

J282/2240 Owner's Guide



Workstation Systems Group

HP Part No. A2876-90015
Edition E1297
Printed in U.S.A.

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First Printing: December 1997

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Preface

This owner's guide describes how to use your HP 9000 J282/2240 workstation.

This manual assumes that you have installed your workstation as described in the *J Class Hardware Installation Guide*.

Audience

This guide is intended for HP 9000 J282/2240 workstation users.

**Safety and
Regulatory
Statements**

See Appendix A in the back of this manual for safety and regulatory statements that apply to this workstation.

**Release
Document(s)**

Please refer to the *Release Document(s)* you received with your system or system software for additional information that we may not have been able to include in this guide at the time of its publication.

If you are using HP-UX version 10.20, refer to the following manuals for more information:

- *J Class Hardware Installation Guide* (A2876–90010)
- *Using Your HP Workstation* (A2615–90003)
- *Installing and Updating HP-UX* (B2355–90050)
- *System Administration Tasks HP 9000 Series 700 Computers* (B2355–90051)
- *Configuring HP-UX for Peripherals* (B2355–90053)
- *HP Visual User Environment User's Guide* (B1171–90079)
- *Managing Clusters of HP 9000 Computers: Sharing the HP-UX File System* (B2355–90038)

To order manuals, please contact your local sales office.

Revision History

The revision history for each edition of the manual is listed below:

HP Part No.	Edition	Revision History
A4081–90601	E0195	First printing
A4081–90607	E0695	Second printing
A4476–90013	E0596	Third printing
A2876–90013	E1196	Fourth printing
A2876–90014	E0597	Fifth printing
A2876–90015	E1297	Latest printing

Documentation Conventions

Unless otherwise noted in the text, this guide uses the following symbolic conventions.

literal values Bold words or characters in formats and command descriptions represent commands or key words that you must use literally. Pathnames are also in bold.

user-supplied values Italic words or characters in formats and command descriptions represent values that you must supply.

sample user input In examples, information that the user enters appears in color.

output Information that the system displays appears in this typeface.



A colored rectangle with rounded corners and a key label denotes a key on your keyboard. (In this manual we refer to the **Enter** key. On your keyboard the key may be labeled either **Enter** or **Return**.)



This colored symbol with a label in it denotes an HP VUE screen button. A screen button is a key or button which is drawn on your workstation's graphic display by HP VUE. It works like a keyboard key, except that you must move the mouse cursor over it and press the left mouse button to activate it. The screen button's label describes its function.



This symbol indicates a notice.



This symbol indicates a procedure.



This symbol indicates a caution.



This symbol indicates the end of a chapter or a part of this guide.

**Questions,
Suggestions, or
Problems**

If you have any questions, suggestions, or problems with our hardware, software, or documentation, please call 1-800-633-3600 (US & Canada) or contact the HP Response Center for your country.



Chapter 1

System Overview

- Product description
- System unit front panel controls, LED, and LCD
- System unit rear panel connectors
- Monitors
- Keyboard and Mouse
- Pointing devices
- Operating system overview
- Important information you need to note
- Networking overview

This chapter introduces the HP 9000 J282/2240 workstations. Its purpose is to familiarize you with your workstation and its controls and indicators.

The instructions in this chapter assume you are using the HP-UX version 10.20 or later operating system with the HP VUE version 3.0 interface.

Product Description

This workstation has the following key features:

- Operating System HP-UX version 10.20 or later (J2240 requires HP-UX 10.20 ACE (Feb 1998) plus J2240 Hardware Extensions software)
- User Interface HP VUE version 3.0 graphical user interface or HP CDE
- Compatibility Source and binary code compatible with the Series 700 product family
- Monitors 20-inch 1280x1024 color monitor
- Optional Graphics HP VISUALIZE-EG, 8-plane 2D graphics
HP VISUALIZE-48XP, 48-plane graphics
HP VISUALIZE-8/24, Accelerated 8-plane or 24-plane 3D graphics
HP VISUALIZE-FX2 (J2240 only)
HP VISUALIZE-FX4 (J2240 only)
HP VISUALIZE-FX6 (J2240 only)
- Main Memory 32 MB to 2 GB (J282)
32 MB to 3.3 GB (J2240 only)
32 MB to 4 GB (J2240, running HP-UX 11.x only)

- Internal Storage Devices
 - Fast, Wide Differential SCSI (J282/upgrade J2240 only)
 - hard disk drives up to two:
 - 2 or 4 GB Drives
 - Ultra Wide–SE SCSI hard disk drives up to two (J2240 Only):
 - 4 or 9 GB Drives
 - Single-Ended SCSI removable Media – up to two:
 - CD-ROM Drive
 - 2.0–8.0 GB, 4-mm DDS tape drive
 - Floppy drive

- Standard Network
 - Ethernet IEEE 802.3 AUI Thicknet or RJ45, UTP Twisted Pair
 - 10 BaseT/100 BaseT (J2240 Only)

- Standard I/O
 - One Narrow Single-Ended SCSI:
 - 8-bit (for removable devices)
 - 5 MB/sec synchronous
 - 1.5 MB/sec asynchronous
 - ALT-1, 50-pin, high density SCSI-2 connector
 - One Fast, Wide Differential SCSI: (for hard disk drives, J282/upgrade J2240 only)
 - 20 MB/sec synchronous
 - 68-pin, high-density SCSI-3 P connector
 - One Ultra, Wide Single-Ended SCSI: (for hard disk drives, J2240 only)
 - 20 MB/sec synchronous
 - 68-pin, high-density SCSI-3 P connector
 - Two serial interfaces
 - RS-232C, 9-pin male

One parallel interface
Centronics, BUSY handshake
25-pin female

- EISA/GSC/PCI

Five slots total;

J282:

four EISA and three GSC that can be used as follows: two individual EISA, one individual GSC, and two combination EISA or GSC.

J2240:

one EISA (optional),
three 32-bit PCI, two 64-bit PCI,
and three GSC that can be used as follows: one 32-bit PCI,
one EISA or 32-bit PCI,
one GSC or 32-bit PCI and
two GSC or 64-bit PCI.

- Keyboard

PS/2 Keyboard

- Mouse

PS/2 Mouse

System Unit Front Panel Controls, LED, and LCD

Before powering on your system, you should become familiar with the system unit controls.

Figure 1-1 shows the the system unit front panel controls.

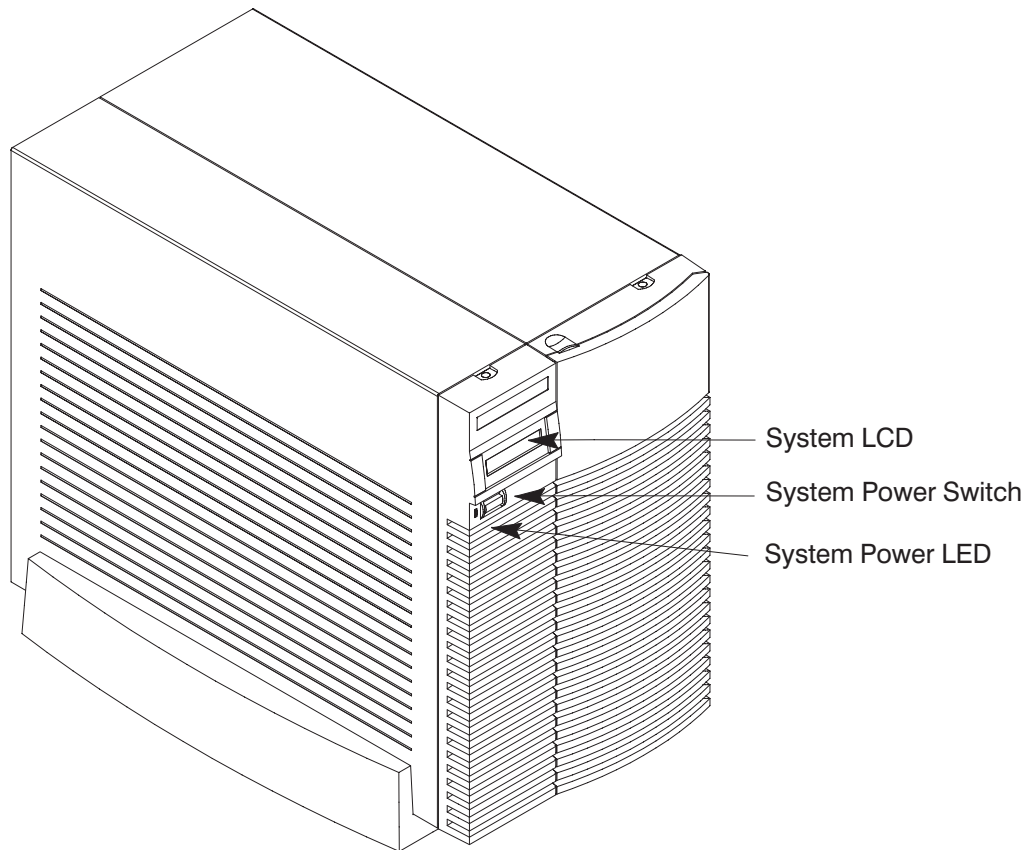


Figure 1-1. System Unit Front Panel Controls

System LCD

The Liquid Crystal Display (LCD) is located on the left side of the front panel. It displays messages about the state of the system, including error codes. The following symbols appear in the LCD, representing the different system activities shown:





	Operating system running
	Disk Access in progress
	Network Receive in progress
	Network Transmit in progress

Figure 1-2. LCD Symbols

System Power Switch

Use the Power switch to power the system unit on and off.



CAUTION: **Do not** turn off the power to your workstation without first performing the recommended shutdown procedure. If you do not shut down your workstation properly, you can damage the programs and data on your disk.

Using the proper shutdown method for your workstation and operating system also ensures that your system produces the proper diagnostic and self test messages, and broadcasts a warning message to remote terminals that it is about to shutdown.

Follow the instructions in *Using Your HP Workstation* to shut down your workstation.

System Power LED

The Power Light Emitting Diode (LED) is located on the left side of the front panel. It lights when the system unit power is on and flashes until the OS is booted. Once the OS is booted, the LED remains on without flashing.

Removable Device Buttons and LEDs

Depending on your configuration, you can have up to two (2) of the following removable device drives:

- CD-ROM disc drive
- DDS tape drive
- Floppy diskette drive



NOTICE: You **cannot** have two of the same type of device. For example, you can have a CD-ROM device and a floppy device, but not two CD-ROMs.

A description of each drive's controls and indicators is in the chapter describing that device, later in this book.

Figure 1–3 shows the system unit with the removable device door open. A removable device is in the top bay; a blank covers the empty bottom bay.

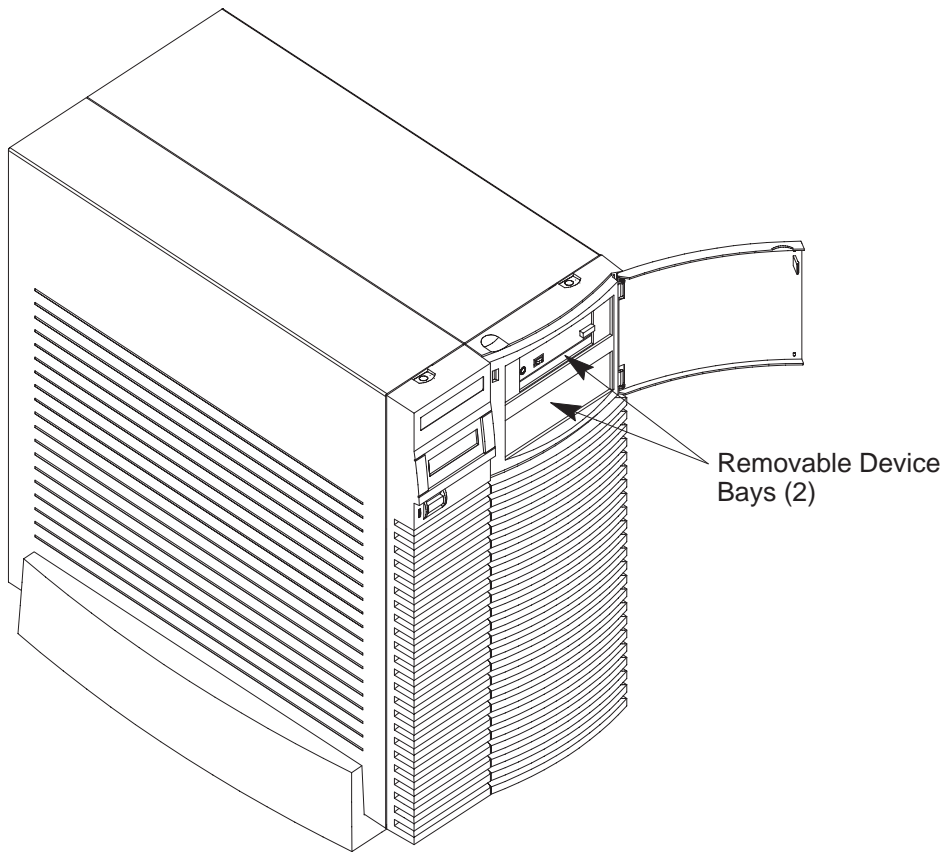


Figure 1-3. System Unit with Removable Device Door Open

System Unit Rear Panel Connectors

This section describes the following connectors on the system unit's rear panel:

- Audio connectors (including headphones and microphone)
- PS/2 keyboard and mouse connectors
- HP parallel Centronics I/O connector
- 802.3 AUI LAN connector
- 802.3 TP (Twisted Pair) LAN connector
- RS-232C serial I/O connectors
- SCSI connectors including fast, wide differential, or ultra, wide-SE (J2240 only) and narrow single-ended SCSI
- TOC button
- Power cord connector
- HP-HIL connector (J282 only)



NOTICE: To maintain FCC/EMI compliance, verify that all cables are fully seated and properly fastened.

Figure 1-4 shows the locations of the connectors on the system unit's rear panel.

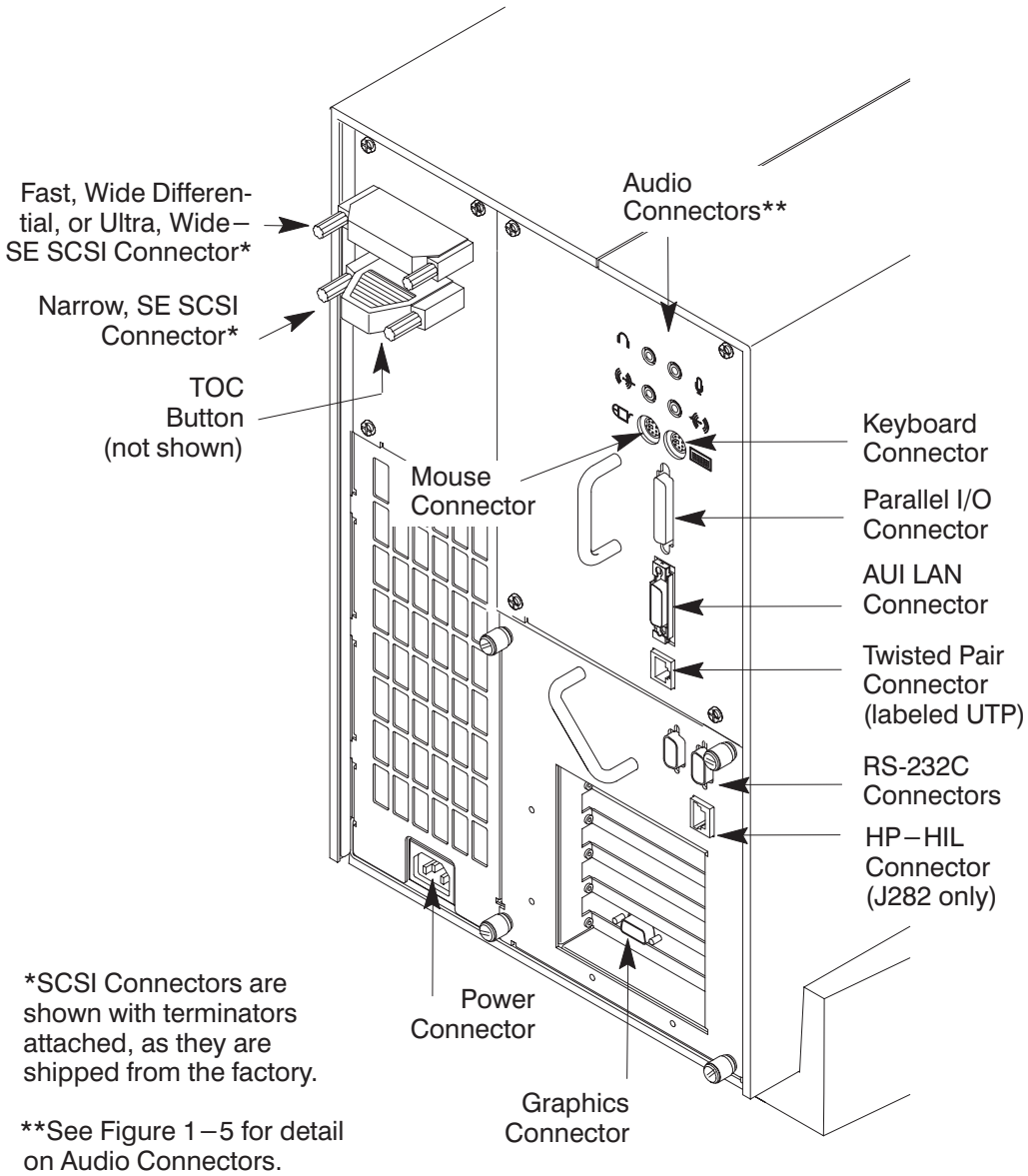


Figure 1-4. System Unit Rear Panel Connectors

The symbols shown to the left of the connector descriptions in the following text, such as the headphone and microphone for audio connectors, are the same symbols used on the rear panel of the J282/2240 workstation.



Audio Connectors

Your workstation has audio input and output capability through external input and output connectors on the rear panel and through an internal speaker. The rear panel contains the Audio IN (stereo line-in), Mic (microphone-in), Audio OUT (stereo line-out), and Headphones (headphones-out) connectors.

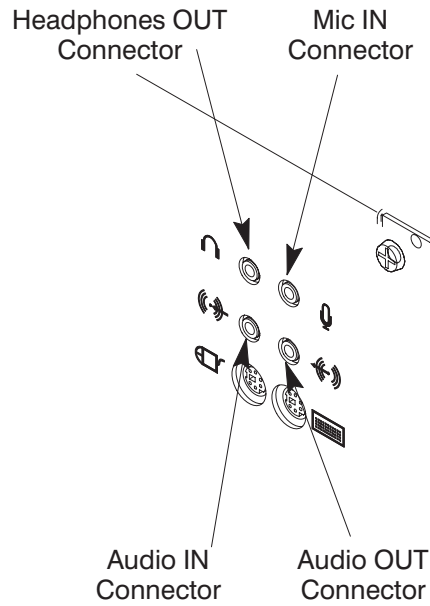


Figure 1-5. Audio Connectors

The audio connectors are standard stereo audio mini-jacks. Hewlett-Packard recommends using gold-plated plugs available through audio retailers for best quality recording and playback through the external connectors. A summary of the workstation audio features follows.

- Audio Features
 - Programmable sample rates:
8kHz, 16kHz, 32kHz, 48kHz, 11.025kHz,
22.05kHz, and 44.1kHz.
 - Programmable output attenuation:
0 to -96dB in -1.5dB steps
 - Programmable input gain:
0 to 22.5dB in 1.5dB steps
 - Input monitoring:
16-bit linear, 8-bit u-law, or A-law
coding
- Audio Inputs
 - Line-in
 - Mono microphone compatible with
1.5V phantom supply (bias voltage
supplied by the system)
 - CD-ROM audio (if internal CD-ROM is
installed)
- Audio Outputs
 - Line-out
 - Headphone
 - Mono speaker jacks
 - Built-in mono speaker
- Audio CODEC
 - Crystal CS4215

Table 1–1 summarizes the audio electrical specifications for this workstation.

Table 1–1. Audio Electrical Specifications

Frequency Response	25–20,000Hz	
Input Sensitivity/Impedance		
Line in	2.0Vpk/47kohm	
Microphone	22mVpk/1kohm	
Max Output Level/Impedance		
Line Out	2.8Vpp/47kohm	
Headphone	2.75Vpp/50ohm	
Speaker (internal)	5.88Vpp/48ohm	
Output Impedance		
Line Out	619ohm	
Headphone	118ohm	
Signal to Noise*		
Line Out	65dB	
Headphone	61dB	
Speaker	63dB	
Line In	61dB	
Microphone	57dB	
THD (w/nominal load)		
Line Out	–73dB	
Headphone	–70dB	
Speaker	–68dB	
Line In	–75dB	
Microphone	–73dB	≈

*To convert from dB to number of significant bits, use the formula:

$$n = \frac{dB}{20 \log_{10}} \approx \frac{dB}{6} . \quad \text{For example, for 61dB S/N then } n = 61/6 \approx 10$$

significant bits, or in other words, about 6 bits of noise.



Keyboard Connectors

PS/2 Keyboard Connectors

The PS/2 connectors provide an interface for the keyboard and mouse to the system. Consult the documentation that accompanies each input device for specific information concerning its use.



HP Parallel I/O Connector

The 25-pin HP Parallel I/O interface uses Centronics interface protocols to support peripheral devices such as printers and plotters. Consult the documentation that accompanies each peripheral device for specific information concerning its use.



802.3 Network Connectors

Your workstation has built-in ThickNet LAN AUI and TP (Twisted Pair) connectors for the 802.3 (ETHERNET) or 10 BaseT/100 BaseT (J2240 only) network. Connections to ThinLAN networks require an external transceiver. Your workstation will automatically select the correct network setting.

RS-232C Serial Input/Output Connector

You can attach a variety of pointing devices (such as a mouse or trackball), or peripheral devices to the RS-232C Serial Input/Output (SIO) ports on the J282/2240 workstation. Peripheral devices include printers, plotters, modems, and scanners. Consult the documentation that accompanies each pointing or peripheral device for specific information concerning its use.

The SIO ports are programmable. You can set functions such as bit rate, character length, parity, and stop bits. The SIO Ports are used as an interface for serial asynchronous devices to the CPU. The ports operate at up to a 19.2 K baud rate.

Table 1–2 shows the SIO connector pin listings. The serial connectors are 9-pin D-sub connectors. Signal names are those specified in the EIA RS-232 standard.

Table 1-2. Serial I/O Pins

Pin No.	Signal	Description
1	DCD	Data Carrier Detect
2	RXD	Receive Data
3	TXD	Transmit Data
4	DTR	Data Terminal Ready
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicator



SCSI Connectors

Use the SCSI connectors to connect external SCSI devices such as DDS-format tape drives and CD-ROM drives. Consult the documentation that accompanies each SCSI device for specific information concerning its use. Refer to Appendix C for information about connecting SCSI devices to your workstation.



NOTICE: When attaching external SCSI devices, be sure to terminate the last device on the external SCSI bus.

Power Cord Connector

Plug the workstation's power cord into the power cord connector to provide ac power to the system.

Monitors

You can use one of the following HP monitors with your workstation:

- 20-inch, 1280x1024 color monitor (A4033A)
- 20-inch, 1280x1024 color monitor (A4331A)
- 21-inch, 1600x1200 color monitor (A4576A)

Before using your monitor, you should become familiar with its controls, connectors, and indicators. For information on these controls and indicators and on using your monitor, see the documentation that came with it.

Pointing Devices

You can use an HP three-button mouse (PS/2), a trackball, or other options as pointing devices with your workstation by using the serial ports. For instructions on using your particular pointing device, see the manual that came with it.

For general information on using three-button mice and on the various cursor shapes associated with different areas of HP VUE while using a mouse, see *Using Your HP Workstation*.

Operating System Overview

Your workstation uses the HP-UX operating system, 10.20 or later (HP-UX 10.20 ACE (Feb 1998) plus J2240 Hardware Extensions software for J2240). Instant Ignition systems, (systems with preloaded software), have X-windows and Hewlett-Packard's graphical user interface, HP VUE version 3.0, or HP CDE installed and configured.

Please refer to the "Instant Ignition System Configuration Information" sheet that shipped with your system for details on configuration.

If your Instant Ignition system does not have the kernel preconfigured with all of the device drivers you need, refer to the manual *System Administration Tasks HP 9000 Series 700 Computers* to reconfigure your kernel.

If you have any questions about Instant Ignition, refer to *Using Your HP Workstation* for more information.

Important Information You Need to Note

Before you begin using your workstation, take a moment to gather the following important information and note it in the appropriate subsection for future use:

- LANIC ID
- Internet Protocol (IP) address
- Subnetwork mask



NOTICE: For help with these, refer to *Using your HP Workstation*.

LANIC ID

Locate the contents label that comes with the workstation shipping carton. Find the LANIC ID listed there and record it here:

LANIC ID _____

You can also get your LANIC ID by using the the **lanscan** command in a terminal window.

IP Address and Subnetwork Mask Information

Get the IP address and the subnet mask information for your workstation from either your system administrator or your network administrator and note them here:

IP address _____

subnet mask _____

Networking Overview

Your workstation is capable of many more tasks than are described in this owner's guide. This section gives an overview of some of the networking capabilities of your system and directs you to the appropriate source for more information.

