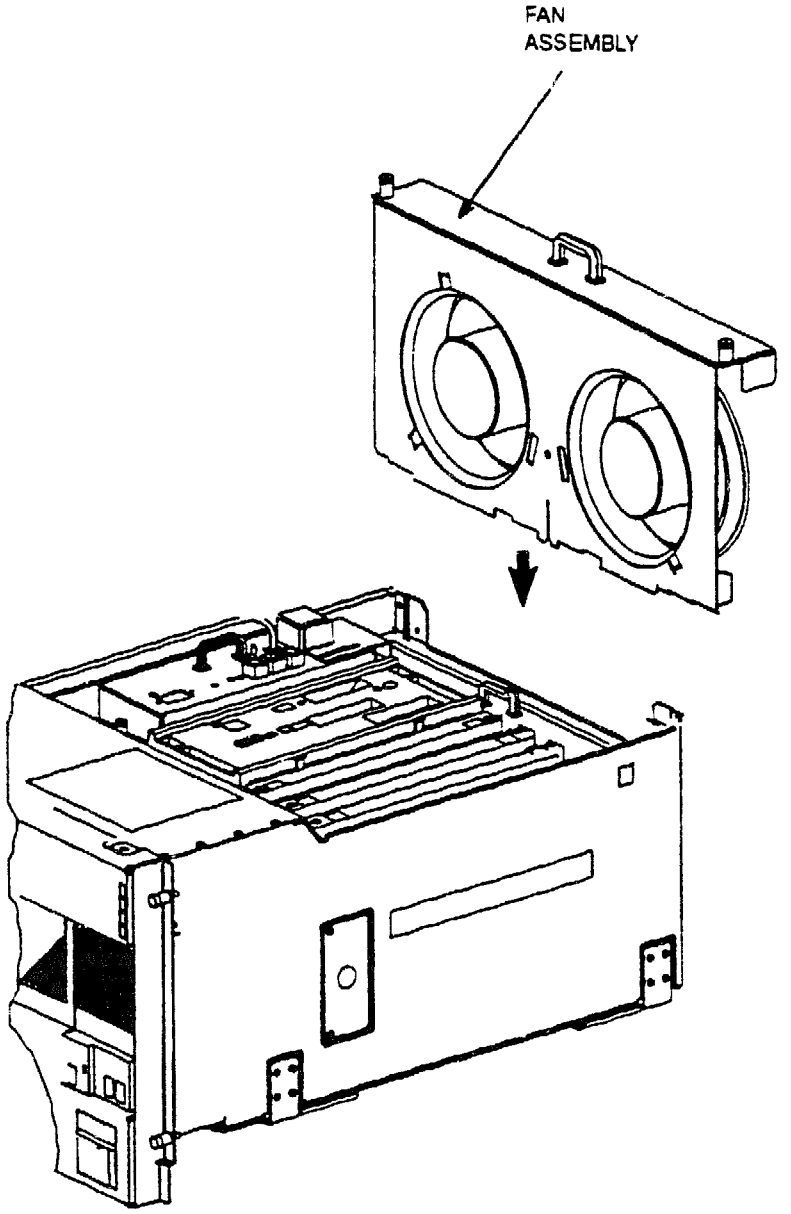
Use sufficient personnel and proper equipment when lifting or moving the Rack-mountable VAX 4000, Model 300 system. The fully loaded system weighs 53.5 kg (118 lb).

3. Lift the chassis straight up so that the eight 10-32 mounting studs are clear of the equipment slides.
4. Carefully lower the chassis onto a flat and clear work surface. Block the chassis, if necessary, to clear the mounting screws.
5. Release the two captive screws and then grasp the handle of the fan module, located at the rear of the chassis and pull upwards (see Figure 3–6).
6. Place the fan module on a work surface with the fans exposed (see Figure 3–6).
7. Remove the 6-32 hex nut securing the fan retaining bracket and remove the bracket (see Figure 3–6).
8. Disconnect the power cord connector of the defective fan (see Figure 3–6).
9. Remove the fan by sliding the fan to the side to clear the two metal retaining feet (see Figure 3–6).

Replacement Procedures

To replace the fan, reverse the previous steps.

Figure 3–6: Fan Assembly



3.2.5 Equipment Slides

Removal Procedure

Perform the steps in the following procedure to remove damaged equipment slides:

1. Pull the chassis all the way forward on the slides.
2. Remove the two 10-32 hex nuts from the bottom of each of the chassis mounting brackets (see Chapter 2, Figure 2–5).

WARNING

Use sufficient personnel when lifting or moving the Rack-mountable VAX 4000, Model 300 system. The fully loaded system weighs 53.5 kg (118 lb).

3. Lift the chassis straight up so that the eight 10-32 mounting studs are clear of the equipment slides.
4. Carefully lower the chassis onto a flat and clear work surface. Block the chassis, if necessary, to clear the mounting screws.
5. Remove the four 10-32 x 1/2 inch screws securing the equipment slide to the front and rear rails of the cabinet, and set aside.

Replacement Procedure

To replace a slide, follow the procedures in Chapter 2, Section 2.4.1.