Mail

Electronic mail allows you to send and receive mail messages on your workstation. For information on setting up and using electronic mail on your workstation, contact your system administrator and also see the *Using Your HP Workstation* manual that came with your workstation.

telnet

The **telnet** application uses the TELNET protocol to communicate with another computer system on the network. The **telnet** application allows you to log on to the remote system from your workstation. For more information on **telnet** read the online man page by entering the following at a command-line prompt:

```
man telnet 
```

rlogin

The **rlogin** application also allows you to log on to another computer system on the network from your workstation. For more information on **rlogin** see the *Using Your HP Workstation* manual that came with your workstation and read the online man page by entering the following at a command-line prompt:

```
man rlogin 
```

ftp

The **ftp** application is a user interface to the File Transfer Protocol. Use **ftp** to copy files between your workstation and another computer system on the network. For more information see the *Using Your HP Workstation* manual that came with your workstation and read the online man page by entering the following at a command-line prompt:

```
man ftp 
```

rcp

The **rcp** application allows you to remotely copy files from another computer system on a network to your workstation. For more information see the *Using Your HP Workstation* manual that came with your workstation and read the online man page by entering the following at a command-line prompt:

```
man rcp 
```

NFS

The Network File System (NFS) allows your workstation to access files on remote computer systems as if they were on your local system. The file system on the remote computer system does not have to be compatible with your workstation's file system. For more information see *Installing and Administering NFS Servers* and *HP-UX System Administration Tasks* manuals.



Chapter 2

Using Your CD-ROM Drive

- CD-ROM drive and media descriptions
- Loading and unloading a CD-ROM disc
- Verifying the CD-ROM drive operation
- Using device files
- Mounting and unmounting a CD-ROM disc
- Reading the busy light
- Troubleshooting

This chapter provides an overview of the optional CD-ROM drive and media, and describes how to use the CD-ROM drive. We assume the CD-ROM drive is set to the factory default address of SCSI ID 2.

The instructions in this chapter assume you are using the HP-UX version 10.20 or later operating system with the HP VUE version 3.0 interface.



NOTICE: Be sure you have read and understand the information on mounting and unmounting CD-ROM discs before you begin using your CD-ROM disc drive.



NOTICE: Some procedures in this chapter require you to log in as **root**. If you cannot log in as **root**, contact your system administrator.

CD-ROM Drive and CD-ROM Media Descriptions

This section describes basic information needed for using the CD-ROM drive and CD-ROM discs.

CD-ROM Drive

The CD-ROM drive is a random access read-only mass storage device that uses removable CD-ROM discs. The drive supports the ISO 9660 and High Sierra format standards. You can access information from the drive like any other disk drive, except that you cannot write to the drive. The drive contains a semiconductor laser for reading data optically, and includes an embedded controller with a SCSI interface.

Controls and Features

Figure 2-1 and Table 2-1 describe the operating controls and features of the CD-ROM drive.

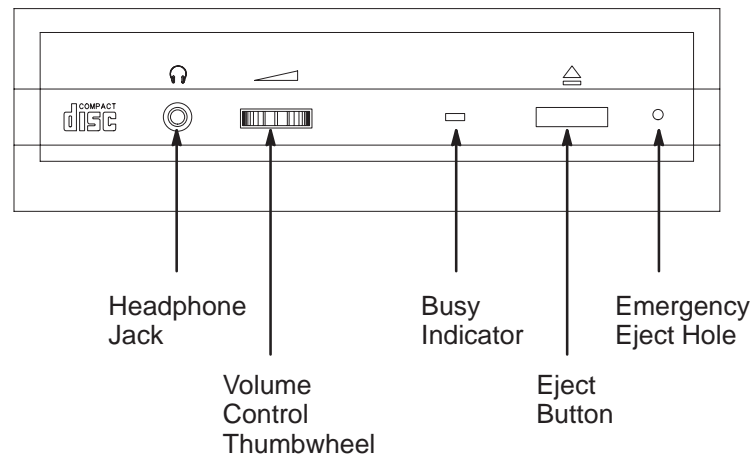


Figure 2-1. CD-ROM Drive Controls and Features

Table 2–1. CD-ROM Drive Operating Controls and Features

Control/Feature	Purpose
Headphone Jack	You can plug mini-headphones with a 3.5 mm diameter miniature stereo plug into this jack.
Volume Control	Use the volume control to adjust the audio output volume to the headphone jack.
Busy Indicator	<p>The Busy Indicator lights during a data access operation and blinks during a data transfer. The indicator blinks initially and then stays lit when there is one of the following:</p> <ul style="list-style-type: none"> • A defective disc • A disc insertion error (for example, an upside-down disc) • No disc present
Eject Button	Press the Eject Button to open the Disc Tray and insert or remove a disc. When the drive is in use, you must press the eject button for more than one second to open the Disc Tray.
Emergency Eject	By inserting the end of a paper clip, you can open the Disc Tray when the workstation does not have power.
Disc Tray	The disc tray holds the CD-ROM disc. This style of CD-ROM drive does not use a disc caddy. The disc tray does not open if the workstation power is off.
<p>NOTICE: The Volume Control, Headphone Jack, and Audio Jack features of the CD-ROM drive are supported through applications only.</p>	

CD-ROM discs are identical to audio compact discs (CDs), except that they store computer data.



CD-ROM Media

CD-ROM discs are 120 mm (4.7 in.) in diameter, and use one data surface with a capacity of 600 megabytes. The data surface contains pits and flat spots arranged in a continuous spiral track, which is read at a constant speed. You may access files and data stored on a CD-ROM disc, but you may not write files or data to a CD-ROM disc.

CAUTION: Handle CD-ROM discs by the edges only. Always be sure a CD-ROM disc is either in the CD-ROM drive or its protective case when not in use. This will lessen the chance of exposing the disc surface to dust. Over time, dust reduces the reliability of the read head in the CD-ROM drive.

Caring for CD-ROM Discs

Observe the following guidelines to help prevent data loss and prolong the life of your CD-ROM discs and drive:

- Use CD-ROM discs in a clean environment to prevent dust particles from scratching disc surfaces.
- Store CD-ROM discs in a cool, dry place to prevent moisture and heat damage.
- Don't try to clean the surface of a CD-ROM disc with cleaning solvents, as some cleaning solvents may damage the disc.



NOTICE: You must mount the disc after loading it into the drive. Refer to the section "Mounting and Unmounting a CD-ROM Disc," later in this chapter, for instructions.

Operating the CD-ROM Drive

This section describes how to perform tasks with your CD-ROM drive.

Loading and Unloading a CD-ROM Disc

This section describes how to load or unload a CD-ROM disc.

Loading a CD-ROM Disc

This CD-ROM drive has an automatic loading/ejecting feature. To load a disc in the CD-ROM drive, follow these steps:



1. Press and release the eject button on the CD-ROM drive. The disc tray opens partway, as shown in Figure 2–2.

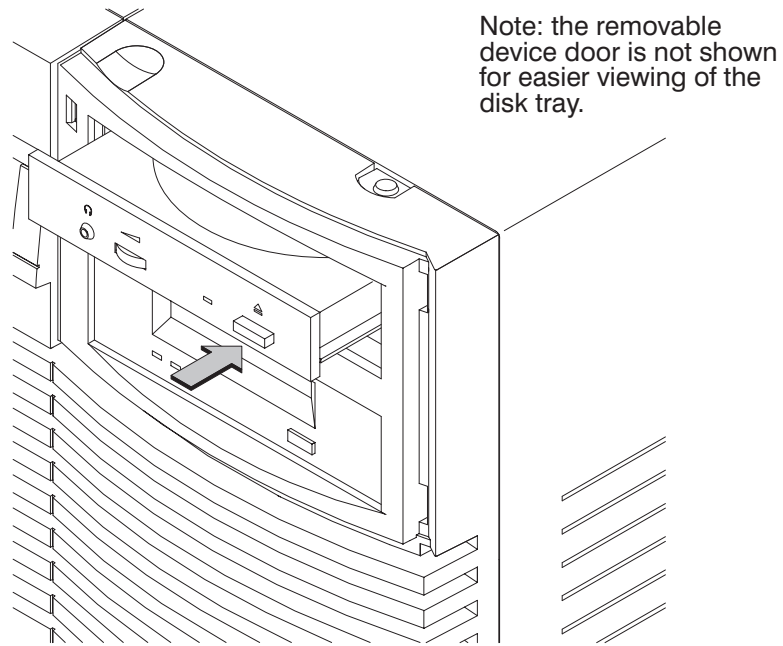


Figure 2–2. CD-ROM Disc Tray Partway Open

2. Gently pull the disc tray fully open.
3. Hold the disc by the edges with the label side up and place it in the disc tray as shown in Figure 2-3.

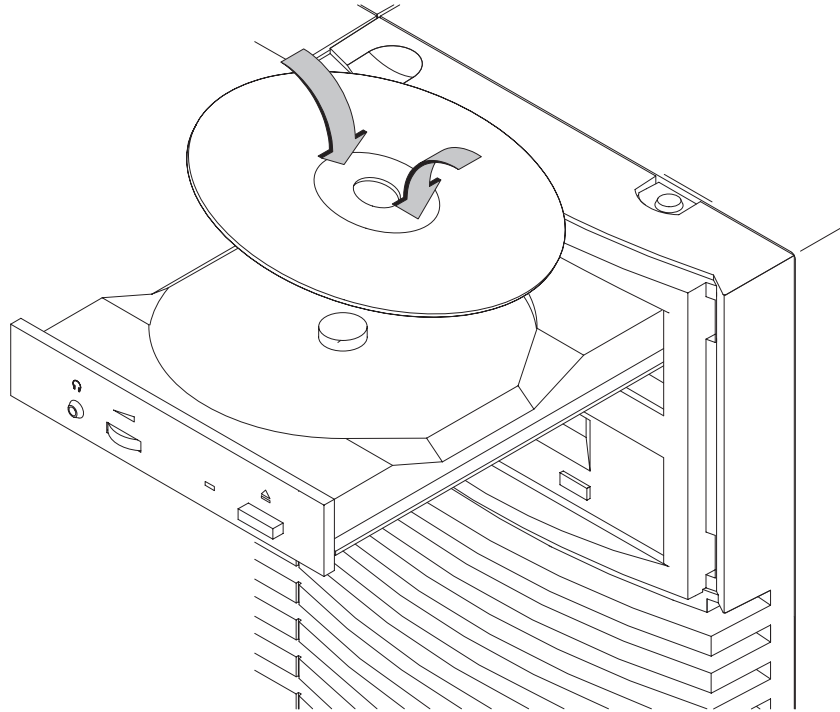


Figure 2-3. Placing the CD-ROM Disc in the Disc Tray

4. Press down gently on the center of the CD-ROM disc to make sure it is seated on the disc tray hub, shown in Figure 2-3.

5. Gently push the disc tray in until it is closed, as shown in Figure 2-4.

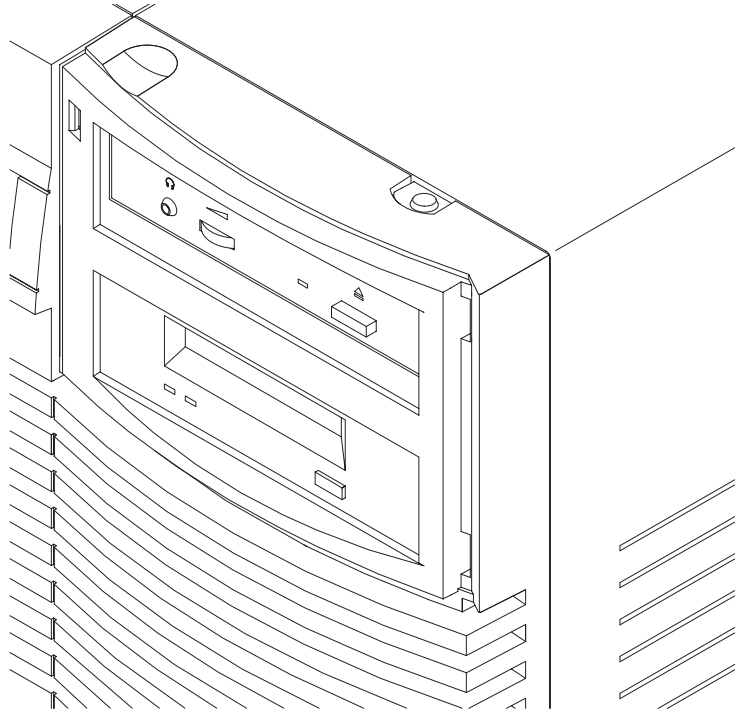


Figure 2-4. Disc Tray Closed

Unloading a CD-ROM Disc

To unload a disc from the Disc Tray, follow these steps:



1. Press and release the eject button on the CD-ROM drive. The disc tray opens approximately 1 inch, as shown in Figure 2-5.

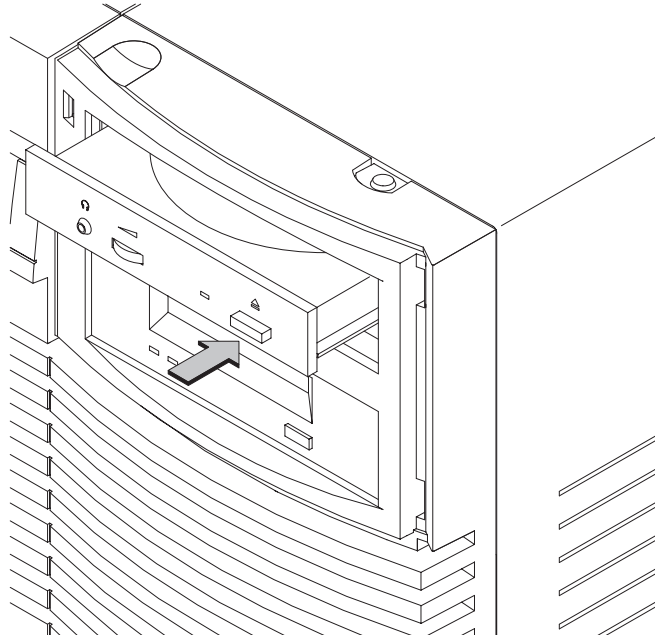


Figure 2-5. CD-ROM Disc Tray Partway Open

2. Gently pull the disc tray fully open.

3. Grasp the disc by the edges and lift it out of the disc tray, as shown in Figure 2–6. Be careful to touch only the edges of the disc.

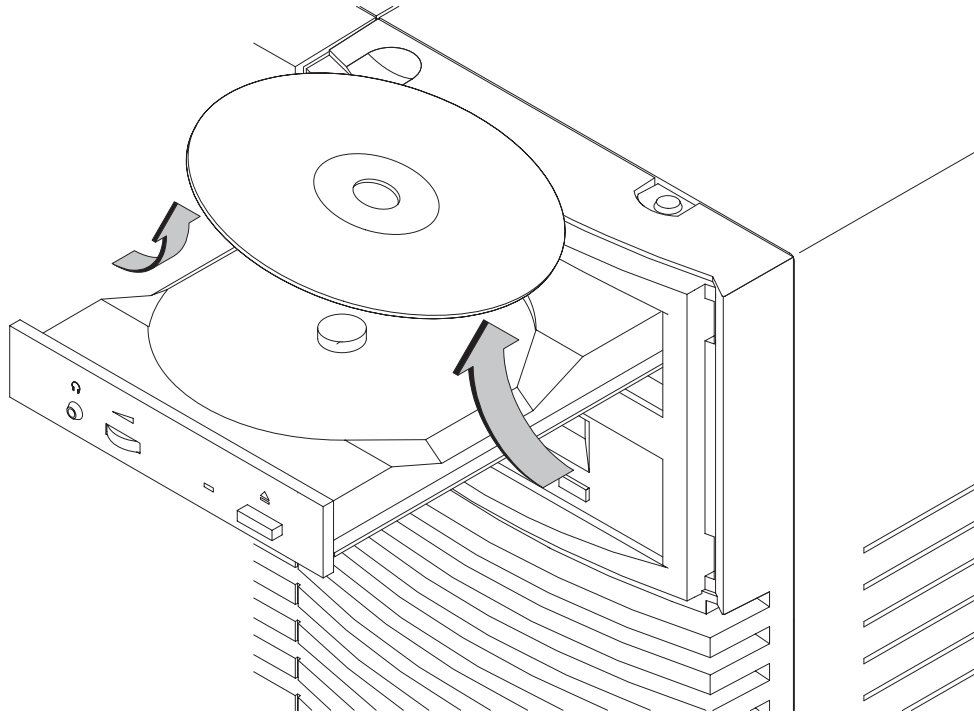


Figure 2–6. Removing the CD-ROM Disc From the Disc Tray

4. Gently push the disc tray in until it is closed, as shown in Figure 2-7.

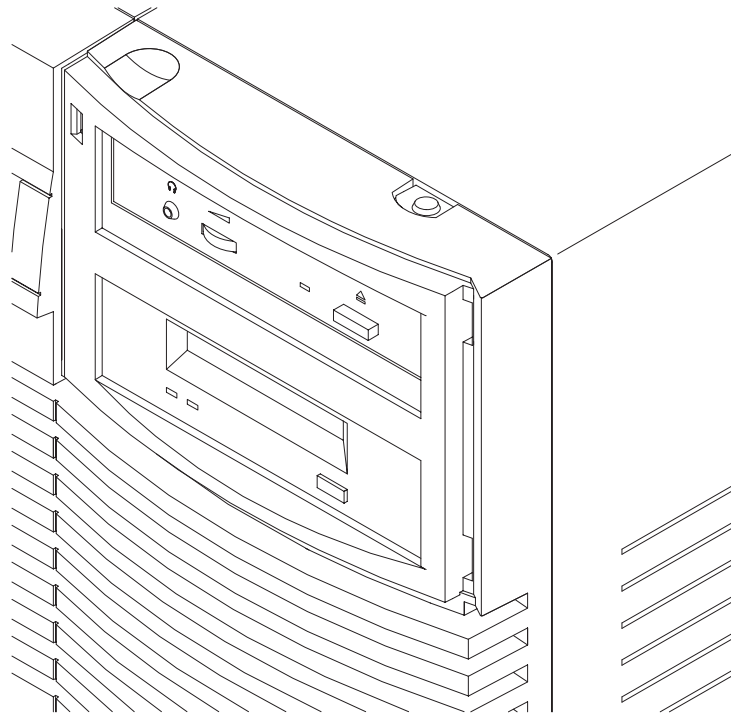


Figure 2-7. Disc Tray Closed

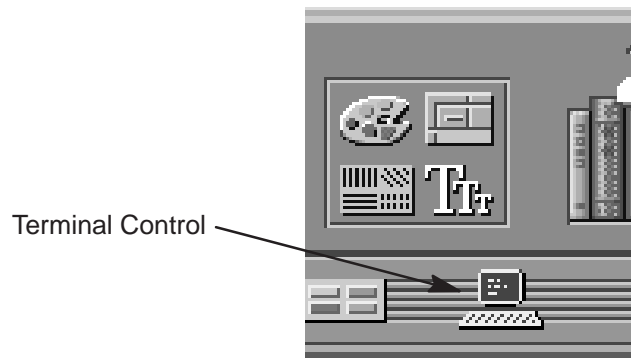
Verifying the CD-ROM Drive Operation

The **ioscan** utility verifies the configuration of all drives.

To verify that your workstation can communicate with the CD-ROM drive, follow these steps:



1. Click on the **Terminal Control** on the **Front Panel** of your Workspace.



A terminal window opens.

2. Move the mouse cursor into the terminal window and click the left mouse button.
3. Enter the following at the prompt:

```
/usr/sbin/ioscan -d sdisk  .
```

After a few moments the **ioscan** utility lists all of the SCSI I/O devices it could find. The list appears similar to the following:

```
H/W Path   Class           Description
=====
           bc
8          bc           I/O Adapter
8/0        ext_bus        GSC built-in Fast/Wide SCSI Interface
8/0.0      target
8/0.0.0    disk             QUANTUM LPS1080WD
8/0.5      target
8/0.5.0    disk             DEC      DSP3210SW
8/0.6      target
8/0.6.0    disk             DEC      DSP3210SW
8/12       ba
8/12/5     ext_bus        Built-in SCSI
8/12/5.2   target
8/12/5.2.0 disk             TOSHIBA CD-ROM XM-4101TA
8/12/5.4   target
8/12/5.4.0 disk             SEAGATE ST3600N
8/12/5.6   target
8/12/5.6.0 disk             MICROP  2112
10         bc           I/O Adapter
10/12      ext_bus        GSC add-on Fast/Wide SCSI Interface
10/12.4    target
10/12.4.0  disk             SEAGATE ST31200W
```

If **ioscan** does not see any SCSI disk drives it returns the following message:

```
ioscan: No hardware found
```

If you receive this message, go to Chapter 6, “Solving Problems.”

Using Device Files

Device files are special files that tell your system which pathway to use through the system hardware when communicating with a specific device and what kind of device it is.

To determine what device files are available for use with your CD-ROM drive, use the following procedure:



NOTICE: The device file names will depend on the naming conventions of your particular system. See “SCSI ID and Device File Information for HP-UX 10.20 or Later” in Chapter 1 of this book.

1. In a terminal window, enter the following command:

```
sam 
```

2. The **System Administration Manager (SAM)** window opens. Double-click on **Peripheral Devices** →.
3. The **Peripheral Devices** window opens. Double-click on **CD-ROM Drives** →.
4. The **CD-ROM Drives** window opens.
5. In the list of CD-ROM drives, click on the desired CD-ROM drive to select it.
6. From the **Actions** menu, click on **Show Device Files**.
A window opens with a list of the device files for the selected CD-ROM drive with an explanation of each one.

Mounting and Unmounting a CD-ROM Disc

To access information on a CD-ROM disc, you must first mount the disc. This applies to file system information only. If you wish to load a music CD, for example, you would not need to mount the disc. Mounting a disc with file system information on it gives the disc a pathname that allows your workstation to communicate electronically with it. You must unmount the CD-ROM disc before removing it from the drive.



CAUTION: To use a CD-ROM disc as a mounted file system, you must mount the CD-ROM disc **every** time you load it into the drive. You must also unmount the CD-ROM disc **every** time you unload it from the drive. Failure to mount or unmount a disc can cause a system error condition and can also require rebooting the system.

The procedures in this chapter require you to log in as **root**. If you cannot log in as **root**, contact your system administrator.

SAM (System Administration Manager) is a utility that performs system administration tasks using a windows graphical user interface.



Mounting a CD-ROM Disc Using SAM

Use the following procedure to mount a CD-ROM disc:

1. Log in as **root**. If you need information on logging in or setting up a user account, see *Using Your HP Workstation*.
2. Load the CD-ROM disc into the disc tray and gently push the tray into the drive.
3. In a terminal window, enter the following command:

```
sam 
```

4. The **System Administration Manager** window opens. Double-click on **Peripheral Devices->**.

5. The **Peripheral Devices** window opens. Double-click on **Disks and File Systems**->.

6. The **Disks and File Systems** window opens. Double-click on **CD-ROM, Floppy, and Hard Disks**.

The following screen message appears:

```
Scanning the system's hardware...
```

The **CD-ROM, Floppy, and Hard Disks** window opens containing a list of drives currently configured on this system. Disks that are unmounted have the word "unused" in the Use column.

7. From the **Actions** menu, click on **Add a Hard Disk Drive**.

8. The **Select a Disk to Add...** window opens with a list of unused disks. Highlight the CD-ROM disc you want to mount.

9. Click on .

10. The **Set Disk Usage and Options...** window opens. Select **File System** and click on .

11. The following screen messages appear:

```
Task started.
```

```
Creating the device file...
```

```
Mounting file system...
```

```
Modifying "/etc/checklist"...
```

```
Task completed.
```

Click on .

Now you can access the CD-ROM disc as you would any other mounted file system.

Unmounting a CD-ROM Disc Using SAM

Use the following procedure to unmount a CD-ROM disc:




NOTICE: Before you unmount a CD-ROM disc, make sure that your working directory (the directory in which a relative path name search begins) is set to some directory other than the one under which the disc was mounted.



CAUTION: If you wish to use a CD-ROM disc as a mounted file system, you must mount the CD-ROM disc **every** time you load it into the drive. You must also unmount the CD-ROM disc **every** time you unload it from the drive. Failure to mount or unmount a disc may cause a system error condition and may also require rebooting the system.



1. Log in as **root**. If you need information on logging in or setting up a user account, see *Using Your HP Workstation*.
2. In a terminal window, enter the following command:

```
sam 
```
3. The **System Administration Manager** window opens. Double-click on **Peripheral Devices** →.
4. The **Peripheral Devices window** opens. Double-click on **Disks and File Systems** →.

5. The **Disks and File Systems** window opens. Double-click on **CD-ROM, Floppy, and Hard Disks**.

The following screen message appears:

```
Scanning the system's hardware...
```

The **CD-ROM, Floppy, and Hard Disks** window opens containing a list of drives currently configured on this system.

6. Highlight the disc you want to unmount and click on **Remove a Hard Disk Drive** from the Actions menu.

7. A window with the following message opens:

```
Do you want to remove the disk?
```

Click on . The system reboots.

8. Press the eject button on the CD-ROM drive and remove the CD-ROM disc from the disc tray.

Reading the Busy Light

The CD-ROM busy light shows the status of the drive during the self test and during activity with the host system.

The CD-ROM drive performs the self test when one of the following happens:

- You load a disc and close the Disc Tray.
- You turn on the workstation with a disc already loaded in the CD-ROM drive.

For the self test, the busy light operates in the following sequence:

1. Light On – The busy light goes on when the disc loads into the drive.
2. Light Flashing – The light flashes six times while a read test is performed on the disc.
3. Light Off – The light goes off when the self test is complete.

The busy light stays on after the self test when one of the following conditions exist:

- A defective disc
- A disc insertion error (for example, an upside-down disc)
- No disc present

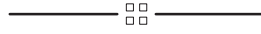
The busy light goes off when one of the following conditions exist:

- A CD-ROM drive power failure exists.
- The drive is idle on the SCSI bus.

The busy light flashes during normal activity with the system.

Troubleshooting

If you have trouble with any of these procedures for using your CD-ROM drive, see Chapter 5 of this book, “Solving Problems.”



Chapter 3

Using Your DDS Tape Drive

- DDS tape drive and data cassette descriptions
- Setting the write-protect tab on a data cassette
- Operating the DDS tape drive
- Loading and unloading a data cassette
- Using device files
- Archiving data in compressed and non-compressed mode
- Troubleshooting
- Ordering information

This chapter describes how to perform tasks that archive to and transfer data from the optional DDS tape drive. It also describes how to maintain and care for the drive. We assume the DDS tape drive is set to the factory default address of SCSI ID 3.

The instructions in this chapter assume you are using the HP-UX version 10.20 or later operating system with the HP VUE version 3.0 interface.



CAUTION: Use only data cassettes labeled DDS (Digital Data Storage) cassettes. Never use audio cassettes labeled DAT (Digital Audio Tape) in your DDS-format drive.

DDS Tape Drive and Data Cassette Descriptions

This section describes basic information needed for using your DDS tape drive and data cassettes. Depending on your configuration, your DDS drive may be a DDS-DC drive, or a DDS-2 drive.



NOTICE: In most cases, the information for using these drives is the same; however, in a few instances (such as the LED codes), the information differs for each drive. For the purposes of this discussion, wherever we refer to simply the “DDS” drive, that information is for both drives. Whenever the information differs, we will specify whether the information refers to the DDS-DC or the DDS-2 drive.

DDS Drive

Your DDS tape drive is a 3 1/2-inch form factor DDS tape drive with data compression and a SCSI interface. It conforms to the DDS format standard for storing computer data, and incorporates a data compression capability. It's a high-capacity, high transfer-rate device for data storage on tape.

Controls and Indicators

Figure 3–1 shows the LEDs and eject button of the DDS drive.

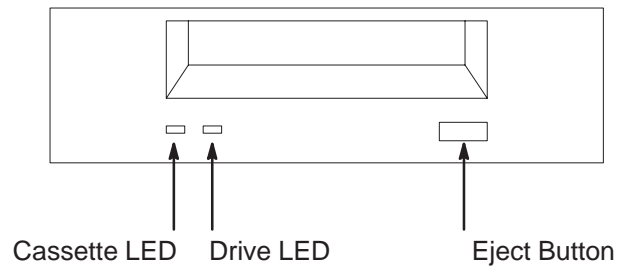


Figure 3–1. DDS Drive Controls and Indicators

LEDs (light emitting diodes) indicate different activities or problems that occur with your workstation hardware

LEDs – DDS-DC Drive

This section describes the LED codes that are displayed.

The front panel has two colored LEDs: the Cassette Light and the Drive Light. A **green** light indicates normal operation, and an **amber** light indicates a warning condition. Pulsing shows activity between the drive and the SCSI bus.

If the Cassette Light (left LED) shows steady amber, it means that the cassette is write-protected. If the Drive Light (right LED) shows steady amber, this indicates a fault condition. Table 3–1 lists the LED codes and their meanings.

Table 3–1. LED Display Codes – DDS-DC Drive

Cassette Light	Drive Light	Meaning
		Cassette (un)loading
		Cassette loaded/online
		Cassette loaded/activity
		Cassette loaded/offline
Write-Protect States		
		Cassette (un)loading
		Cassette loaded/online
		Cassette loaded/activity
		Cassette loaded/offline
Error States		
		Media wear (caution)
		High humidity
		Self-test (normal)
		Self-test (failure)

Key

OFF

Green

Amber

Pulsing Green

Pulsing Amber

Pulsing Green and Amber

LED Warning Conditions – DDS-DC Drive

The following sections describe actions to take if the LEDs indicate a warning condition.

High Humidity

If the LEDs display the high humidity signal, the humidity is too high and the drive does not perform any operations until the humidity drops.

Self-Test (Failure)

If the LEDs display the self-test (failure) signal, a fault was diagnosed during the self tests. Note the pattern of the pulses and contact your local service representative.

Media Wear (Caution)

Hewlett-Packard DDS drives continually monitor the number of errors they have to correct when reading and writing to a tape to determine tape wear and tape head cleanliness. If excessive tape wear or dirty tape heads are suspected, the drive warns you by displaying the Media Wear (Caution) signal on the LED indicators.

If the LED indicators on your DDS-format drive display the Media Wear (Caution) condition, follow this procedure:



- 1.** Check the system console for any tape error messages. A hard error during a read or write operation may have occurred.
- 2.** Clean the heads with a cleaning cassette (HP92283K) as described in the “Cleaning the Tape Heads” section, later in this chapter.
- 3.** Repeat the operation you performed when the Media Wear (Caution) signal displayed. If the Media Wear (Caution) signal still displays, then the data cassette should be replaced.

4. If you are performing a backup from disk to tape, discard the data cassette and back up your files using a new data cassette.

5. If you are performing a restore from tape to disk, complete the restore, then discard the data cassette and back up the files to a new data cassette.

LEDs – DDS-2

The front panel has two colored LEDs: the Tape Light and the Clean/Attention Light. The Tape Light flashes **green** to show activity (loading, unloading, reading, and writing). Steady green means a cartridge is loaded.

The Clean/Attention Light flashes **amber** to indicate head cleaning is needed or a cartridge is near the end of its life. Steady amber means a hard fault.

Table 3–2. LED Display Codes – DDS-2 Drive

Tape Light	Clean/Attention	Meaning	Key	
		Activity – load or unload		OFF
		Activity – read or write		Steady Green
		Cartridge loaded		Steady Amber
Any		Cleaning needed		Flashing Green 1/2 sec on, 1/2 sec off
Any		Fault		Flashing Amber 1/2 sec on, 1/2 sec off
				Fast Flash Green 1/4 sec on, 1/4 sec off

Data Cassettes

Media Life

HP DDS data cassettes are currently specified to 2000 passes over any part of the tape under optimal environmental conditions (50% relative humidity, 22 degrees C). During a tape operation, any one area of the tape may have multiple passes over the heads. This translates into approximately 200 to 300 backups or restores.

Under certain conditions, the life of your data cassette is less. Replace your data cassettes after 100 backups or restores if your operating conditions meet any of the following criteria:

- The relative humidity in your operating environment is consistently less than 50%.
- You know that the backup software you are using makes multiple passes over sections of the tape during backups or restores.
- You notice that when you do backups and restores the tape stops and starts frequently.

Cleaning the Tape Heads

Clean the heads of your tape drive after every 25 hours of tape drive use or if the Media Wear (Caution) signal is displayed on the LED.



NOTICE: Only use HP Cleaning Cassettes (HP92283K) to clean the tape heads. Do not use swabs or other means of cleaning the tape heads.

Follow this procedure to clean the tape heads:



1. Insert the cleaning cassette into the drive. The tape automatically loads the cassette and cleans the heads. At the end of the cleaning cycle, the drive ejects the cassette.
2. Write the current date on the label on the cleaning cassette so that you know how many times you have used it. Discard the cleaning cassette after you have used it 25 times.

Media Restrictions

If you interchange media between other HP workstation DDS tape drives, note that data cassettes with compressed data can only be read by tape drives that have data compression capabilities. This includes data cassettes that contain both compressed and noncompressed data.

Setting the Write-Protect Tab on a Data Cassette

You can only store or change information on a data cassette when the write-protect tab is in the *write* position. So, before trying to write to the data cassette, make sure that the write-protect tab is in the *write* position, as shown in Figure 3–2.

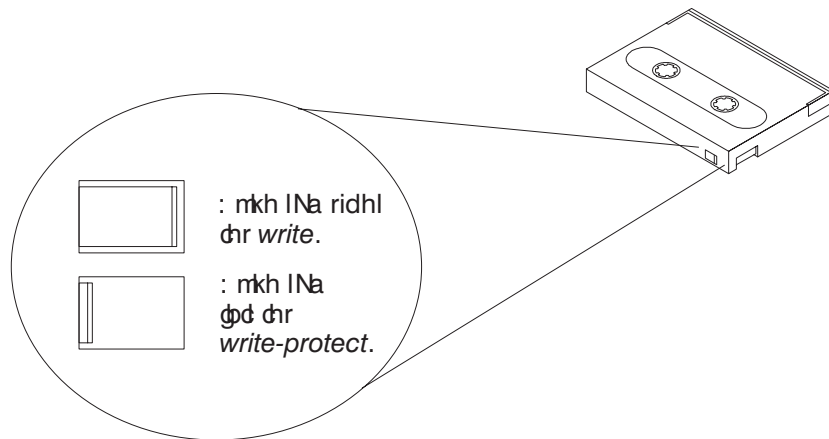


Figure 3–2. Setting the Write-Protect Tab on a DDS Tape

To protect information on a data cassette from being overwritten, set the write-protect tab to the *write-protect* position, as shown in Figure 3–2.



NOTICE: The write-protect tab should always be in the *write* position for transferring data to a cassette.

Operating the DDS Tape Drive

This section describes how to perform tasks with your DDS tape drive.

Loading and Unloading a Data Cassette

Follow these steps to load and unload a data cassette in the DDS tape drive:



1. Turn on power to the tape drive.
2. Insert the data cassette into the drive, as shown in Figure 3-3.

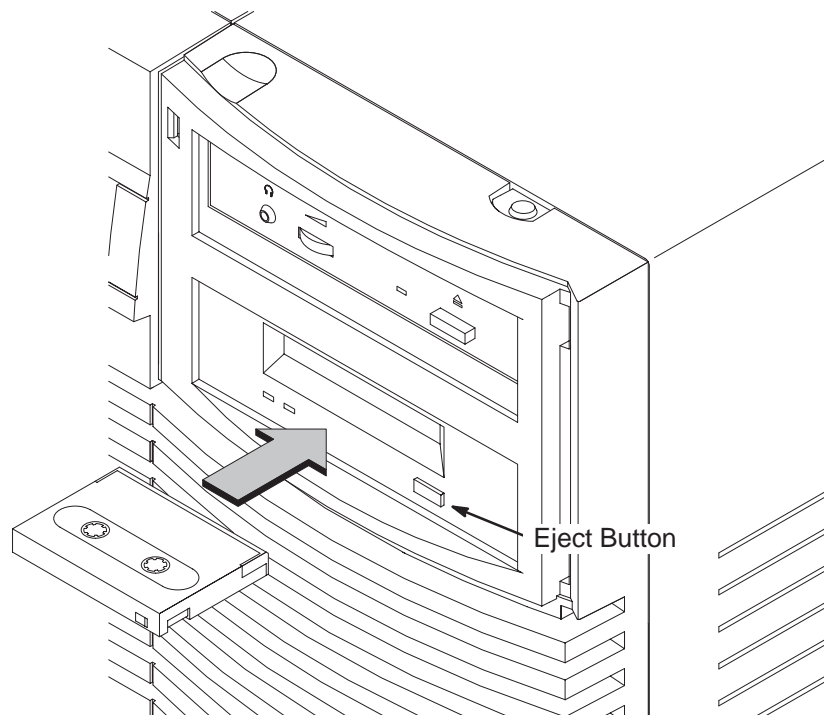



Figure 3-3. Loading a Data Cassette

3. Push the data cassette about three quarters of the way into the drive. The drive automatically pulls the data cassette the rest of the way in. When the LEDs on the front of the drive stop flashing, the drive has loaded the data cassette.

4. To remove the data cassette, press and release the eject button on the front of the drive, as shown in Figure 3–3. The LEDs on the drive flash on and off. Ten to twenty seconds later, the data cassette slides partway out of the drive. Remove the cassette from the drive.

Verifying the DDS Tape Drive Operation

Type the following:

```
/usr/sbin/ioscan -d stape 
```


After a few moments the **ioscan** utility returns a message similar to the following:

```
H/W Path      Class      Description
=====
                bc
8              bc              I/O Adapter
8/12           ba              Core I/O Adapter
8/12/5         ext_bus    Built-in SCSI
8/12/5.3       target
8/12/5.3.0     tape      HP          HP35480A
```

If **ioscan** does not see any SCSI drives it will return the following message:

```
ioscan: No hardware found
```

If you receive this message, go to Chapter 5, “Solving Problems.”

Device files are special files that tell your system which system hardware pathway to use when communicating with a specific device and what kind of device it is.

Using Device Files

Your system has four default device files for use with your tape drive: two device files for noncompressed mode and two device files for compressed mode. If you use these device files, you do not need to create any device files.

If the SCSI address of your tape drive is not set to the factory default of SCSI ID 3, you must create a device file, then substitute the path-name of your device file in the examples that follow. Refer to the *System Administration Tasks* manual for information on how to create a device file.



NOTICE: The device file names depend on the naming conventions of your particular system. See your Using HP-UX manuals for more information.

Device Files — No Data Compression

Your system has two device files for using your tape drive with data compression turned off. The device files are named `/dev/rmt/3m` and `/dev/rmt/3mn`, and are set for SCSI ID 3.

If you use the `/dev/rmt/3m` device file, the tape drive rewinds the data cassette every time the system releases the drive from its control.

If you use the `/dev/rmt/3mn` device file, the drive does not rewind the data cassette. The tape stays where it was after the last operation.

If you use these device files, you do not need to create any device files.

Determining Available Device Files

1. In a terminal window, enter the following command:

```
sam 
```

2. The **System Administration Manager** window opens. Double-click on **Peripheral Devices** →.

3. The **Peripheral Devices** window opens. Double-click on **Tape Drives** ->.
4. The **Tape Drives** window opens.
5. In the list of tape drives, click on the desired tape drive to select it.
6. From the Action menu, click on **Show Device Files**.

A window opens with a list of the device files for the selected tape drive with an explanation of each one.

Device Files — Data Compression

If you wish to use the data compression feature, use the device files `/dev/rmt/3hc` and `/dev/rmt/3hcn`, which are set for SCSI ID 3.

If you use the `/dev/rmt/3hc` device file, the tape drive compresses the data and rewinds the data cassette every time the system releases the drive from its control.

If you use the `/dev/rmt/3hcn` device file, the drive compresses the data, but does not rewind the data cassette. The tape stays where it was after the last operation.

If you use these device files, you do not need to create any device files.

The **tar** (tape file archiver) command saves files to a data cassette, restores files from a data cassette, or lists files on a data cassette.



Archiving Data in Compressed and Noncompressed Mode

This section describes how to transfer data to and from a DDS-format data cassette (saving and restoring) using the HP-UX **tar** command and your tape drive's device file.

NOTICE: Before using your DDS-format tape drive to back up your file system, make sure you read the “Media Interchangeability Restrictions” section later in this chapter.

The **tar** (tape file archiver) command allows you to save files to a data cassette, restore files from a data cassette to your system, or list files on your data cassette.

Writing to a Data Cassette

Use the following instructions to save files to a data cassette:



1. Check that the write-protect tab on the data cassette is in the *write* position.
2. Load the data cassette into the tape drive.
3. In a terminal window, enter the following command line to write to the tape:

```
tar -cvf /dev/rmt/devicefile pathname 
```

where *devicefile* is one of the device files listed from **sam**, and *pathname* is the pathname of the file or directory containing files that you want to write to the tape. To use the data compression mode, use one of the device file names that **sam** listed as supporting compression. .

Restoring Files from a Data Cassette to Your System

Use the following instructions to restore files from a data cassette to your system:



1. Load the data cassette into the tape drive.
2. In a terminal window, use **cd** to change to the directory in which you want the files to reside.
3. Enter the following command line:

```
tar -xvf /dev/rmt/devicefile pathname 
```

where *devicefile* is one of the device files listed from **sam**, and *pathname* is the pathname of the file or directory containing files that you want to restore from the tape. If *pathname* is not specified, everything on the data cassette is restored. To use the data compression mode, use one of the device file names that **sam** listed as supporting compression..

Listing the Files on a Data Cassette

Use the following instructions to list the files on a data cassette:



1. Load the data cassette into the tape drive.
2. In a terminal window, enter the following command line to receive a file listing of the data cassette:

```
tar -tvf /dev/rmt/devicefile 
```

where *devicefile* is one of the device files listed from **sam**. If the tape was made with data compression, use on the the device file names that **sam** listed as supporting compression.

The **man** utility looks up man pages on the system.

Further Command Information

For additional information on using **tar** and a complete list of the command arguments, refer to the **tar** man page by typing the following:

```
man tar 
```

You may also communicate with the tape drive with the **cpio**, **ftio**, **mt**, and **fbackup** commands. For more information on these commands, enter the following in a terminal window:

```
man command 
```

Media Interchangeability Restrictions

If you interchange media between DDS-format tape drives, the following two restrictions apply to the media:

- Data cassettes with compressed data can only be read by tape drives that have data compression capabilities, such as the tape drive (part number C1504-67201) found in Kit A2275A #AHS.
- Full height (5 1/4-in) DDS-format tape drives (models HP 35470A and HP35480A) can get 1.3 GB and can read or write to 60-meter data cassettes only, if they are not using data compression. With data compression, these drives can get 2 GB and can read or write to 90-meter cassettes.

Troubleshooting

If you have trouble with any of these procedures for using your DDS tape drive, see Chapter 6 of this book, “Solving Problems.”

Ordering Information

To order Hewlett-Packard data cassettes and cleaning cassettes for use in your DDS tape drive, use the following order numbers:

- HP92283A Box of five 60-meter DDS data cassettes
- HP92283B Box of five 90-meter DDS data cassettes
- HP92300A Box of five 120-meter DDS data cassettes
(for DDS-2 drive only)
- HP92283K Package of two cleaning cassettes
- HP92283L Lockable storage box for 12 cassettes



CAUTION: Use only data cassettes labeled as DDS (Digital Data Storage) cassettes. Never use audio cassettes labeled DAT (Digital Audio Tape) in your DDS-format drive.



Chapter 4

Using Your 3.5-Inch Floppy Disk Drive

- Setting the write-protect tab on a diskette
- Inserting and removing a diskette
- Verifying the floppy disk drive configuration
- Using device files
- Floppy disk drive device file
- Formatting a new diskette
- Transferring data to and from a floppy diskette
- Configuring the floppy driver
- Troubleshooting
- Ordering information

This chapter describes how to perform tasks that allow you to archive to or transfer data from the optional 3.5-inch floppy disk drive.

The instructions in this chapter assume you are using the HP-UX version 10.20 or later operating system with the HP VUE version 3.0 interface.



NOTICES: When examples of user input are given in this chapter, enter them at the command-line prompt in an HP VUE terminal window or HP-UX shell.

Some procedures in this chapter require you to log in as **root**. If you cannot log in as **root**, contact your system administrator.

Using the Floppy Diskette

This section describes basic information needed for using your floppy diskettes.

Setting the Write-Protect Tab on a Diskette

You can only store or change information on a diskette when the write-protect tab is in the *write* position. So, before trying to write to the diskette, make sure that the write-protect tab is in the *write* position, as shown in Figure 4-1.

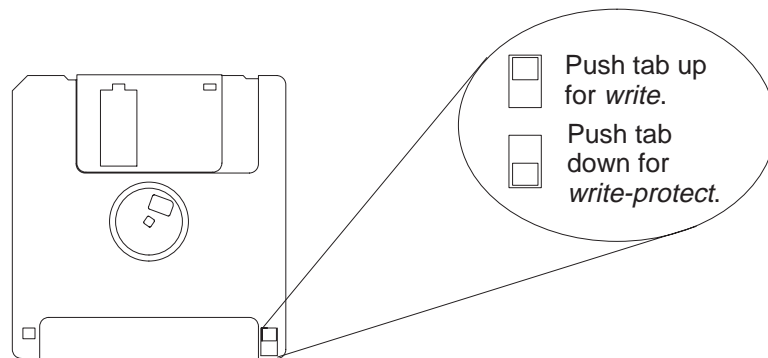


Figure 4-1. Setting the Write-Protect Tab on a Floppy Diskette

To protect files on a diskette from being overwritten, set the write-protect tab to the *write-protect* position.



NOTICE: The write-protect tab should always be in the *write* position for formatting a new diskette and transferring data to a diskette.

Inserting and Removing a Diskette

Follow these steps to insert and remove a diskette from the floppy disk drive:



1. Insert the diskette into the drive, as shown in Figure 4-2.

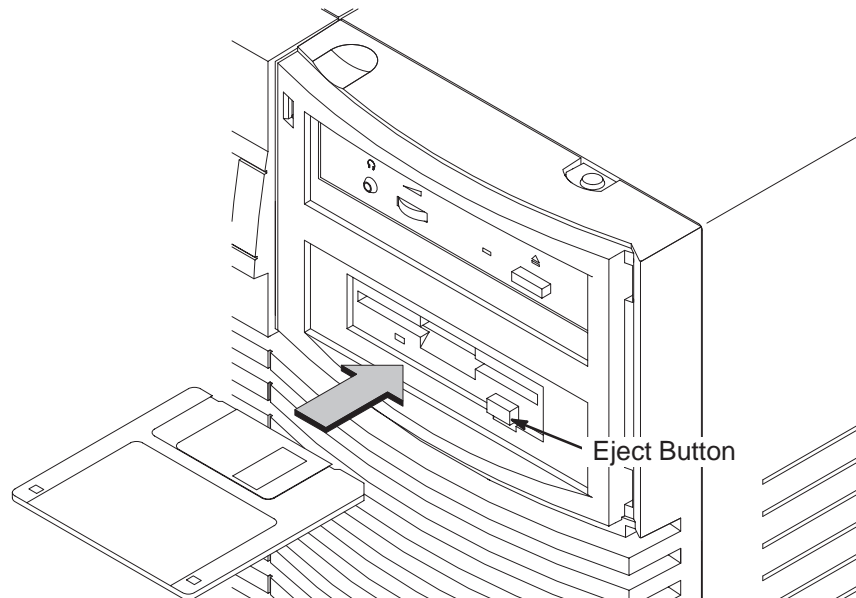


Figure 4-2. Inserting and Removing a Floppy Diskette

2. Push the diskette into the floppy drive until it clicks into place.
3. To remove the diskette, push the eject button (see Figure 4-2), then take out the diskette.

Operating the Floppy Drive

This section describes how to perform tasks with your 3.5-inch floppy disk drive.

The **ioscan** utility verifies the configuration of all drives.

Verifying the Floppy Drive Configuration

To verify that your workstation can communicate with the floppy drive, use the **ioscan** command in a terminal window to see which devices are currently in use on your system:

1. Enter the following at a command prompt:

```
/usr/sbin/ioscan -d sflop 
```

After a few moments the **ioscan** utility lists all of the SCSI floppy I/O devices it could find. The list appears similar to the following:

```
H/W Path      Class          Description
=====
                bc
8              bc            I/O Adapter
8/12           ba            Core I/O Adapter
8/12/5        ext_bus       Built-in SCSI
8/12/5.0      target
8/12/5.0.0    disk         TEAC FC-1 HF 07
```

If **ioscan** does not see any SCSI drives it returns the following message:

```
ioscan: No hardware found
```

If you receive this message, go to Chapter 6, “Solving Problems.”

If the floppy driver is not configured, **ioscan** returns the following message:

```
ioscan: Device driver scsifloppy is not in the kernel
```

If you receive this message, go to the section, “Configuring the Floppy Driver” later in this chapter for information on adding the **scsifloppy** driver to the HP-UX kernel configuration.

Using Device Files

Device files are special files that tell your system which pathway to use through the system hardware when communicating with a specific device and what kind of device it is.



NOTICE: The device file names depend on the naming conventions of your particular system. See “SCSI ID and Device File Information for HP-UX 10.20 or Later” in Chapter 1 of this book.

If you set the SCSI address of your floppy drive to a value other than 0, you must create a device file for it. Refer to the *System Administration Tasks* manual for information on how to create a device file.

To determine what device files are available for use with your floppy drive, use the following procedure:

1. In a terminal window, enter the following command:

```
sam 
```

2. The **System Administration Manager** window opens. Double-click on **Disks and File Systems**→.
3. The **Disk and File Systems** window opens.

4. In the list of drives, click on the floppy drive listing to select it.

5. From the **A**ctions menu, click on **V**iew More Information.

A window opens with a list of information for the floppy drive, including the device files.

Formatting a New Diskette

You must always format a new floppy diskette with the **mediainit** utility before using it. To format a new floppy diskette follow these steps:



1. Log in as **root**.
2. Make sure that the write-protect tab on the floppy diskette is in the *write* position, as shown in Figure 4-1.
3. Insert the diskette into the floppy disk drive.
4. In a terminal window, execute **mediainit** with an interleave of 2 by entering the following:

```
mediainit -i 2 devicefile 
```

where *devicefile* is the device file as listed by **sam**.

Transferring Data To and From a Floppy Diskette

The **tar** (tape file archiver) command saves files to a floppy diskette, restores files from a floppy diskette, or lists files on a floppy diskette.

This section describes how to transfer data to and from your floppy diskette (saving and restoring) using the HP-UX **tar** command with your floppy drive's device file.

You need to set the write protect tab to the *write* position to transfer data to the diskette. The write-protect tab can be in either position when restoring data from a diskette or listing the files on a diskette.

Saving Files to a Floppy Diskette

Use the following instructions to save files to a floppy diskette:



1. Check that the write-protect tab on the floppy diskette is in the *write* position.
2. Load the formatted floppy diskette into the disk drive.
3. In a terminal window enter the following command line to write to the diskette:

```
tar -cvf devicefile pathname 
```

where *devicefile* is the device file as listed by **sam** and *pathname* is the pathname of the file or directory containing files that you want to write to the diskette.

Restoring Files from a Floppy Diskette to Your System

Use the following instructions to restore files from a floppy diskette to your system:



1. Load the floppy diskette into the disk drive.
2. In a terminal window, use the **cd** command to change to the directory you want the files to reside in:

```
cd directory_path 
```

where *directory_path* is the pathname of the directory.

3. Enter the following command line:

```
tar -xvf devicefile pathname 
```

where *devicefile* is the device file as listed by **sam** and *pathname* is the pathname of the file or directory containing files that you want to restore from the diskette. If you do not specify *pathname*, everything on the floppy diskette is restored.

Listing the Files on a Floppy Diskette

Use the following instructions to list the files on a floppy diskette:



1. Load the floppy diskette into the disk drive.
2. In a terminal window, enter the following command line:

```
tar -tvf devicefile 
```

where *devicefile* is the device file as listed by **sam**

All files on the floppy diskette are listed.

For More Information

The **man** utility looks up man pages on the system.

For more information on using **tar** and a complete list of the command arguments, refer to the **tar** man page by typing the following in a terminal window:

```
man tar 
```

You can mount the floppy drive as a file system using the SAM utility. Be sure to unmount the drive before removing it as a file system. For more information about how to mount and unmount the floppy drive, see the manual *Using HP-UX* (B2910-90001).

For more information on copying data to or from your system to other media, including your floppy diskette, refer to the **cpio** man page by typing the following in a terminal window:

man cpio

For more information on copying to or from DOS files, refer to the **doscp** man page by typing the following in a terminal window:

man doscp

For more information on listing DOS directories, refer to the **dosls** man page by typing the following in a terminal window:

man dosls

For more information on using your floppy disk drive and floppy diskettes, refer to the **floppy** man page by typing the following in a terminal window:

man floppy

For more information on using the **mediainit** command, refer to the **mediainit** man page by typing the following in a terminal window:

man mediainit

Configuring the Floppy Driver

If you reload software or rebuild the Instant Ignition system on your workstation, you need to reconfigure the HP-UX Kernel to add the floppy driver. Use the SAM utility to add the **SCSI flexible disk** driver and build a new HP-UX kernel.

For more information about how to reconfigure the kernel using SAM, see the following manuals:

- *System Administration Tasks HP 9000 Series 700 Computers* (B2355-90040)
- *Using HP-UX* (B2910-90001)

Troubleshooting

If you have trouble with any of these procedures for using your floppy disk drive, see Chapter 5 of this book, “Solving Problems.”

Ordering Information

To order Hewlett-Packard micro flexible diskettes for use in your 3.5-inch floppy disk drive, use the following order number:

HP-92192X	High-Density Micro Flexible Disks (1.44MB Formatted Capacity) – box of ten diskettes
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Chapter 5

Solving Problems

- Common problems and solutions
- Dealing with a boot failure
- Memory failures
- LCD-indicated problems
- Running system verification tests

This chapter contains information to help you determine what's wrong with your system when you have problems. If you have a problem that isn't listed in this chapter, or if your problem persists, contact your designated service representative. When calling for service, always have your system's model number and serial number ready.

The instructions in this chapter assume you are using the HP-UX version 10.20 or later operating system with the HP VUE version 3.0 graphical interface. If your system is configured with the HP CDE graphical user interface, use command line options in a terminal window to perform tests.



NOTICE: The J282/2240 power supply draws about 50 Watts in standby mode(system off) and will turn on a fan when required to cool the supply.



NOTICE: The J282/2240 fan failure circuitry requires that the power cord must be disconnected for 30 seconds after any fan failure.

Common Problems and Solutions

The tables in this section list common problems you may encounter with your workstation. The tables also tell you what to do to help solve the problems.

Table 5–1. Problems Powering Up the System

Problem	Solution
The power LED doesn't light.	Make sure all ac power cables are connected securely to the system. Make sure the power cord is plugged into a working ac outlet. Make sure the power switch is set to the ON position.
The power LED lights, but the screen is blank or flickers	Press the brightness control on the monitor to adjust it. If the screen is still blank, turn off the system and monitor power switches. When the system is completely powered off, check the video cable connections. Go to the section "Changing Your Monitor Type" in Appendix B for information about displaying and setting your workstation's monitor configuration.
LCD messages	See "LCD-Indicated Problems" later in this chapter.
If problems persist, contact your system administrator or call your designated service representative.	

Table 5–2. Problems Loading and Booting the Operating System

Problem	Solution
<p>The power LED is lit, and text appears on the screen, but more than two minutes have passed with no sign of system activity.</p> <p>The system stops or hangs while booting.</p>	<p>Make sure that all SCSI devices are set to the proper SCSI ID. (See Appendix C for default SCSI ID settings.)</p> <p>Check that all SCSI devices are correctly cabled. Check that the SCSI bus is correctly terminated. (See Appendix C for information on SCSI cabling and termination.)</p> <p>Follow the instructions in “Dealing With a Boot Failure,” later in this chapter.</p>
<p>If problems persist, contact your system administrator or call your designated service representative.</p>	

Table 5-3. Problems with the 802.3 Network

Problem	Solution
Can't reach other systems on the network. Applications that rely on the network won't run.	Check the network connector on the back of the system unit. Make sure that the network cable or transceiver is fastened securely to the connector.
If problems persist, contact your system administrator or call your designated service representative.	

Table 5-4. Problems Using a Hard Disk Drive

Problem	Solution
<p>The disk drive is not accessible or does not respond.</p>	<p>Make sure that all SCSI devices are set to the proper SCSI ID. (See Appendix C for default SCSI ID settings.)</p> <p>Check that all SCSI devices are correctly cabled. Check that the SCSI bus is correctly terminated. (See Appendix C for information on SCSI cabling and termination.)</p> <p>Make sure that the system can communicate with the drive as described in “Checking the SCSI IDs” in Appendix B.</p> <p>Follow the instructions in “Dealing With a Boot Failure” later in this chapter.</p>
<p>If problems persist, contact your system administrator or call your designated service representative.</p>	

Table 5-5. Problems Using the CD-ROM Drive

Problem	Solution
The CD-ROM drive does not respond to commands.	<p>Re-enter the commands and make sure that you have typed them correctly.</p> <p>Make sure that the system can communicate with the drive as described in “Checking the SCSI IDs” in Appendix B.</p> <p>Follow the instructions in the section entitled “Running System Verification Tests” later in this chapter to verify that the CD-ROM drive is functioning properly.</p>
If problems persist, contact your system administrator or call your designated service representative.	

Table 5–6. Problems Using the DDS Tape Drive

Problem	Solution
<p>The DDS tape drive does not respond to commands.</p>	<p>Re-enter the commands and make sure that you have typed them correctly.</p> <p>Make sure that you specified the correct device file name for commands that require a device file name.</p> <p>Make sure the write-protect tab is set to <i>write</i> if you are trying to copy data to a data cassette.</p> <p>Make sure that the system can communicate with the drive as described in “Checking the SCSI IDs” in Appendix B.</p> <p>Follow the instructions in the section entitled “Running System Verification Tests” later in this chapter to verify that the tape drive is functioning properly.</p>
<p>If problems persist, contact your system administrator or call your designated service representative.</p>	

Table 5-7. Problems Using the Floppy Disk Drive

Problem	Solution
<p>The floppy drive does not respond to commands.</p>	<p>Re-enter the commands and make sure that you have typed them correctly.</p> <p>Make sure that you specified the device file <code>/dev/rfloppy/c201d0s0</code> for commands that require a device file name.</p> <p>Make sure that the write-protect tab is set to <i>write</i> if you are trying to copy data to a floppy diskette.</p> <p>Follow the instructions in the section entitled “Running System Verification Tests” later in this chapter to verify that the floppy drive is functioning properly.</p>
<p>If problems persist, contact your system administrator or call your designated service representative.</p>	

Dealing with a Boot Failure

If your usual boot device (typically a disk) is not responding as it should, you must try to boot from the disk (or another boot device) by selecting it manually.

To boot a device manually, follow these steps:



1. Follow the directions in “Accessing the Boot Console Interface,” in Appendix D of this book.



NOTICE: Your workstation automatically shuts down the operating system before it terminates the power.

2. At the Main Menu prompt, type the following:

```
Main Menu: Enter a command or a menu > search ipl 
```

The **search** command looks for bootable media on your workstation.

This causes your workstation to search *exhaustively* for bootable media.

3. Boot from one of the listed devices by typing the following at the prompt:

```
Main Menu: Enter a command or a menu > boot device 
```

where *device* is the **hardware path** to the device, specified in mnemonic style notation, such as **FWSCSI.5.0**.

4. If your workstation still fails to boot, there is either something wrong with the file system or with the hardware. If you suspect a file system failure, see the manual *Using HP-UX* for help on dealing with file system failures. If you think that something is wrong with the hardware, continue reading this chapter for more troubleshooting information.

Memory Failures

J Class systems use Memory Page Deallocation, a feature that allows the system to provide information to the operating system about memory failures.

HP-UX 10.20 uses Memory Page Deallocation information to map out the failing memory areas, and continue normal operation. You can use the command **memrpt** with the detail switch to obtain information about the Memory Page Deallocation Table (PDT) as well as single bit errors logged by the system.

```
# /usr/sbin/sysdiag   
DUI >logtool   
LOGTOOL> memrpt detail 
```



NOTICE: You must be logged in as superuser to use the **memrpt** command.

To exit the sysdiag and logtool utilities, use the **exit** command.

The pdt can also be checked using the **pdt** command in the Service menu of the boot console handler. If a failing DIMM is replaced, use the Service menu **pdt clear** command to clear out the PDT.

LCD-Indicated Problems

Your workstation uses an LCD panel to display firmware/OS progress codes. The codes, referred to as chassis codes, consist of one of the mnemonics listed below, followed by a 4-digit hex number identifying the code module being executed. The mnemonics and their meaning are:

- FLT – A hardware error has been detected
- TEST – Hardware being tested
- INIT – Hardware being initialized
- SHUT – System being shutdown
- WARN – A non-optimal operating condition exists
- RUN – System is running operating system

During a normal boot sequence, a set of “windows” appear. In general, the LCD display has the following format:

g g g g	N b c	♥	← aikh .
d d d d d d d d d d d d d d			← aikh :

ZZZZ ----- > 4 character OSTAT
YYYY ----- > 4 digit hex code
CPUXX ----- > Functional CPUs in system
♥ ----- > Heart beat
WWWWWWWWWWWWWWWW- > Text Diagnostic Message

The windows are as follows:

Window 1

When the system is hard booted, the LCD will be cleared and the following message will be displayed for approximately 1 second. Then the processor dependent hardware (pdh) is verified.

```
Proceeding To      <- line 1
Turn DC On        <- line 2
```

Window 2

While the pdh is being verified, the following message is displayed:

```
ZZZZ YYYY        <- line 1
Selftest Sys Bd  <- line 2
```

Window 3

After the pdh is verified, the selftest is executed. The display changes to:

```
ZZZZ YYYY      ♥ <- line 1 - '♥' flashes with Z Y field change
Selftest       <- line 2
```

Window 4

When the selftest is complete, the message (once the console is found) is:

```
ZZZZ YYYY CPUXX♥ <- line 1 - '♥' flashes with Z Y field change
AAAAAAAA console <- line 2
```

where AAAAAA is RS-232A, RS-232B, or GRAPHICS.

Window 5

When an attempt to boot is made, the following message is displayed once IPL is successfully loaded and launched:

```
ZZZZ YYYY CPUXX♥ <- line 1 - '♥' flashes with Z Y field change  
BBBBBBBBBBBBBBBB <- line 2
```

where BBBBBBBBBBBBBBBBBB is the model number (for example, 9000/J200).

If the system encounters an FLT code while the system is booting, the FLT code is interpreted and a message is displayed. For the meaning of the fault code, see the J Class Service Handbook.

Running System Verification Tests

HP-UX uses a diagnostics product called the Support Tools Manager that allows system operation verification.

You can access the Support Tools Manager in a terminal window. If you are using HP VUE as your interface, you can also access the Support Tools Manager through the **sys_admin** directory.

Three interfaces are available with the Support Tools Manager: a command line interface (accessed through the **cstm** command), a menu-driven interface (accessed through the **mstm** command), and the graphical user interface (accessed through the **xstm** command).

For more information on these user interfaces, see the online man pages by entering the following at a command line prompt:

```
man cstm 
```

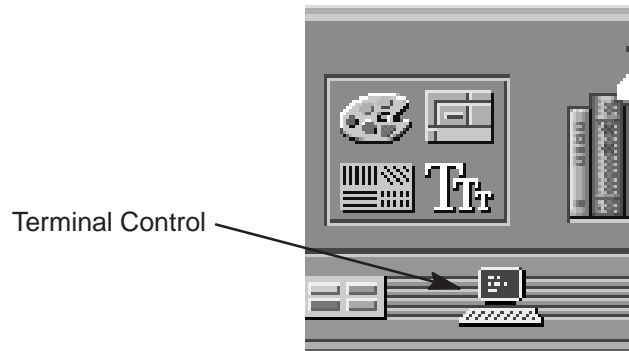
```
man mstm 
```

```
man xstm 
```

To access the Support Tools Manager, perform the following steps:



1. Click on the **Terminal Control** on the **Front Panel** of your Workspace.



A terminal window opens.

2. Move the mouse cursor into the terminal window and click the left mouse button.
3. Enter the following at the prompt:

```
cstm 
```

The following screen appears:

```
Support Tool Manager      Version A.01.00  
Type 'help' for a list of available commands.  
CSTM>
```

At the CSTM> prompt, you can enter several commands. To see what commands are available, type the **help** command.

4. To verify the system operation, type the following at the CSTM> prompt:

```
CSTM> verify all 
```

Messages similar to the following appear:

```
Verification has started on device (CPU).  
Verification has started on device (FPU).  
  
CSTM>Verification of (FPU) has completed.  
CSTM>Verification of (CPU) has completed.
```

5. Press to return to the CSTM> prompt after all test results are reported.

6. To exit the Support Tools Manager, type the following:

CSTM> **exit**

If any tests failed, further diagnosis is necessary by qualified service personnel. Contact your designated service representative.

————— ☐☐ —————

Appendix A

Safety and Regulatory Statements

- Declaration of conformity
- Emissions regulations
- Emissions regulations compliance
- Datacom users statement
- Acoustics
- Electrostatic discharge (ESD) precautions
- Laser safety statements
- Warnings and cautions

This appendix contains safety and regulatory statements pertaining to your J282/2240 workstation.

DECLARATION OF CONFORMITY
according to ISO/IEC Guide 22 and EN45014

Manufacturer's Name: Hewlett Packard
Manufacturer's Addresses: 100 Domain Drive
Exeter, N.H. 03833
USA

declares that the product

Product Name: Computer Workstation
Model Number: HP 9000 / J200 Series
Base Product Number: A4081A
Product Options: All

conforms to the following Product Specifications:

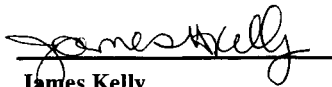
Safety: IEC 950:1992 + A1, A2 / EN 60950:1992 + A1, A2
EMC: CISPR 22:1985 / EN 55022:1988 Class B (1)
EN 50082-1:1992
IEC 801-2: 1991 / prEN 55024-2:1992 - 3 kV CD, 8 kV AD
IEC 801-3: 1984 / prEN 55024-3:1991 - 3 V/m
IEC 801-4: 1988 / prEN 55024-4:1992 - 1 kV Power Lines
0.5 kV Signal Lines

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC.

(1) The product was tested in a typical Hewlett Packard workstation configuration.

Exeter, April 30, 1996
Date


James Kelly
Quality and Engineering Manager

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department ZQ/Standards Europe, Herrenberger Strasse 130, D-71034 Boeblingen (FAX: +49-7031-143143)

Emissions Regulations

Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules and the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception (determined by turning the equipment off and on), you can correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Ask the dealer or an experienced radio/television technician for help.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and HP shielded cables, such as those you receive with your computer. Changes or modifications not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Operation of this device is subject to the following conditions:

- This device may not cause harmful interference.
- This device must accept interference received, including interference that may cause undesired operation.
- Cables used with this device must be properly shielded to comply with the requirements of the FCC.

VCCI CLASS 2

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づく第二種情報技術装置です。この装置は、家庭環境で使用することを目的としています。この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取り扱い説明書に従って正しい取り扱いをして下さい。

Emissions Regulations Compliance

Any third-party I/O device installed in HP system(s) must be in accordance with the requirements set forth in the preceding Emissions Regulations statements. In the event that a third-party noncompliant I/O device is installed, the customer assumes all responsibility and liability arising therefrom.

Acoustics

Regulation On Noise Declaration For Machines –3. GSGV

Lpa <70dB
operator position
normal operation
per ISO 7779

Lpa <70dB
am Arbeitsplatz
normaler Betrieb
nach DIN 45635 T.19

Electrostatic Discharge (ESD) Precautions

Electrostatic charges can damage the integrated circuits on printed circuit boards. To prevent such damage from occurring, observe the following precautions during board unpacking and installation:

- Stand on a static-free mat.
- Wear a static strap to ensure that any accumulated electrostatic charge is discharged from your body to ground.
- Connect all equipment together, including the static-free mat, static strap, routing nodes, and peripheral units.
- Keep uninstalled printed circuit boards in their protective anti-static bags.
- Handle printed circuit boards by their edges, once you have removed them from their protective antistatic bags.

Visible LEDs

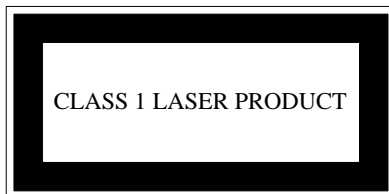
The Visible LED on this product is classified as “**Class 1 LED PRODUCT**” in accordance with **EN 60825-1**.

**Laser Safety
Statement (For
U.S.A. Only)**

(For workstations that have a CD ROM drive installed.)
The CD-ROM mass storage system is certified as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the *Radiation Control for Health and Safety Act* of 1968.

This means that the mass storage system does not produce hazardous laser radiation. Because laser light emitted inside the mass storage system is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

**IEC 825 Class 1
Laser Label**





Warnings and Cautions

WARNING:

Removing device cover may expose sharp edges in equipment chassis. To avoid injury, use care when installing customer add-on devices.

WARNUNG:

Das Entfernen der Geräteabdeckung legt die scharfen Kanten im Inneren des Gerätes frei. Um Verletzungen zu vermeiden, seien Sie vorsichtig beim Einbau von zusätzlichen Bauteilen, die vom Kunden selber eingebaut werden können.

AVERTISSEMENT:

Des bords tranchants du châssis de l'équipement peuvent être exposés quand le cache de l'unité n'est pas en place. Pour éviter des blessures, faire très attention lors de l'installation de modules supplémentaires par le client.

WARNING:

Disconnect power plug from wall outlet or power source before moving or removing the device, or installing add-on components.

WARNUNG:

Entfernen Sie die Stromzuführung von der Steckdose oder der Stromquelle bevor Sie das Gerät bewegen, abbauen, oder zusätzliche Bauteile installieren.

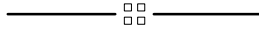
AVERTISSEMENT:

Débrancher la fiche de la prise de courant ou de la source d'alimentation électrique avant de déplacer ou de retirer l'unité, ou avant d'installer des modules supplémentaires.

WARNING:

Lithium batteries may explode if mistreated. Do not put lithium batteries in fires or try to recharge or disassemble them.

Replace battery only with Matsushita Electric BR-2325 three-volt lithium battery (HP part number 1420-0314)! Use of any other battery may cause fire or explosion.



Appendix B

Changing Your Workstation's Hardware Configuration

- Checking the SCSI IDs
- Opening the system unit
- Closing the system unit
- Installing removable media devices
- Adding a hard drive
- Installing additional memory
- Installing an EISA or graphics board
- Changing your monitor type

This appendix describes the procedures to change your workstation's hardware configuration.

The instructions in this appendix assume you are using the HP-UX version 10.20 or later operating system with the HP VUE version 3.0 interface.



CAUTION: Always wear a properly grounded wrist strap when reconfiguring your workstation.

Use the following tools to remove or replace hardware parts when changing your configuration:

- Light-duty flat blade screwdriver with 150 mm (6 in.) blade
- Number 1 Posi-drive driver
- T10, T15, and T20 Torx drivers
- Needlenose pliers

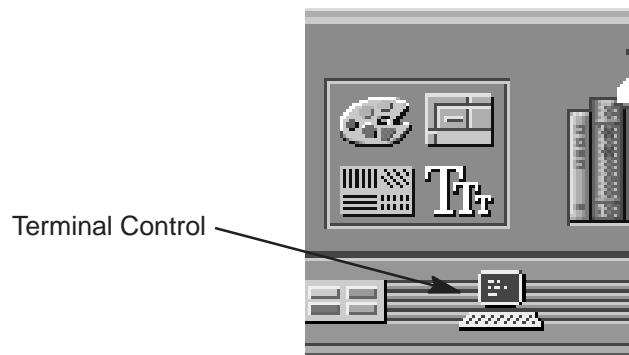
Also, read the ESD Precautions in Appendix A of this guide.

Checking the SCSI IDs

To determine which SCSI IDs are currently in use on your system, use the **ioscan** command in a terminal window:



1. Click on the **Terminal Control** on the **Front Panel** of your Workspace.



A terminal window opens.

2. Move the mouse cursor into the terminal window and single-click the left mouse button.
3. Enter the following at the prompt:

```
/usr/sbin/ioscan -f 
```

After a few moments the **ioscan** utility lists all of the SCSI I/O devices it could find. The list appears similar to the following:

Class	I	H/W Path	Driver	S/W State	H/W Type	Description
bc	0		root	CLAIMED	BUS_NEXUS	
bc	1	8	ccio	CLAIMED	BUS_NEXUS	I/O Adapter
ext_bus	0	8/0	c720	CLAIMED	INTERFACE	GSC built-in Fast/Wide SCSI Interface
target	0	8/0.0	tgt	CLAIMED	DEVICE	
disk	3	8/0.0.0	sdisk	CLAIMED	DEVICE	QUANTUM LPS1080WD
target	1	8/0.5	tgt	CLAIMED	DEVICE	
disk	2	8/0.5.0	sdisk	CLAIMED	DEVICE	DEC DSP3210SW
target	2	8/0.6	tgt	CLAIMED	DEVICE	
disk	0	8/0.6.0	sdisk	CLAIMED	DEVICE	DEC DSP3210SW
ba	0	8/12	bus_adapter	CLAIMED	BUS_NEXUS	Core I/O Adapter
ext_bus	2	8/12/0	CentIf	CLAIMED	INTERFACE	Built-in Parallel Interface
audio	0	8/12/1	audio	CLAIMED	INTERFACE	Built-in Audio
tty	0	8/12/4	asio0	CLAIMED	INTERFACE	Built-in RS-232C
ext_bus	1	8/12/5	c700	CLAIMED	INTERFACE	Built-in SCSI
target	3	8/12/5.2	tgt	CLAIMED	DEVICE	
disk	1	8/12/5.2.0	sdisk	CLAIMED	DEVICE	TOSHIBA CD-ROM XM-4101TA
target	4	8/12/5.3	tgt	CLAIMED	DEVICE	
tape	0	8/12/5.3.0	stape	CLAIMED	DEVICE	HP HP35480A
target	5	8/12/5.4	tgt	CLAIMED	DEVICE	
disk	10	8/12/5.4.0	sdisk	CLAIMED	DEVICE	SEAGATE ST3600N
target	6	8/12/5.6	tgt	CLAIMED	DEVICE	
disk	5	8/12/5.6.0	sdisk	CLAIMED	DEVICE	MICROP 2112
lan	0	8/12/6	lan2	CLAIMED	INTERFACE	Built-in LAN
ps2	0	8/12/7	ps2	CLAIMED	INTERFACE	Built-in Keyboard/Mouse
bc	2	10	ccio	CLAIMED	BUS_NEXUS	I/O Adapter
graphics	0	10/0	graph3	CLAIMED	INTERFACE	Graphics
graphics	1	10/8	graph3	CLAIMED	INTERFACE	Graphics
ext_bus	3	10/12	c720	CLAIMED	INTERFACE	GSC add-on Fast/Wide SCSI Interface
target	7	10/12.4	tgt	CLAIMED	DEVICE	
disk	6	10/12.4.0	sdisk	CLAIMED	DEVICE	SEAGATE ST31200W
graphics	2	10/16	graph3	CLAIMED	INTERFACE	Graphics
ba	1	10/20	bus_adapter	CLAIMED	BUS_NEXUS	Core I/O Adapter
tty	1	10/20/2	asio0	CLAIMED	INTERFACE	Built-in RS-232C
ba	2	10/20/5	eisa	CLAIMED	BUS_NEXUS	EISA Bus Adapter
ext_bus	4	10/20/5/3	hshpib	CLAIMED	INTERFACE	EISA card HWP0C70
target	8	10/20/5/3.0	tgt	CLAIMED	DEVICE	
disk	7	10/20/5/3.0.0	cs80	CLAIMED	DEVICE	disk 07959
target	9	10/20/5/3.1	tgt	CLAIMED	DEVICE	
disk	8	10/20/5/3.1.0	cs80	CLAIMED	DEVICE	disk 07959
target	10	10/20/5/3.2	tgt	CLAIMED	DEVICE	
disk	9	10/20/5/3.2.0	cs80	CLAIMED	DEVICE	disk 07959
processor	0	32	processor	CLAIMED	PROCESSOR	Processor
memory	0	49	memory	CLAIMED	MEMORY	Memory

4. You can determine which SCSI IDs are currently in use by looking under the **H/W Path** heading. The J2240 lists **8/4/19/0** as the built-in SCSI bus controller. For devices connected to the built-in SCSI bus, such as disks, the fourth number is the SCSI ID for that device. For example, the listing **8/4/19/0.6.0** tells you that there is a SCSI device (a disk) currently using ID 6 on the SCSI bus.



NOTICE: Never use SCSI address 7 for any device. Address 7 is reserved for the SCSI controller.

Opening the System Unit



Perform the following steps to open the system unit:

- 1.** Power off the system, the monitor, and any peripheral devices. Unplug the system unit power cord and the power cord of any peripheral devices from ac wall outlets. Refer to *Using Your HP Workstation* for the proper method of shutting down your workstation.
- 2.** Attach the static-grounding wrist strap by following the instructions on the package. Attach the sticky end of the wrist strap to bare metal on the back panel of the system unit.
- 3.** Press down on the two buttons on the top front of the workstation, releasing the front panel (also known as the front bezel) as shown in Figure B-1.

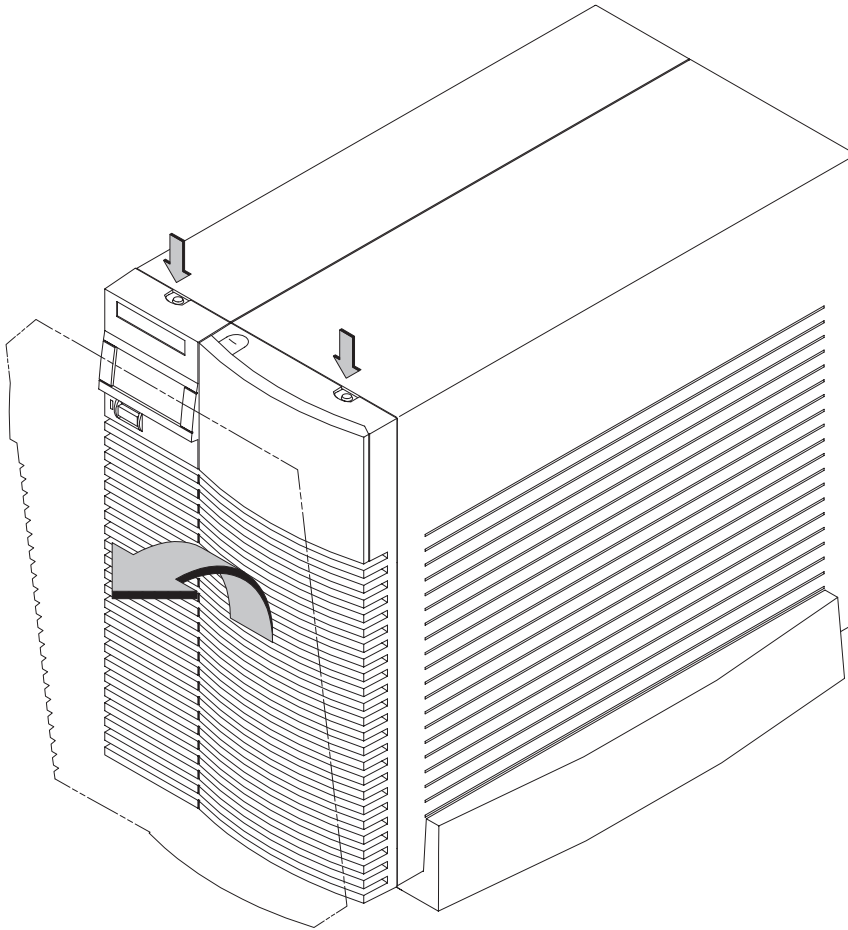


Figure B-1. Removing the Front Panel

- 4.** Swing the panel down and pull up slightly so the two guide pins on the bottom clear their guides and lay the front cover down.

Closing the System Unit



Perform the following steps to close the system unit:

CAUTION: Do not attempt to operate the workstation with the front cover removed. The cover is needed for proper air flow for system cooling.



1. Insert the two guide pins on the bottom of the front cover into the guides on the bottom of the system unit.
2. Swing the front cover up, and push it firmly into the workstation housing. The front panel edges automatically align with the workstation housing, and the top latch buttons pop up into position. See Figure B-2.



NOTICE: To maintain FCC/EMI compliance, verify that the top latches snap completely into position.

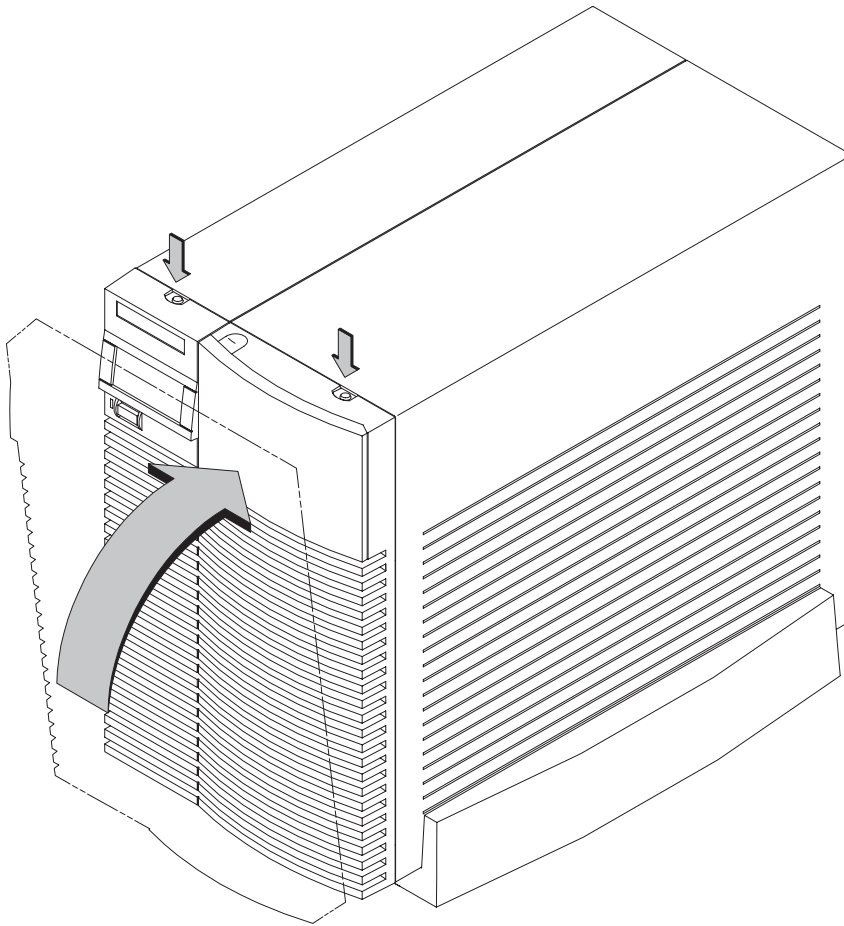


Figure B-2. Replacing the Front Panel

- 3.** Reconnect the power cables and any other cables that you disconnected when opening the workstation, then power on any peripherals, the monitor, and the system unit.

Installing Removable Media Devices

Your workstation can have any two of the following removable media devices, with no two the same:

- CD-ROM drive
- 2 to 8 GB, 4 mm DDS tape drive
- 3.5-inch Floppy disk drive

Follow these steps for installing any of the removable media drives into the Storage Assembly. The steps for checking and setting drive jumpers are different for each drive. Jumper information for each drive is included in these steps.



NOTICE: Before opening the system unit, follow the instructions in “Checking the SCSI IDs,” earlier in this appendix, to determine the SCSI IDs currently in use on your workstation.



1. Open the system unit according to the directions in “Opening the System Unit,” earlier in this appendix.
2. Unscrew the two captive screws on the left side of the Storage Assembly and pull down the drawer ejector handle on the right side of the Storage Assembly, as shown in Figure B-3.

The Storage Assembly slides partway out of the drawer.

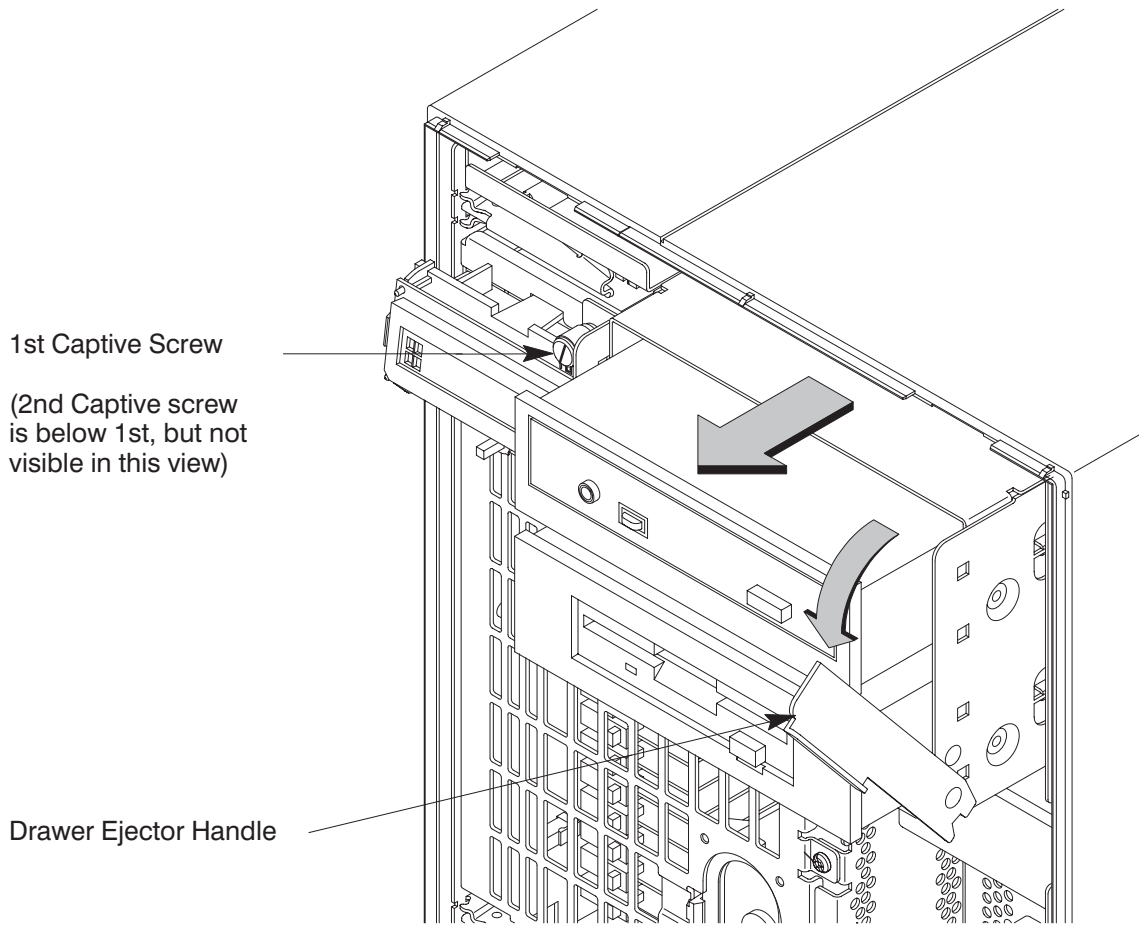


Figure B-3. Removing Storage Drawer from System Unit

3. Pull the Storage Assembly out as far as it will go. (A safety catch prevents the drawer from coming all the way out.)



NOTICE: When sliding the Storage Assembly out of the system unit, move the drawer ejector handle to prevent the Storage Assembly from hitting it.

4. Push in on the safety catch and continue pulling the drawer out. Be sure to support the drawer from the bottom.

5. Set the drawer on a flat surface.
6. Disconnect the power distribution cable from the Fan extender cable.

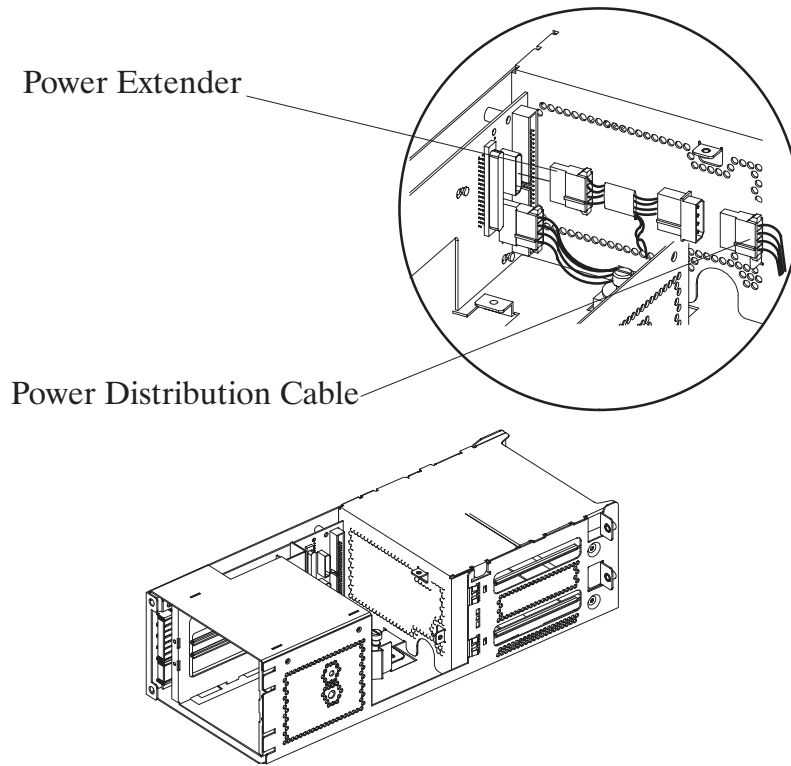


Figure B-4. Removing FAN from EMI Plate

7. Disconnect the Fan extender cable form the SCSI PCA.

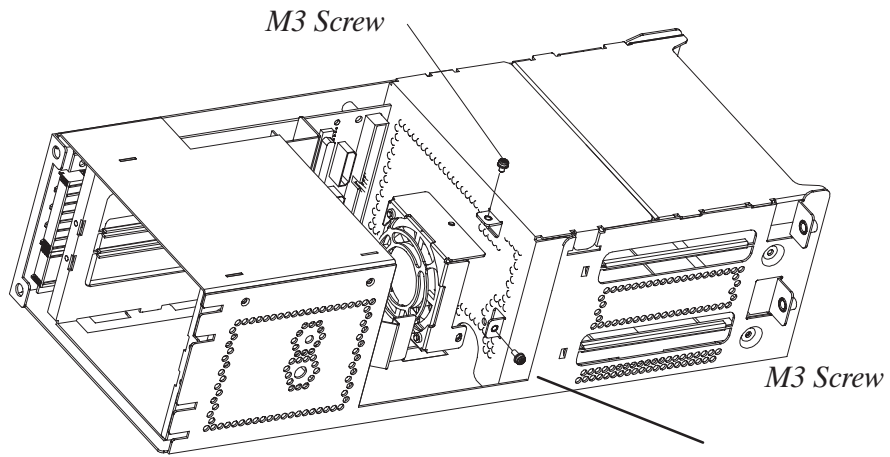


Figure B-5. Removing EMI Plate

- 8.** Remove the two M-3 screws from the fan.

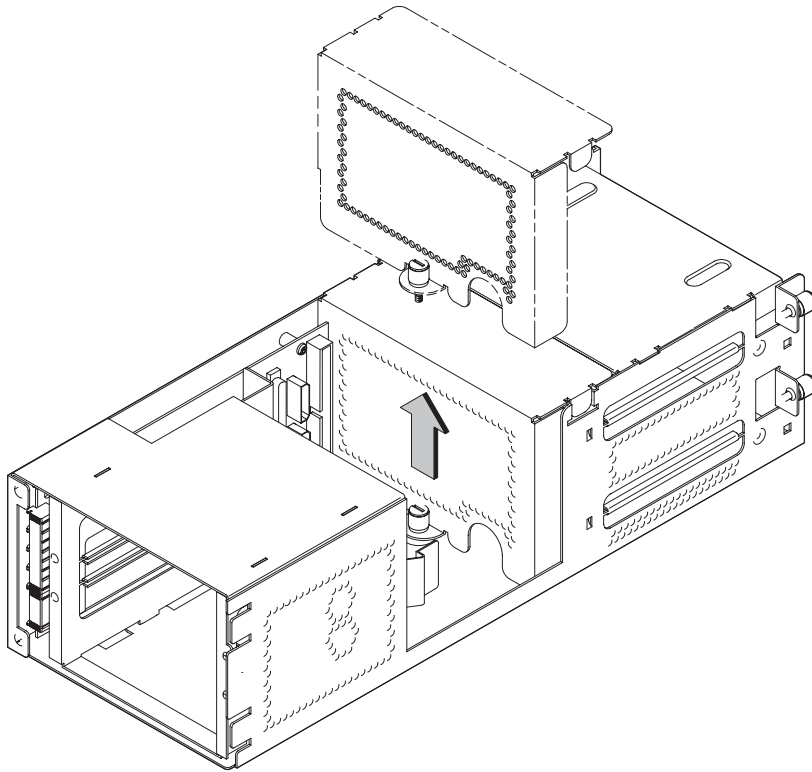


Figure B-6. Removing FAN/EMI Plate

- 9.** Unscrew the captive screw holding the FAN/EMI plate at the back of the removable drives and lift the plate up and out of the drawer, as shown in Figure B-6.
- 10.** Disconnect the SCSI and power cables from the drive.

- 11.** Unscrew the two screws holding the drive in the storage drawer, and slide the drive out of the drawer. See Figure B-7.

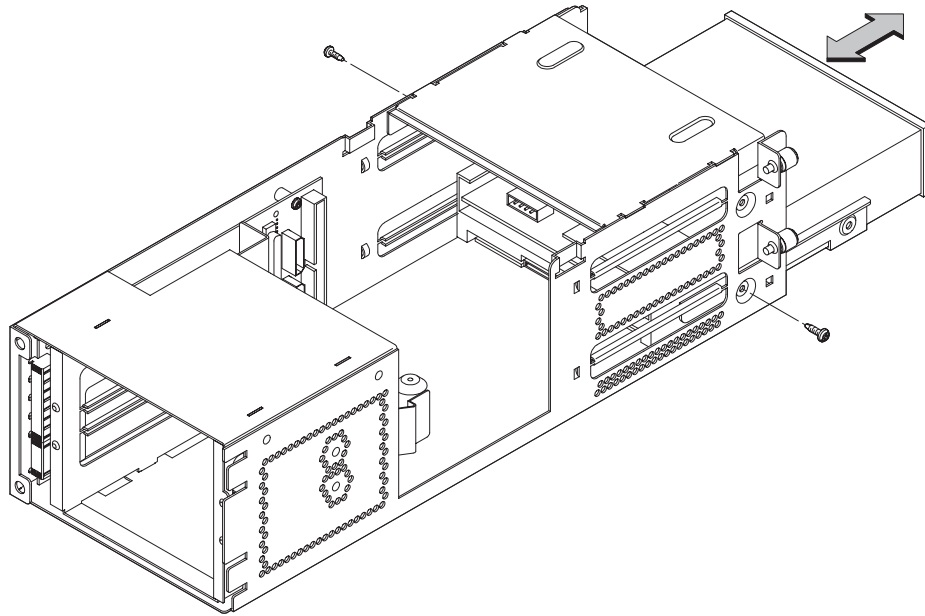


Figure B-7. Removing Drive Screws

- 12.** Check the SCSI address/jumper settings on the replacement drive, using the following information sections.

CD-ROM Drive

The CD-ROM drive ships with the drive set to SCSI ID address 2. We recommend keeping the address setting at 2 unless it is used by another device.



CAUTION: CD-ROM drives are susceptible to mechanical and electrostatic shock. When handling the drive, always wear the static-grounding wrist strap that came in the CD-ROM drive kit. Always handle the drive carefully.

If you need to change the CD-ROM drive's address, follow these instructions, referring to Figure B-8. If you do not need to change the drive's address, go to Step 10 of this installation procedure.

1. Locate the jumpers at the back of the CD-ROM drive.
2. To change the address, use needlenose pliers to set the drive's SCSI ID to an address that is not used by another SCSI device. Check that the other jumpers are set correctly.



NOTICE: Do not use SCSI ID 7 for your CD-ROM drive's SCSI address. The host SCSI controller uses SCSI ID 7.

3. Use needlenose pliers to remove the SCSI terminators, if still attached to the drive.

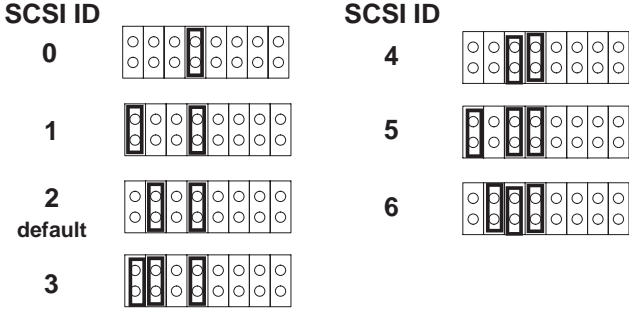
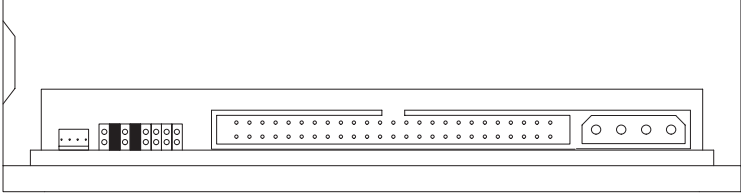


Figure B-8. CD-ROM Drive SCSI Address/Jumper Settings

DDS Tape Drive

The DDS tape drive ships with the drive set to SCSI ID address 3 and the Operation Mode switches set for correct drive operation. We recommend keeping the address setting at 3 unless it is used by another device.



CAUTION: SCSI tape drives are susceptible to mechanical and electrostatic shock. When handling the drive, always wear the static-grounding wrist strap that came in the DDS tape drive kit. Always handle the drive carefully.

If you need to change the DDS tape drive's address or operation mode, follow these instructions, referring to Figure B-9 for the DDS-DC drive, Figure B-10 for the DDS-2 drive, and Figure B-11 for operation mode. If you do not need to change the drive's address or operation mode, go to Step 10 of this installation procedure.

1. Locate the jumpers at the back of the DDS tape drive.
2. To change the jumper settings, use needlenose pliers to set the drive's SCSI ID to an address that is not used by another SCSI device. Check that the other jumpers are set correctly.



NOTICE: Do not use SCSI ID 7 for your DDS tape drive's SCSI address. The host SCSI controller uses SCSI ID 7.

3. Use needlenose pliers to remove the SCSI terminators, if still attached to the drive.
4. If you need to change the Operation Mode switches, locate the switches on the underside of the DDS tape drive. Switches 1 and 2 are used to configure the data compression operation mode. Switches 3 through 8 are used to specify drive connectivity and functionality according to host or customer requirements. The default setting is all switches ON. Figure NO TAG shows the available options.

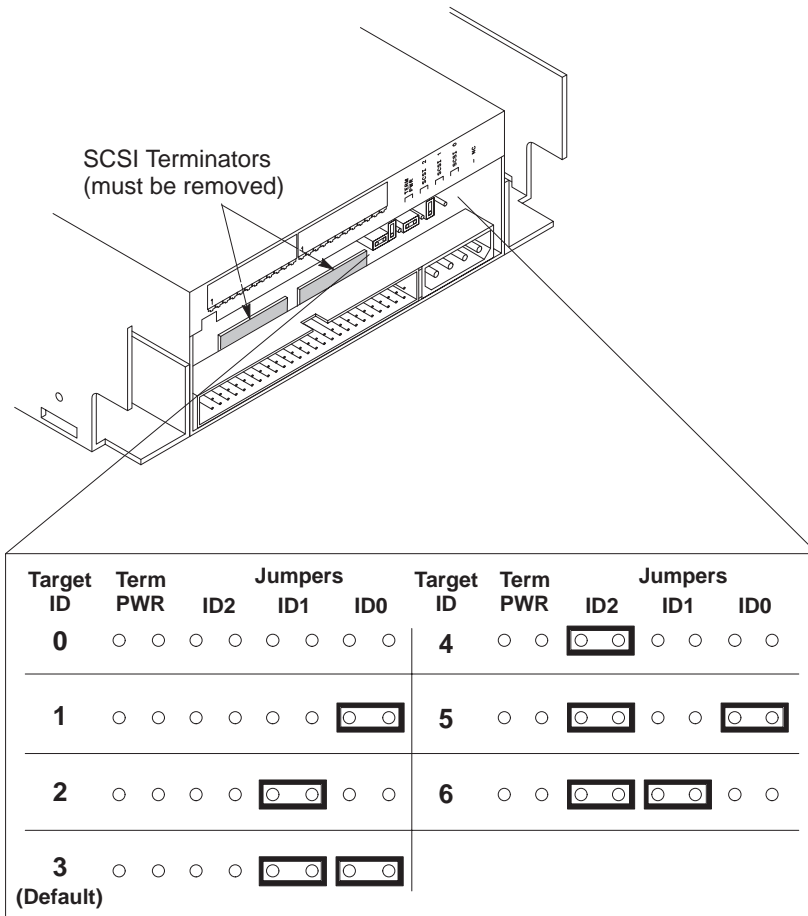
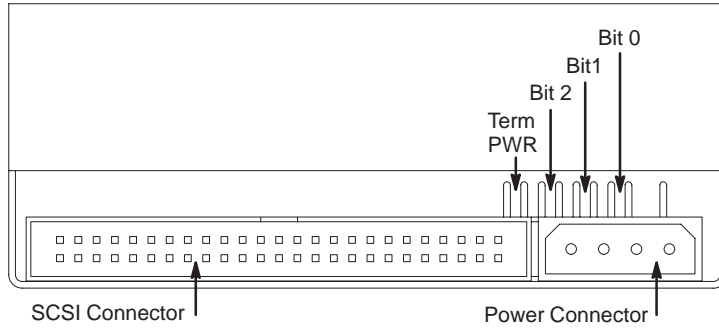


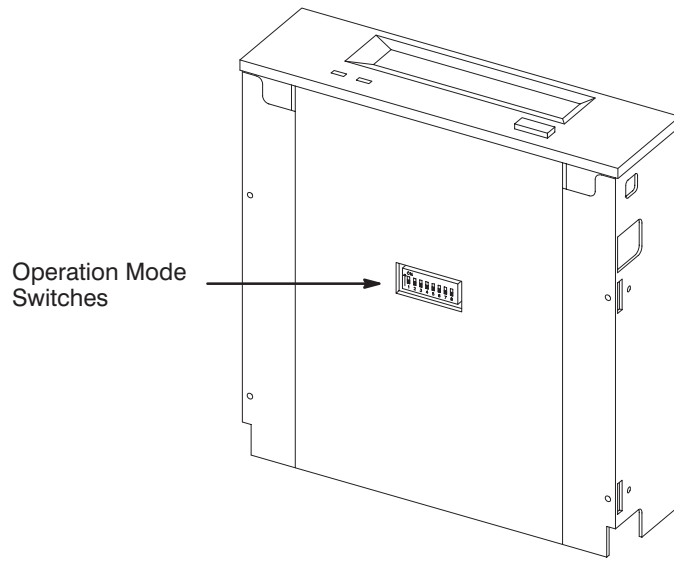
Figure B-9. DDS-DC Tape Drive SCSI Address/Jumper Settings



SCSI ID	Term PWR*	Bit 2	Bit 1	Bit 0	SCSI ID	Term PWR*	Bit 2	Bit 1	Bit 0
0	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	4	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>
1	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	5	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>
2	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/>	6	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input type="radio"/> <input type="radio"/>
3 (Default)	<input type="radio"/> <input type="radio"/>	<input type="radio"/> <input type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>	<input checked="" type="radio"/> <input checked="" type="radio"/>					

*Term PWR is not used in HP workstation configurations.

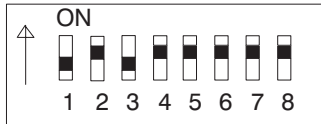
Figure B-10. DDS-2 Tape Drive and SCSI Address/Jumper Settings



Compression Disabled,
No Host Control



Compression Enabled,
No Host Control



Compression Disabled, Host
Can Control Compression



Compression Enabled,
With Host Control
Default Setting

Figure B-11. Switch Settings for Data Compression Operation Mode

Floppy Drive

The floppy disk drive ships with the drive set to SCSI ID address 0. We recommend keeping the address setting at 0 unless it is used by another device.



CAUTION: Floppy disk drives are susceptible to mechanical and electrostatic shock. When handling the drive, always wear the static-grounding wrist strap that came in the floppy disk drive kit. Always handle the drive carefully.

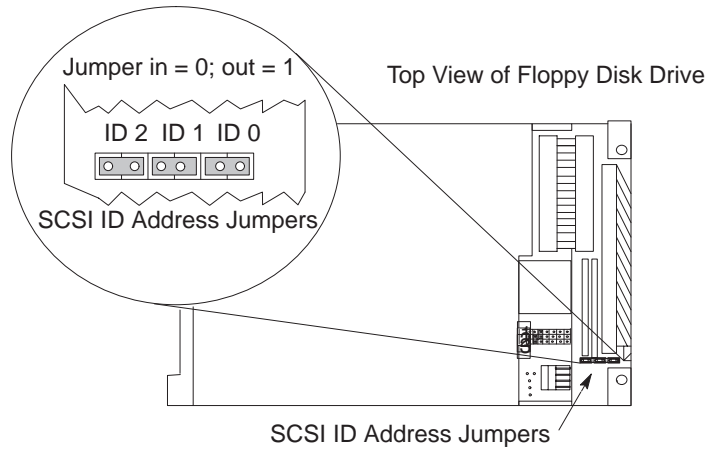
If you need to change the floppy disk drive's address, follow these instructions, referring to Figures B-12 and B-13. If you do not need to change the drive's address, go to Step 10 of this installation procedure.

1. Locate the jumpers on the top of the floppy drive.
2. To change the jumpers, use needlenose pliers to set the drive's SCSI ID to an address that is not used by another SCSI device. Check that the other jumpers are set correctly.



NOTICE: Do not use SCSI ID 7 for your floppy drive's SCSI address. The host SCSI controller uses SCSI ID 7.

3. Use needlenose pliers to remove the SCSI terminators, if still attached to the drive.



SCSI ID Address	Jumpers		
	ID 2	ID 1	ID 0
0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure B-12. Floppy Drive SCSI Address/Jumper Settings

Top View of Floppy Disk Drive

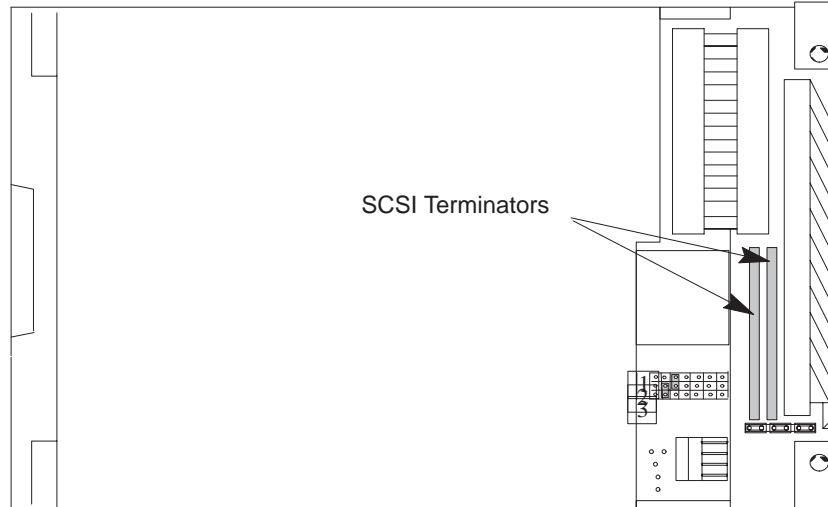


Figure B-13. Floppy Drive Terminators

- 13.** Figure B-14 shows the orientation of each of the removable media drives in the bracket and the position of the screws holding the drive bracket in place. The same bracket can be used on all three drives.

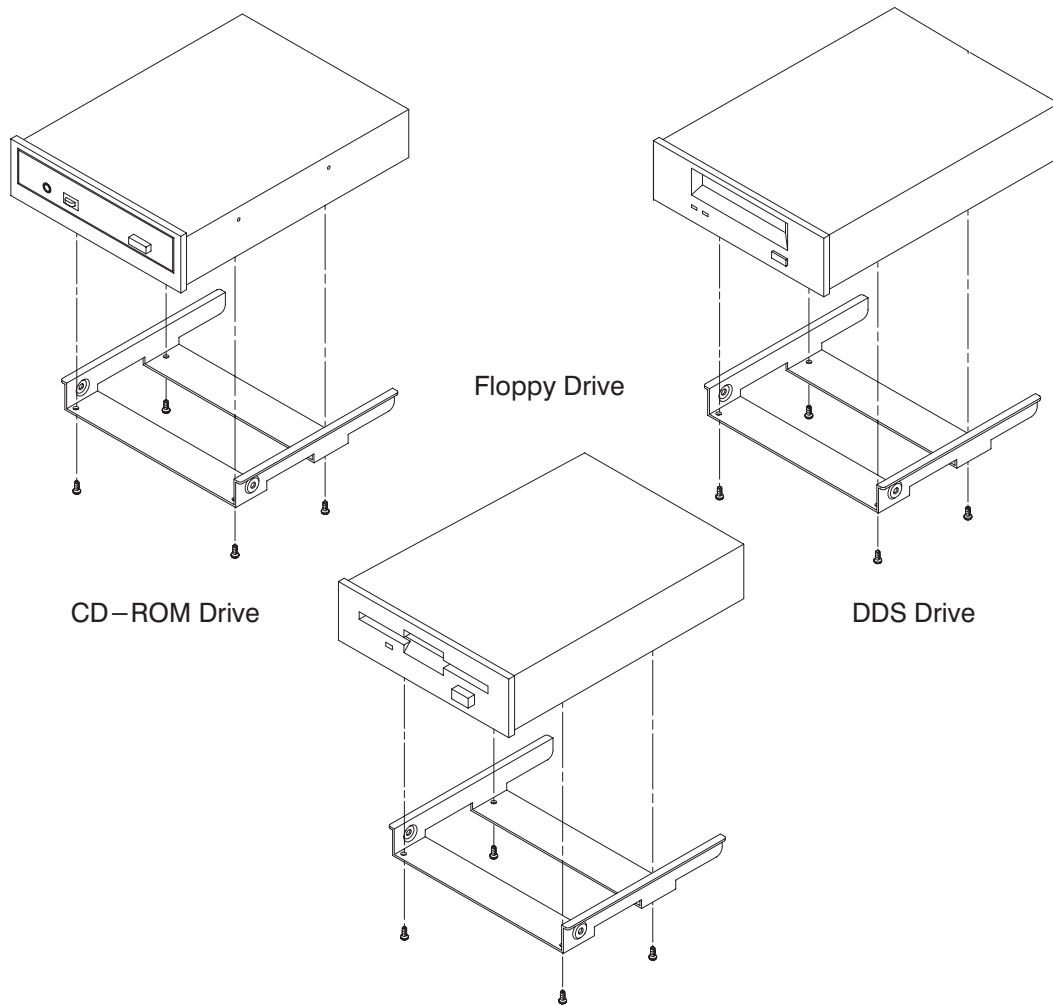


Figure B-14. Attaching Removable Drive Mounting Bracket and Drive Orientation

14. With the disk mounting bracket between the guides on each side of the Storage Assembly, slide the disk into the Storage Assembly, securing it with the two side screws. See Figure B-15. Do not over-tighten the side screws.

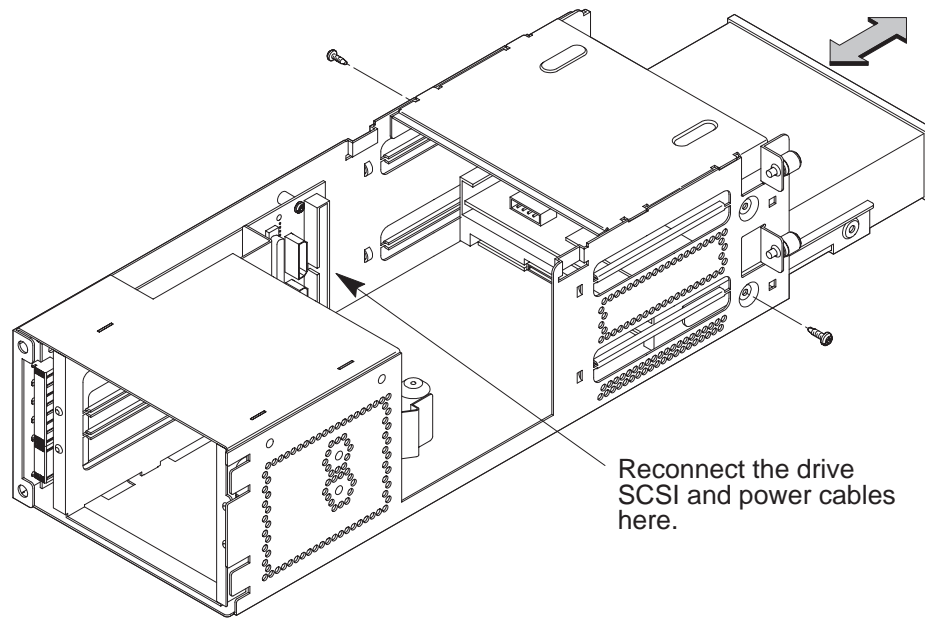


Figure B-15. Replacing Drive Screws

15. Reconnect the cabling from the back of the drive to the side of the drawer assembly. See Figure NO TAG.
16. Secure the EMI plate at the back of the removable drives with the captive screw in the bottom of the plate.
17. Slide the drawer back in.

18. Push the drawer ejector handle up until the Storage Assembly slides all the way into the system unit and secure the two captive screws on the left of the Storage Assembly, as shown in Figure B-16.



NOTICE: If the ejector handle is not pushed completely in, you may not have proper seating of the SCSI PCB interconnect to the backplane.

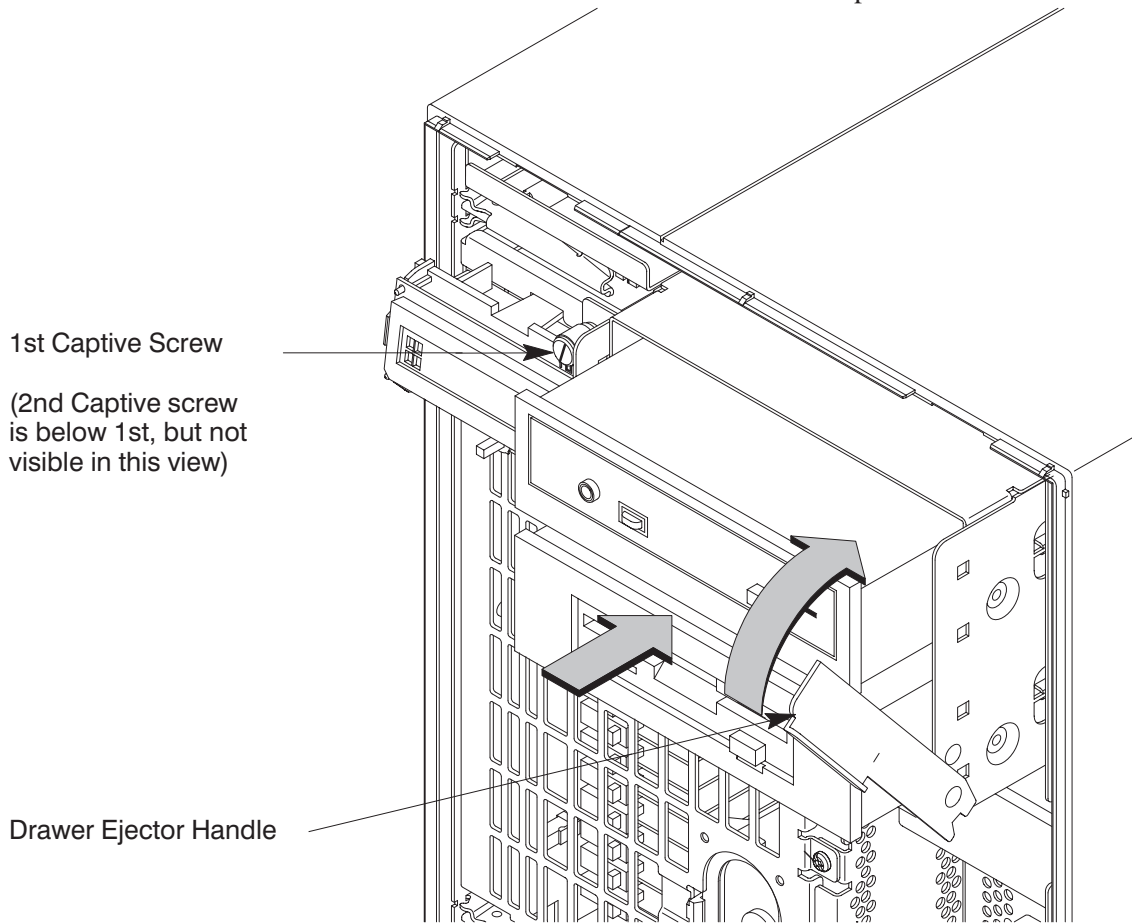


Figure B-16. Replacing the Storage Drawer Assembly

- 19.** Follow the instructions in “Checking the SCSI IDs” earlier in this appendix, to verify that your workstation can see the newly installed drive.

For information about using your drives see the following chapters in this book:

- Using your CD-ROM drive is in Chapter 3.
- Using your DDS tape drive is in Chapter 4.
- Using your floppy drive is in Chapter 5.

Adding a Hard Drive

This section describes how to add a hard drive to your workstation. The first part deals with installing a hard drive and the second part tells you how to configure your hard disk after it is installed.

Your workstation can have two hard drives. The hard drive that came with your workstation was set to SCSI ID 6. If you are adding a second hard disk, the second hard disk will use SCSI ID 5. If another device on your workstation is using SCSI ID 5, change the hard disk's SCSI ID to an unused SCSI ID.



NOTICE: Do not use SCSI ID 7 for your hard drive's SCSI address. The host SCSI controller uses SCSI ID 7. If you are adding a second hard drive, we advise you not to use SCSI ID 6 which is normally reserved for the boot disk drive.

Check the jumpers on the hard drive you plan to install. Figure B-17 shows the correct SCSI address for the jumpers on your drive. These jumpers are the only jumpers you may need to change on the drive.

1. Use a pair of small needle-nose pliers to set the SCSI ID jumpers to SCSI ID 5 if you are adding a second hard drive, or SCSI ID 6 if this is the first hard drive (you are running diskless). Check that the other jumpers are set correctly.
2. If you removed the disk drive mounting bracket from the disk drive, replace it now, making sure not to over-tighten the screws. Figure B-18 shows the orientation of the drive in the bracket for both drives and the position of the screws holding the drive bracket in place.

Be sure the printed circuit side of one drive is facing the printed circuit side of the other drive.

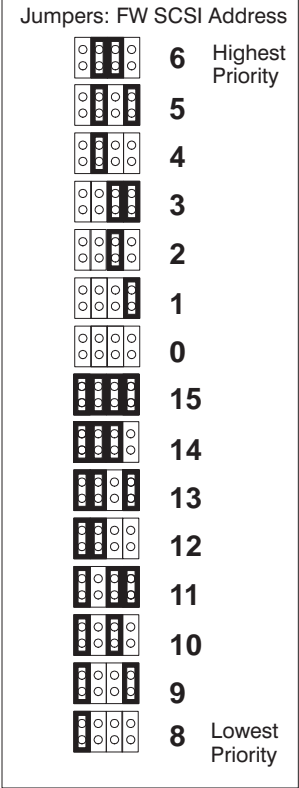


Figure B-17. Typical Hard Drive Jumper Settings

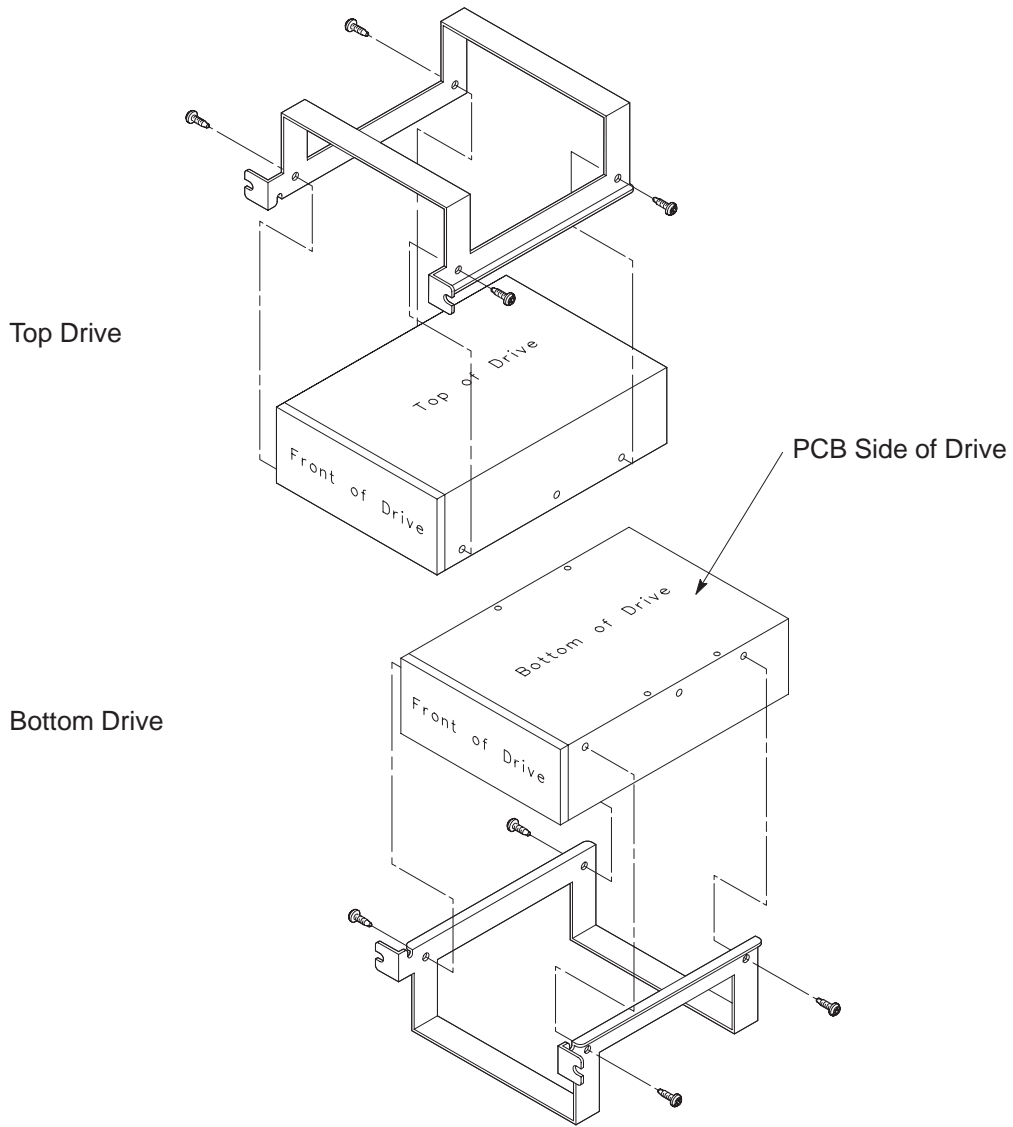


Figure B-18. Replacing Hard Drive Mounting Bracket and Drive Orientation

Installing a Hard Disk Drive

Perform the following steps to install a hard disk drive.



NOTICE: Before opening the system unit, follow the instructions in “Checking the SCSI IDs,” earlier in this appendix, to determine the SCSI IDs currently in use on your workstation.



- 1.** Open the system unit according to the directions in “Opening the System Unit,” earlier in this appendix.
- 2.** Unscrew the two captive screws on the left side of the Storage Assembly and pull down the drawer ejector handle on the right side of the Storage Assembly, as shown in Figure B-19.

The Storage Assembly slides partway out of the drawer.

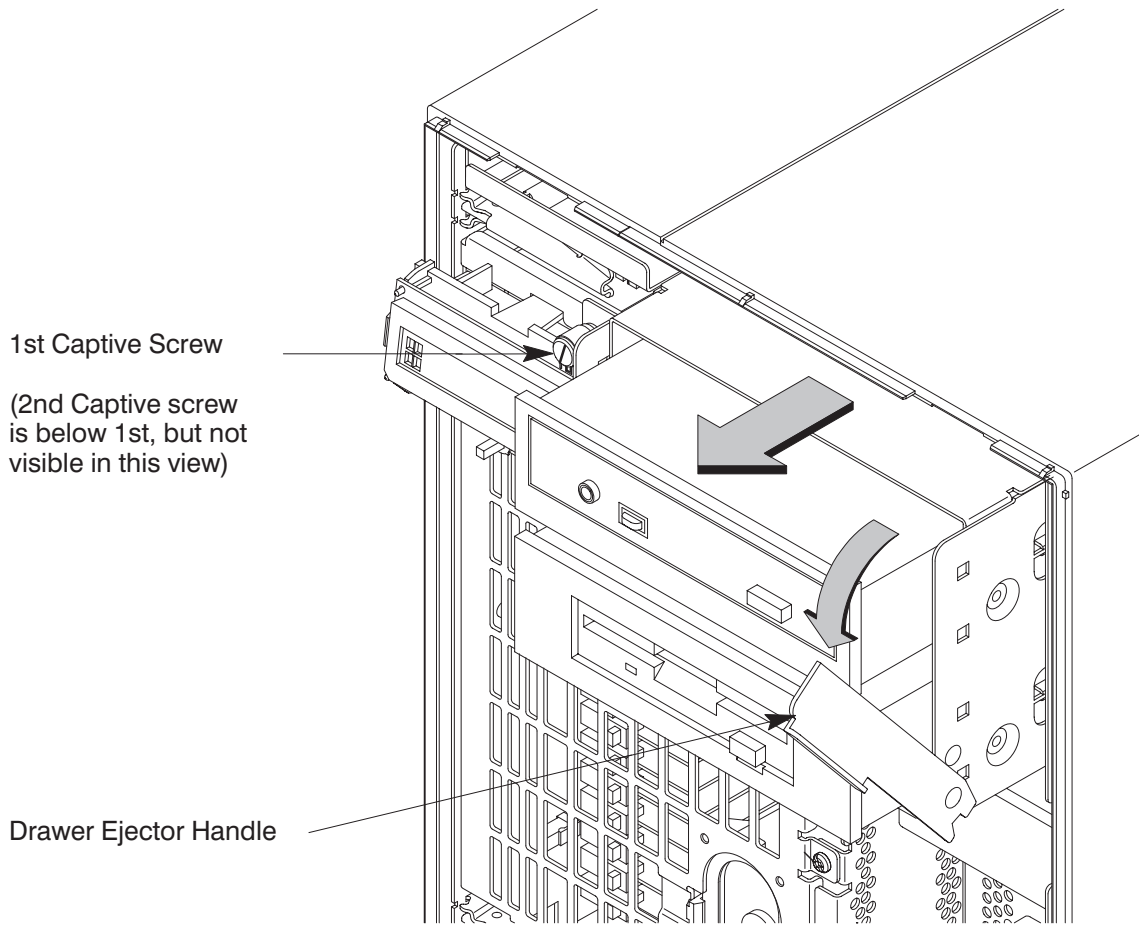


Figure B-19. Removing Storage Drawer from System Unit

- 3.** Pull the Storage Assembly out as far as it will go. (A safety catch prevents the drawer from coming all the way out.)



NOTICE: When sliding the Storage Assembly out of the system unit, move the drawer ejector handle to prevent the Storage Assembly from hitting it.

- 4.** Press in on the safety catch on each side of the drawer to allow the drawer all the way out and place the drawer on a flat surface.

5. Be sure you have already checked the SCSI ID of the drive you want to install using the method described at the beginning of this section.
6. With the disk mounting bracket between the guides on each side of the Storage Assembly, slide the disk into the Storage Assembly, securing it to the drawer with two side screws. See Figure B-20. Do not over-tighten the side screws.

The drives should be placed in the drive bays with the bottom of each drive toward the middle, as shown in Figure B-20. Refer to Figure B-18 for drive orientation in the bracket.

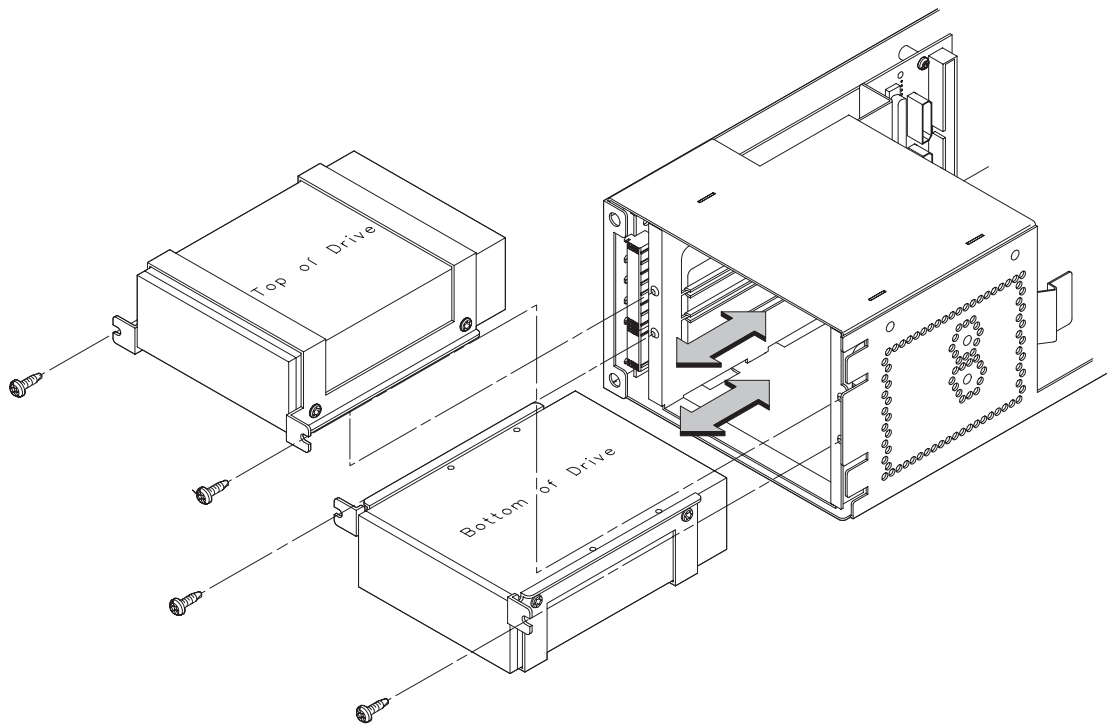


Figure B-20. Placing Hard Drives in Storage Drawer

7. Reconnect the SCSI and power cables from the back of the drive to the side of the drawer assembly.
8. Slide the drawer back in and secure.
9. Close the system unit and reconnect all cables as described in the “Closing the System Unit” section in this appendix.
10. Follow the instructions in the “Checking the SCSI IDs” subsection to verify that your workstation can see the hard drive.

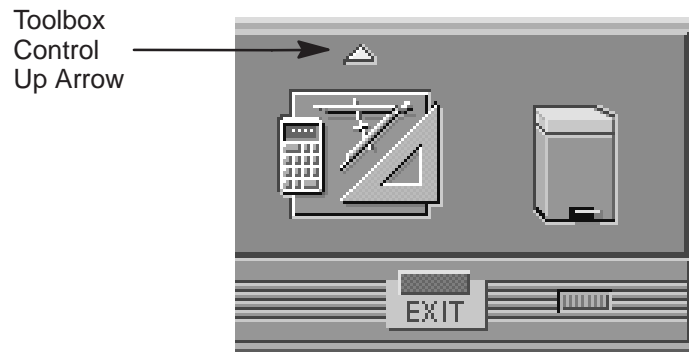
Configuring a Hard Drive

This section describes how to add a hard disk drive to your system as a file system using SAM. For more information about configuring a hard disk drive, refer to the *System Administration Tasks* manual.

The procedures in this chapter require you to log in as **root**. If you cannot log in as **root**, contact your system administrator.



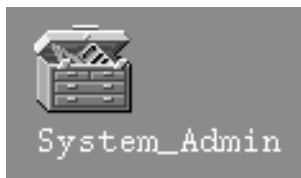
1. Log in as **root**.
2. Move the mouse pointer to the **up arrow** above the **Toolbox** control and click the left mouse button.



3. The **Toolbox** subpanel opens. Click on the **General** toolbox icon, shown below.



4. A file manager window appears with a number of icons in it. Double-click on the **System_Admin** toolbox icon.



SAM (System Administration Manager) is a utility that performs system administration tasks using a windows graphical user interface.

5. Move the mouse cursor to the **SAM** icon shown below (your icon can look like either of these) and double-click the left mouse button.



6. The **System Administration Manager** window opens. Double-click on **Peripheral Devices** ->.
7. The **Peripheral Devices** window opens. Double-click on **Disks and File Systems** ->.
8. The **Disks and File Systems** window opens. Double-click on **CD-ROM, Floppy, and Hard Disks**.

The following screen message appears:

```
Scanning the system's hardware...
```

The **CD-ROM, Floppy, and Hard Disks** window opens containing a list of drives currently configured on this system.

9. From the **Actions** menu, click on **Add a Hard Disk Drive**.
10. The **Select a Disk to Add...** window opens with a list of unused disks. Highlight the hard disk drive you want to add to your system.
11. Click on .
12. The **Set Disk Usage and Options...** window opens. Select **File System** and click on .
13. The following screen messages appear:

```
Task started.
```

```
Creating the device file...
```

```
Modifying "/etc/checklist"...
```

```
Task completed.
```

Click on .

Installing Additional Memory

Take a moment to read over the following important notes about installing memory:

- Before trying to install additional memory DIMMs in your J282/2240 workstation, use the procedure described in Appendix D, “The Boot Console Interface,” to determine the current memory configuration for this workstation.
- Read over the steps involved in installing memory DIMMs before you begin.
- DIMMs must be inserted in the order shown. Refer to Figure B–24.
- You must insert DIMMs in pairs of equal size.
- Be aware that it is possible to insert the DIMMs backwards into the connectors. Be sure therefore, that you understand the proper orientation for DIMMs going into the connectors. See Figure B–25.
- When you have finished installing additional DIMMs, use the Boot Console Interface to verify that they are seen by the workstation.

Perform the following steps to add memory DIMMs to your workstation. Note the instructions in Step 8 of this section on DIMM configuration before beginning these steps.



1. Open the system unit according to the directions in the “Opening the System Unit” section earlier in this appendix.
2. Remove the two screws in the center of the CPU Assembly.
3. Release the ejector tabs on the left side, top and bottom of the CPU Assembly. Refer to Figure B–21.

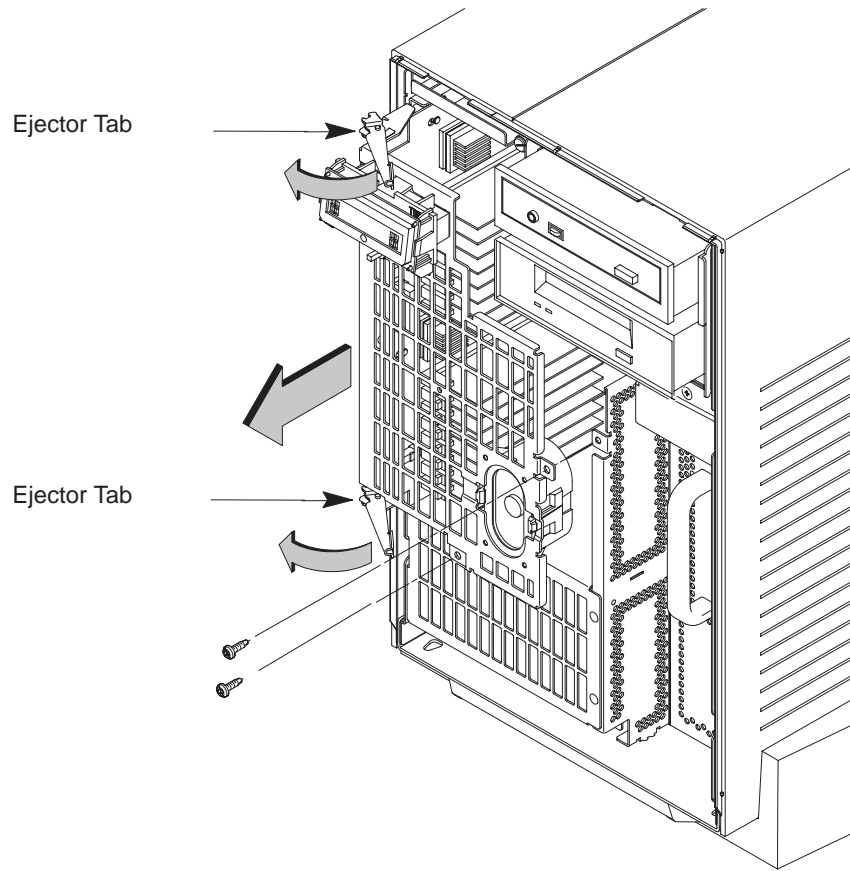


Figure B-21. Removing the CPU Assembly

4. Pull the CPU Assembly straight out and place on a flat surface with an antistatic mat.



NOTICE: The CPU Assembly is heavy, very warm and has no safety catch. Be sure to pull it out slowly, making sure it is properly supported.

5. Use Figure B-22 to locate the memory DIMMs on the CPU Assembly.

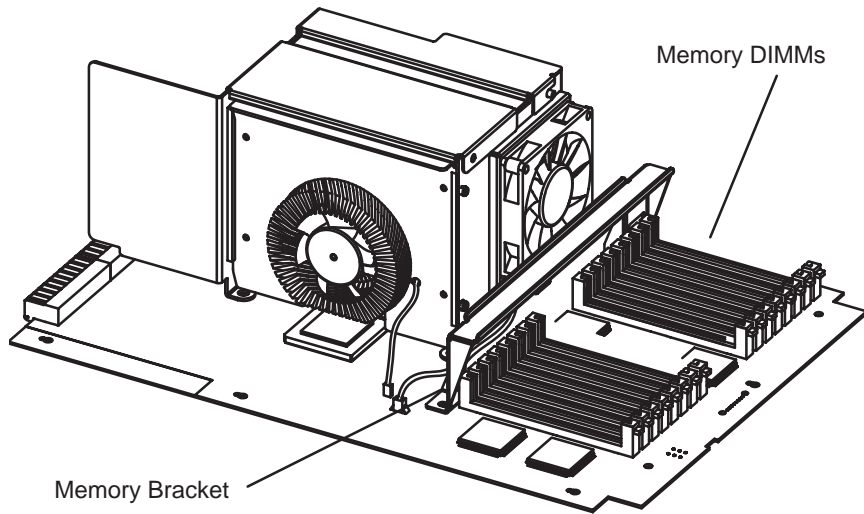


Figure B-22. Memory Retention Bracket and Memory DIMM Location



NOTICE: When installing DIMMs you need to orient the notch toward the white ejector handles.

6. To install a new memory DIMM, turn the CPU assembly until the memory DIMMs are in the position shown in Figure B-23.

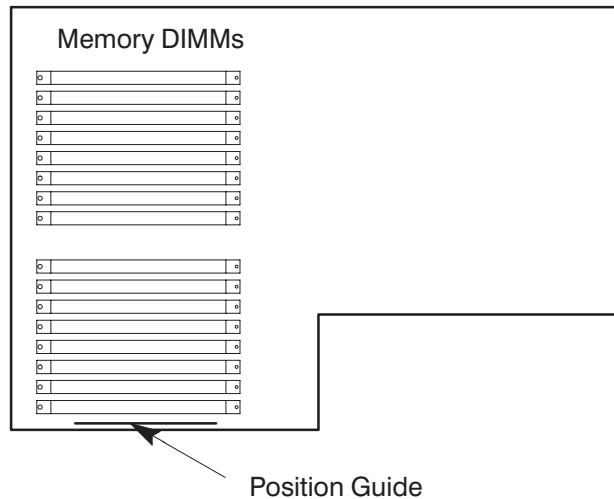


Figure B-23. CPU Assembly Orientation

7. Refer to the Position Guide on the CPU board that states, “<— POSITION MEM MODULE AS SHOWN,” as shown in Figure B-23.
8. Install pairs of DIMMs in the following order: Pair 1 (0A, 0B), Pair 2 (1A, 1B), Pair 3 (2A, 2B), and so on.

This workstation has 16 memory slots, labeled 0A, 0B through 7A, 7B. Memory DIMMs must be installed in pairs of equal size, with the largest pairs installed first, followed in order from largest to smallest pairs. Figure B-24 gives the recommended order for installing pairs of DIMMs.

Any Combination of memory may be used, although, for maximum performance, we recommend using common-sized memory DIMMs; for example, either all 128 MB, 256 MB, or 512 MB DIMM pairs. Therefore, to achieve both maximum performance

and maximum future capacity, use 512 MB DIMM pairs exclusively.

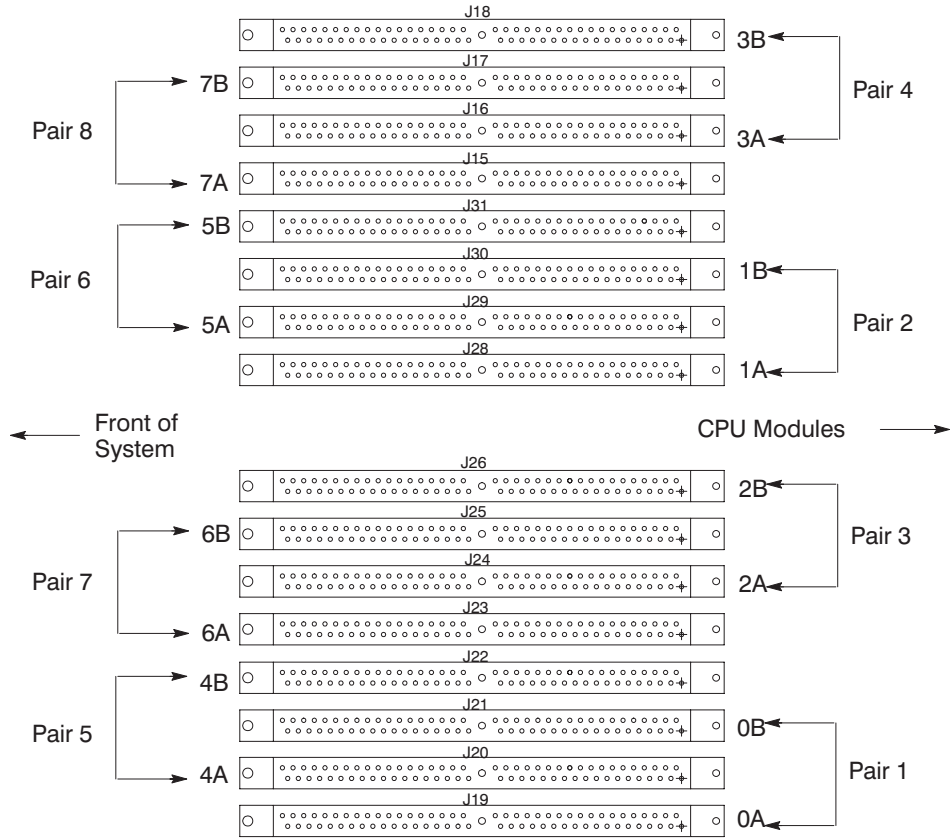


Figure B-24. Memory DIMM Sequence

9. Open the ejector tab by pressing down on it at the left of the connector. Refer to Figure B-25.

10. Place the DIMM in the connector, lining it up with the guides. Make sure to put the notched end toward the white ejector handle (to the left).

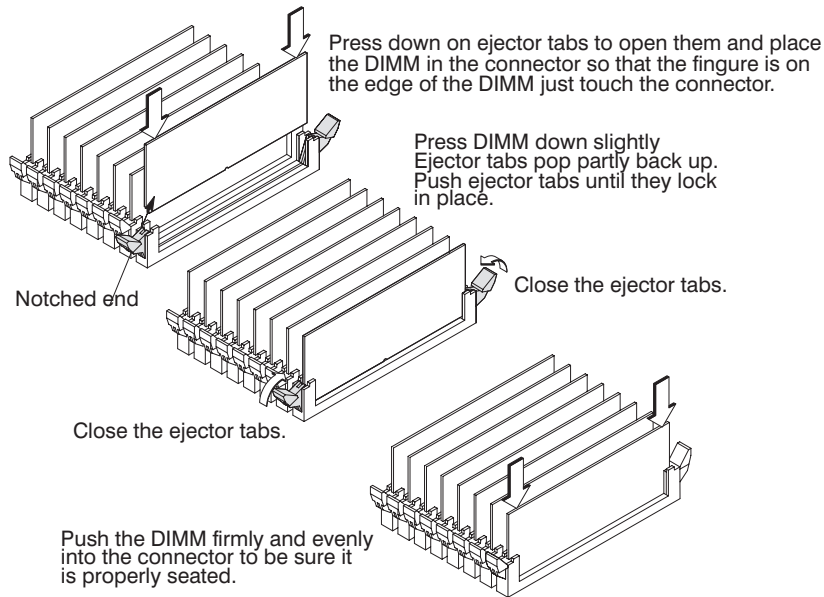


Figure B-25. Installing Memory Cards

11. Close the ejector tab.
12. Press firmly and evenly on the DIMM to ensure that it seats properly.
13. To replace the CPU Assembly in the system unit, first align the top of the CPU Assembly with the guide on the system unit. Refer to Figure B-26 and to the label on the back of the assembly. Be sure to support the CPU Assembly properly while replacing it.

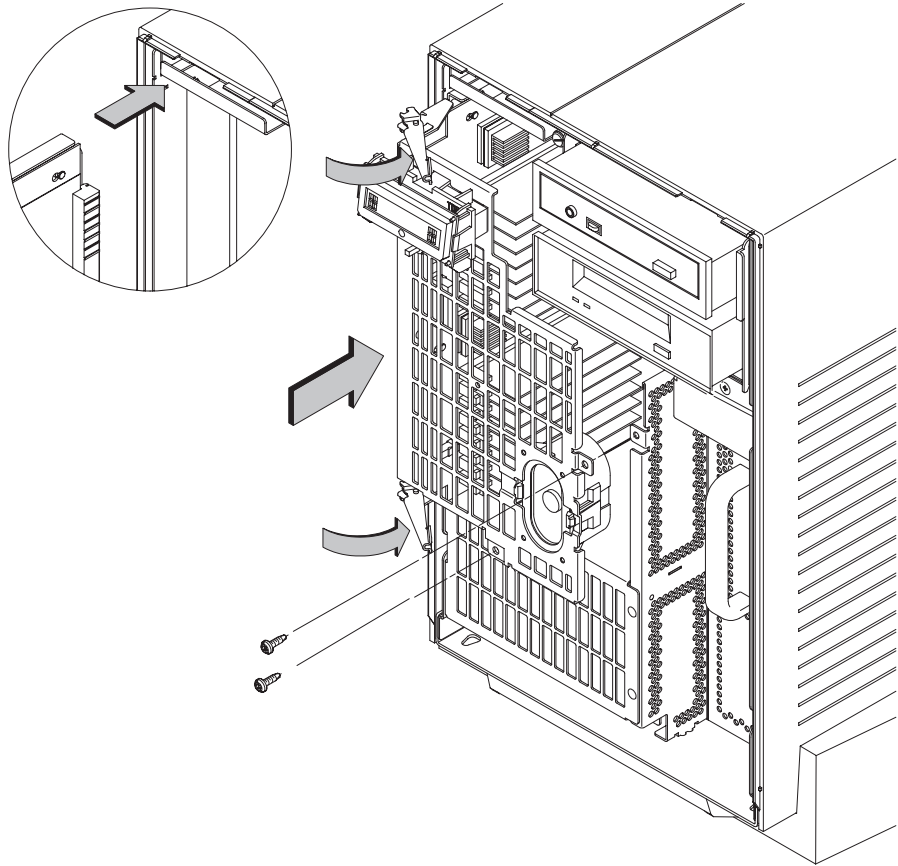


Figure B-26. Replacing the CPU Assembly

Next, align the bottom of the CPU Assembly with the guide on the system unit. With the ejector latches in the open position, slide the CPU Assembly into the system unit as far as it will go. See Figure B-26.

- 14.** Press the ejector tabs all the way in and press on the left edge of the processor module sheet metal to ensure that the processor module is completely seated in the connector. Replace the two screws in the center of the CPU Assembly. Make sure the ejectors are completely depressed to ensure proper connector seating.
- 15.** Close the system unit and reconnect all cables as described in the “Closing the System Unit” section in this appendix.
- 16.** To verify that this installation was successful, follow the steps in Appendix D of this book, “The Boot Console Interface,” on displaying memory information. If you have only replaced a faulty DIMM, you must issue the **pdt clear** command in the service menu of the Boot Console Interface. Answer yes (**y**) to the prompt “Continue? (Y/N) >.”

Replacing the Processor Module



Perform the following steps to replace the processor module on your workstation:

1. Open the system unit according to the directions in the “Opening the System Unit” section earlier in this appendix.
2. Remove the two screws in the center of the CPU Assembly.

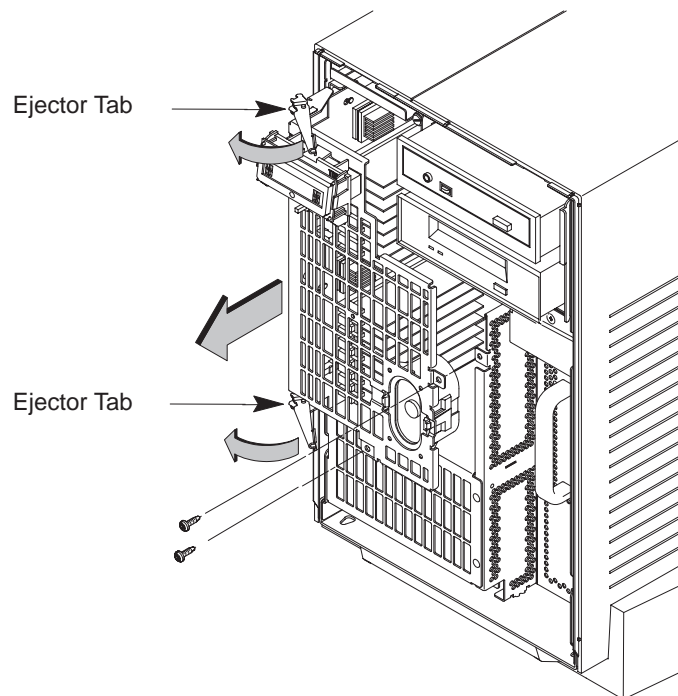


Figure B-27. Removing the CPU Assembly

3. Release the ejector latches on the left side, top, and bottom of the CPU Assembly. Refer to Figure B-27.

4. Pull the CPU Assembly straight out and place on a flat surface with an antistatic mat.
5. Locate the CPU shroud as shown in Figure B-28.

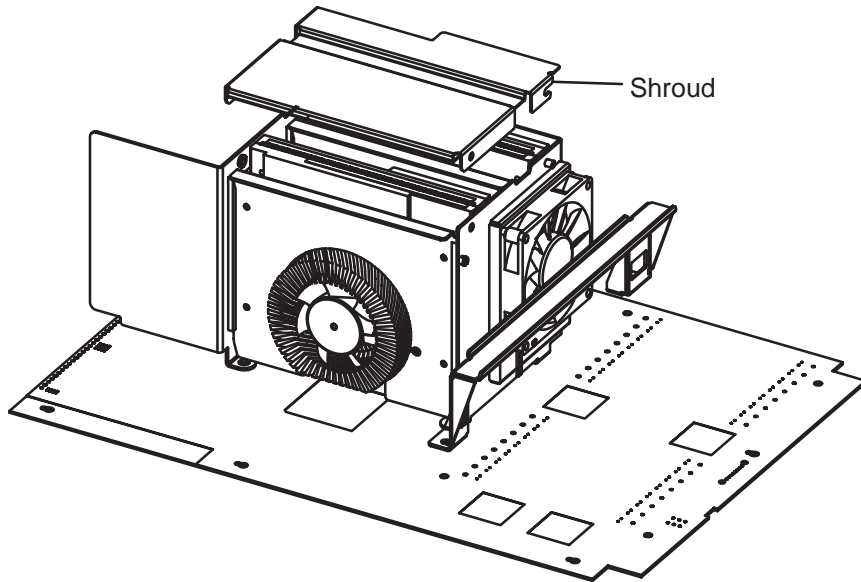


Figure B-28. CPU Shroud Location J282/2240

6. Disconnect the fan cable(s) from the system board.



NOTICE: Be sure to reconnect the fan cables when you have finished installing the processor. The fan not being connected will cause the system to shut down after about 15 seconds of operation.

7. Remove the two screws attaching the shroud cover to the shroud, then slide cover off. Set the shroud cover aside.



NOTICE: The Model 282 and 2240 can be configured with two processors. A single processor must be located in slot 0. Do not mix 282 and 2240 processors in the same system.

8. When replacing a processor module, you must also remove the dust cover it was shipped with. Grasp the module and pull the dust cover evenly to remove.
9. Install the processor by aligning the plastic guide rails on the shroud with the rails on the processor. firmly seat module.

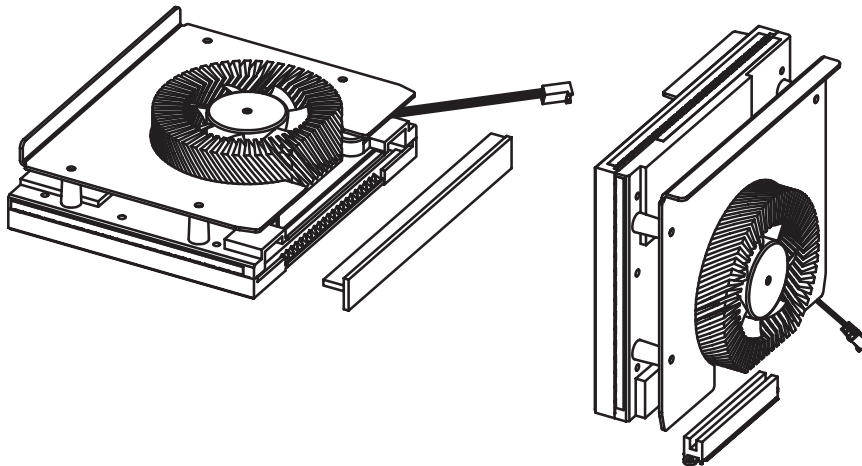


Figure B-29.J282/2240 Processor Modules

- 10.** Insert the board containing the processor module into the guides and press firmly into place.
- 11.** Reconnect the fan cable to the system board.
- 12.** Replace the CPU shroud over the processor and replace the four screws attaching the CPU shroud to the system board
- 13.** To replace the CPU Assembly in the system unit, first align the top of the CPU Assembly with the guide on the system unit. Refer to Figure B-30 and to the label on the back of the assembly. Be sure to support the CPU Assembly properly while replacing it.

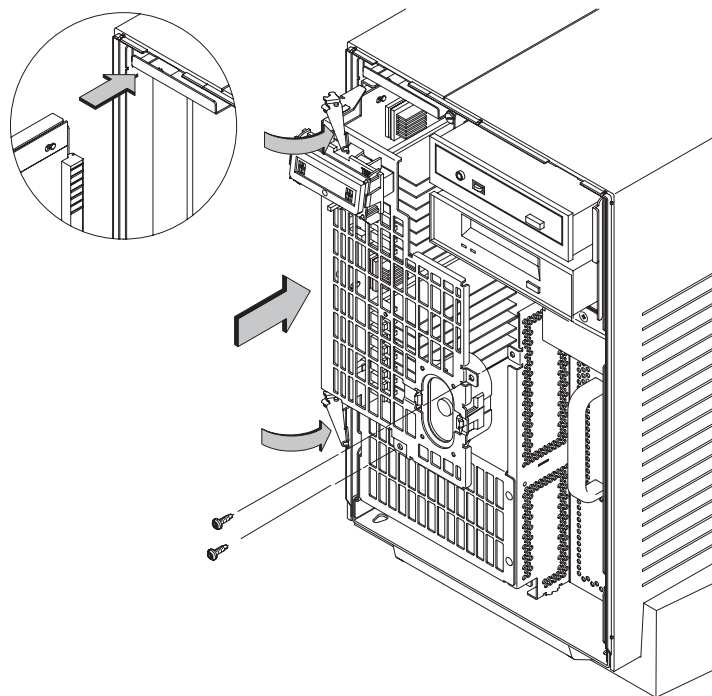


Figure B-30. Replacing the CPU Assembly

Next, align the bottom of the CPU Assembly with the guide on the system unit. With the ejector latches in the open position, slide the CPU Assembly into the system unit as far as it will go. See Figure B-30.

- 14.** Press the ejector tabs all the way in and press on the left edge of the processor module sheet metal to ensure that the processor module is completely seated in the connector. Replace the two screws in the center of the CPU Assembly. Make sure the ejectors are completely depressed to ensure proper connector seating.
- 15.** Close the system unit and reconnect all cables as described in the “Closing the System Unit” section in this appendix.

Installing an EISA, PCI or Graphics Board

Your J282 workstation's EISA Assembly has five slots. Four are EISA slots; of these, two are EISA-only and two are EISA/GSC slots. The bottom slot is GSC only.

Your J2240 workstation's PCI Assembly has five slots. All five slots support PCI cards. Three slots support 32-bit PCI and two support 64-bit PCI. Two of the 64-bit slots and one of the 32-bit slots support GSC. Slot 4 also optionally supports EISA.



NOTICE: The 32-bit PCI slots expect 5.0V signalling, while the 64-bit PCI slots expect 3.3V signalling

The graphics boards supported by your workstation provide:

- HP VISUALIZE EG- Fast 2D graphics
- HP VISUALIZE-8/24 Accelerated 8-plane or 24-plane graphics
- HP VISUALIZE-48 24/24 Image plane, 24-bit Z buffer, 3D graphics
- HP VISUALIZE-FX2, -FX4, -FX6 (J2240 only)



NOTICE: Dual graphics boards take up two slots. Other graphics boards may take one, two or three slots.

Figures B-31, B-32 and B-33 show the physical layout of the EISA/GSC slots, first from outside the system unit, then from inside the PCI and EISA Assemblies.

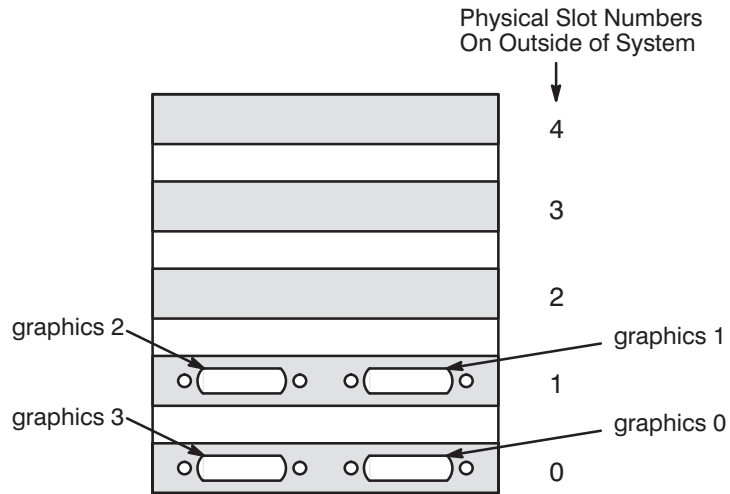


Figure B-31. EISA/PCI/GSC Slots from Outside the EISA/PCI Assembly

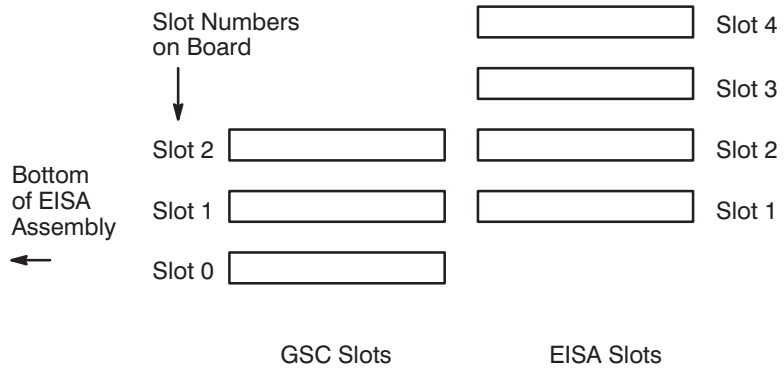


Figure B-32. EISA/GSC Slots from Inside the J282 EISA Assembly

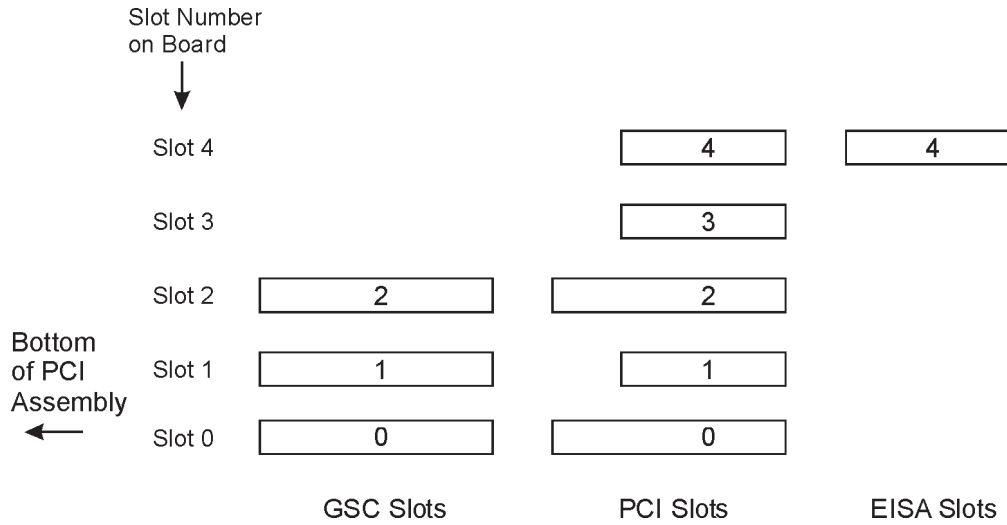


Figure B-33. GSC/PCI/EISA Slots from inside the J2240 PCI Assembly

Physical slot 0 is always reserved for graphics cards only.

graphics0 Graphics device in slot 0. If using a Dual Graphics Card, this is the port to the right on the card when facing the back of the workstation.

graphics1 Graphics device in slot 1. If using a Dual Graphics Card, this is the port to the right on the card when facing the back of the workstation.

graphics2 Graphics device in slot 2. If there is a Dual Graphics Card in slot 1, this is the port to the left on the card when facing the back of the workstation.

graphics3 This is a logical slot, and can only be reached by using the left port of a Dual Graphics Card in physical slot 0.

Follow these steps to install a PCI, EISA or graphics board into your workstation:



1. Working from the rear of the workstation, unscrew the four captive screws and pull the PCI/EISA Assembly straight out using the handle. See Figure B-34.

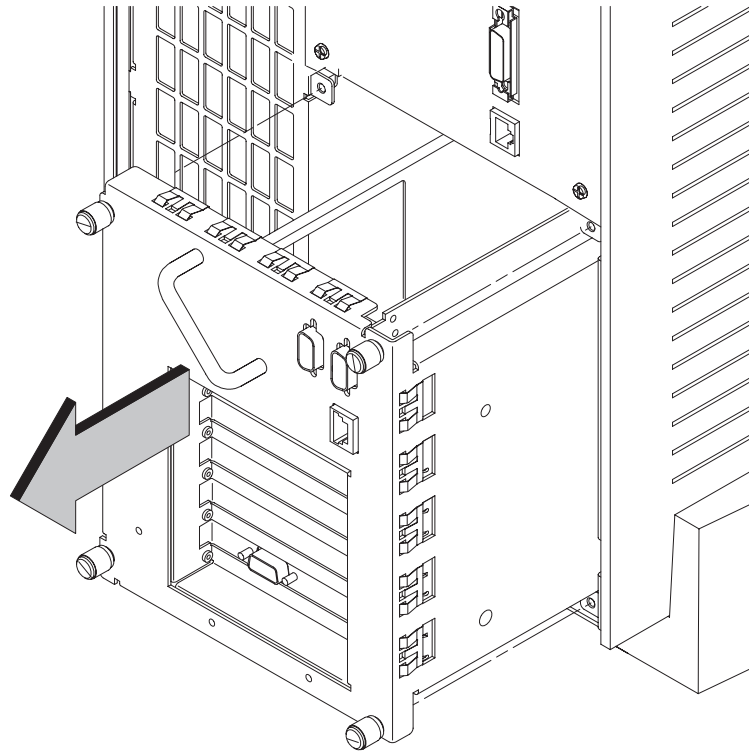


Figure B-34. Removing the PCI/EISA Assembly

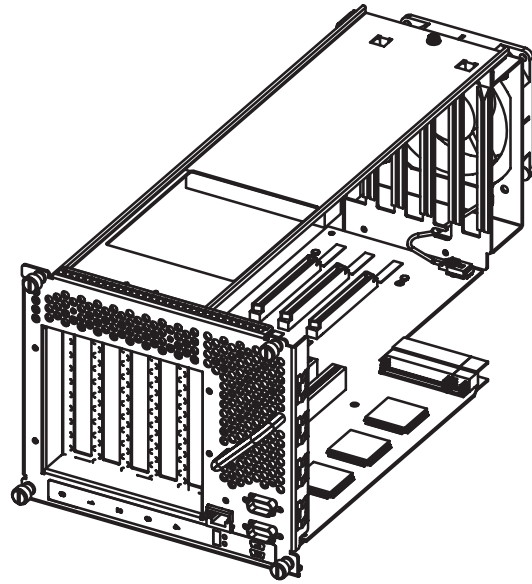


Figure B-35. PCI/EISA I/O Assembly

2. Rotate the unit 90 degrees clockwise and place on a flat surface, as shown in Figure B-36.

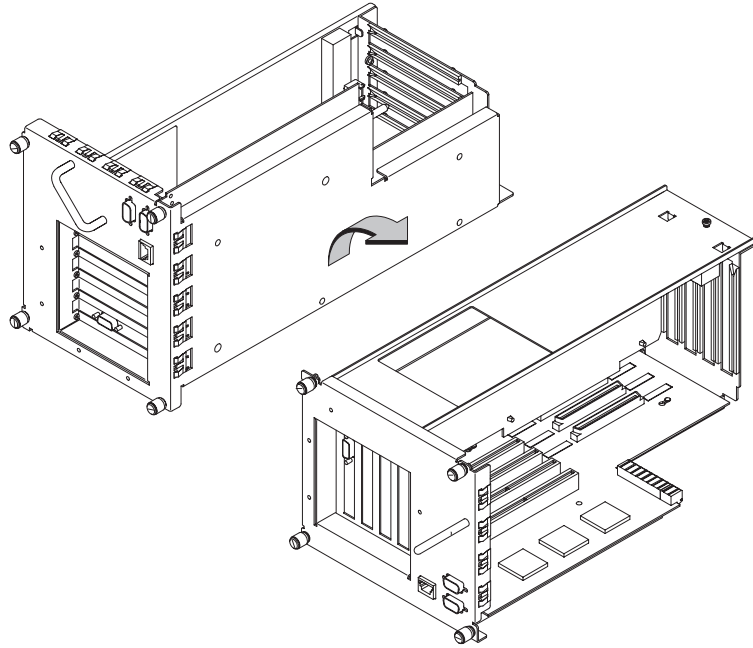


Figure B-36. Rotating the PCI/EISA Assembly for Installation

3. Unscrew one screw at the back of the cover and lift the cover up and out to remove it from the PCI/EISA Assembly. See Figure B-37.

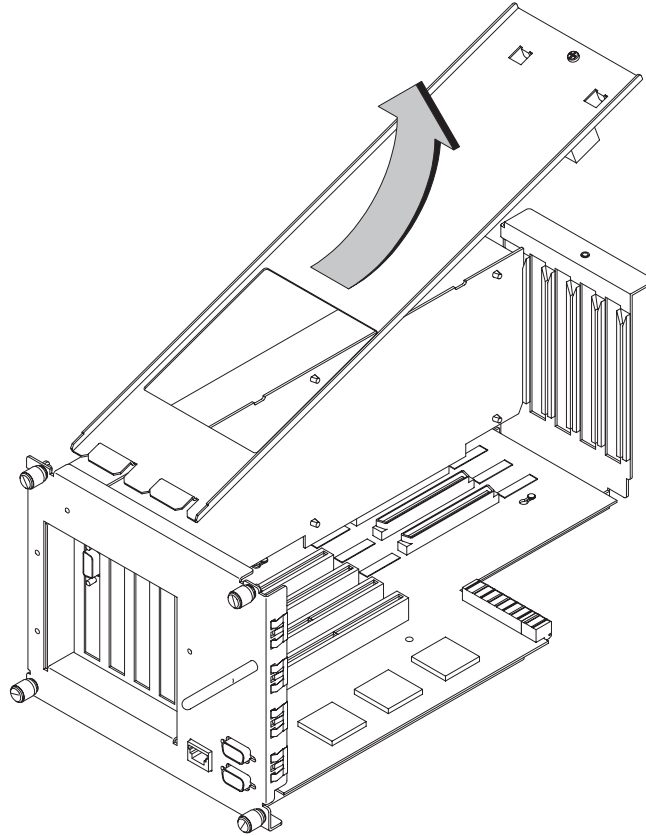


Figure B-37. Removing the PCI/EISA Assembly Cover

4. Unscrew one screw at the top of the slot cover and pull the cover straight up to remove it. See Figure B-38.

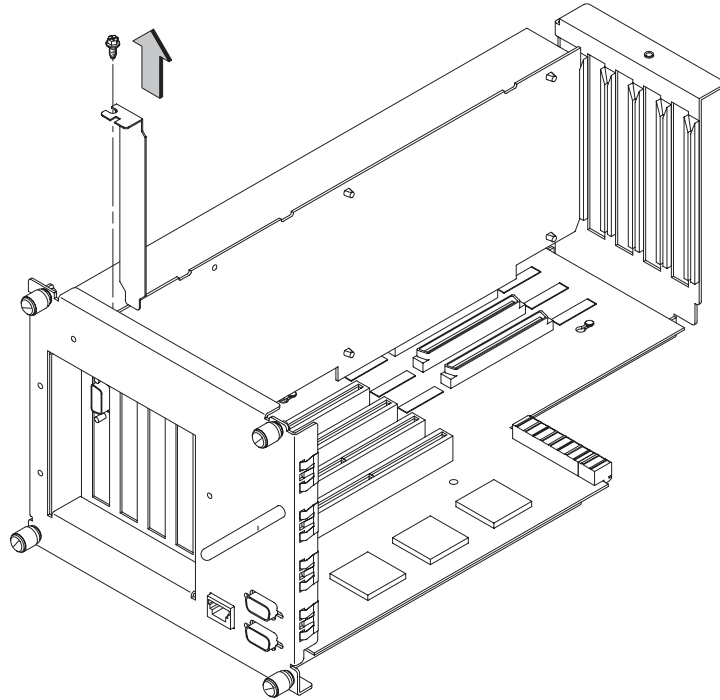


Figure B-38. Removing the PCI/EISA Slot Cover

5. Place PCI, GSC, or EISA board you are installing in the board guides and slide firmly into the connector. Check to see the board is evenly inserted to seat properly. See Figure B-39.

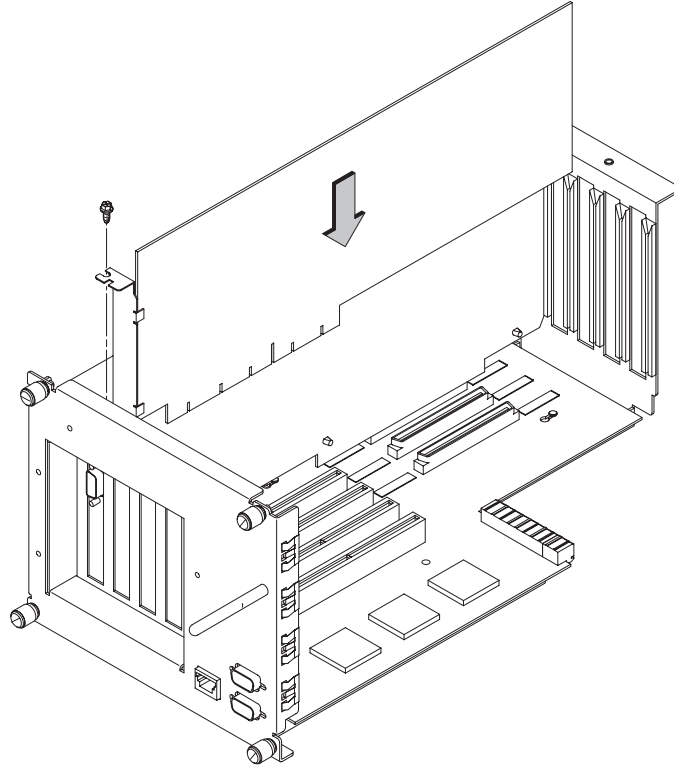


Figure B-39. Installing a PCI, GSC, or EISA or Graphics Board in the PCI/EISA Assembly

6. Secure board with one screw in top of board connector bracket.

7. (J2240 Only) Before installing cover, if you installed an EISA, or graphics board that is taller than a PCI card remove the small break-off block from the cover that corresponds to that slot. Refer to Figure B-40.

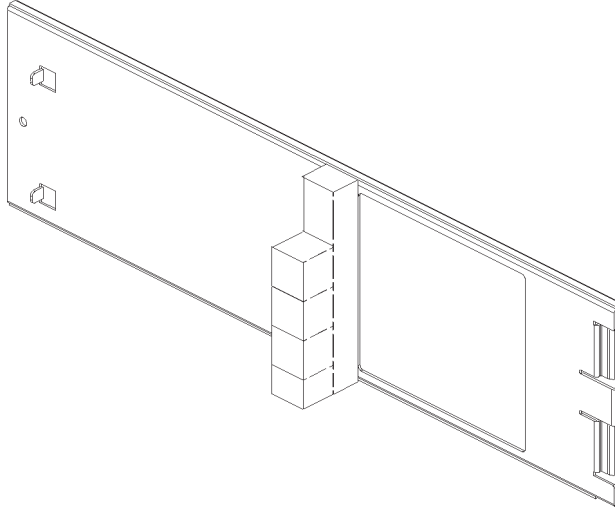


Figure B-40. Remove Block from PCI Assembly Cover

8. Insert cover in guide and secure with screw. Refer to Figure B-41.

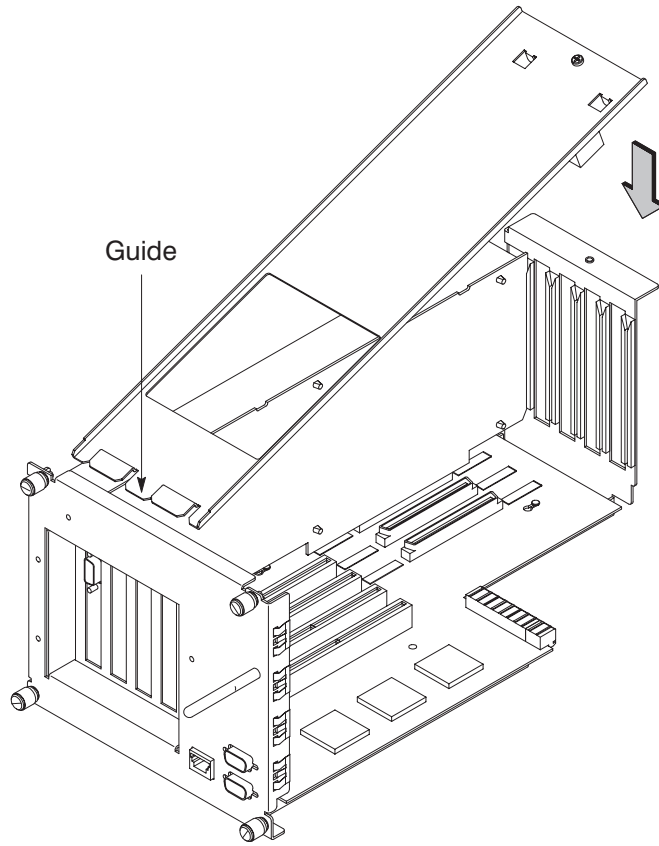


Figure B-41. Replacing PCI/EISA Assembly Cover

9. Rotate the unit back 90 degrees as shown in Figure B-42 and grasp the handle.

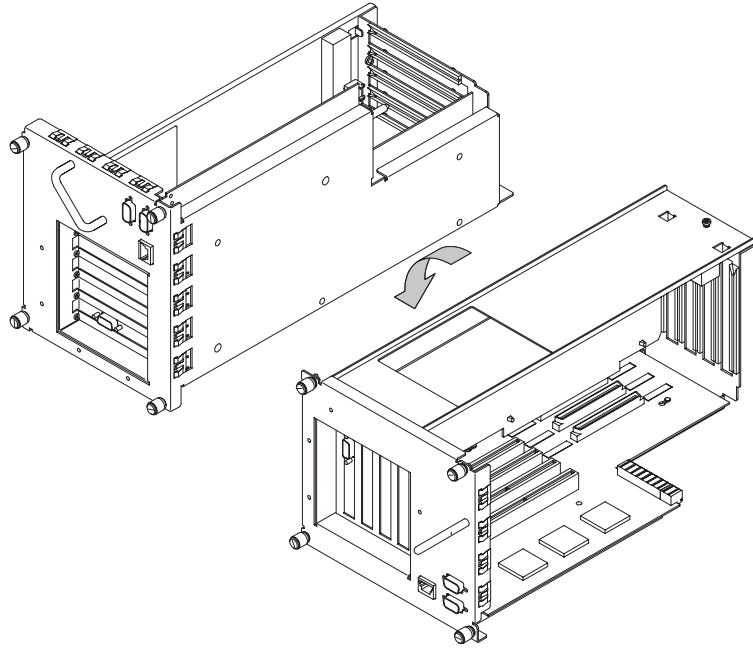


Figure B-42. Rotating the PCI/EISA Assembly Back

10. Slide the PCI/EISA Assembly into the system unit and secure it with the four captive screws. See Figure B-43.

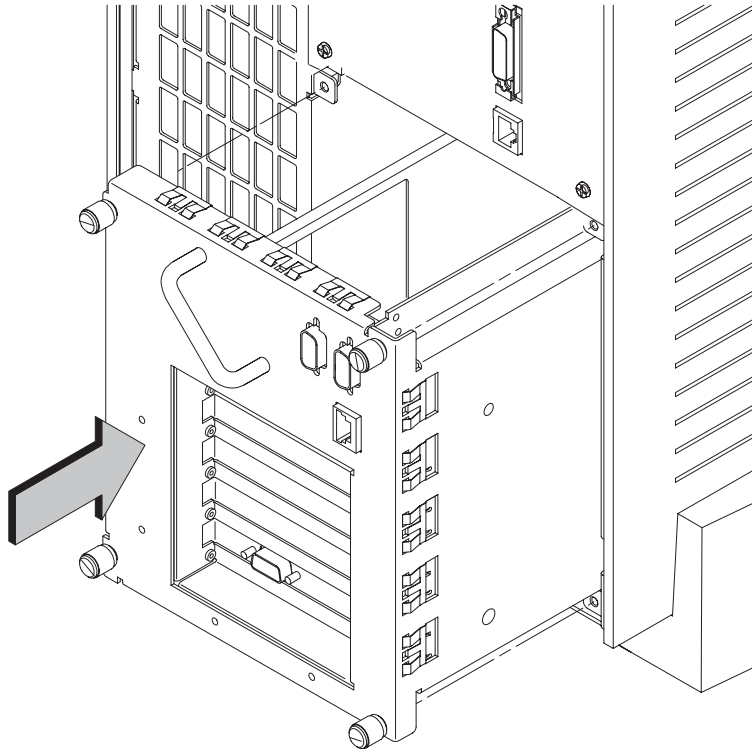


Figure B-43. Replacing PCI/EISA Assembly

Changing Your Monitor Type

Your system ships from the factory preset to use a monitor with a specific resolution and frequency. If you replace your monitor with a different type, you must reconfigure your workstation to support it

There are two ways to configure your workstation to support a different monitor type:

Setting the Monitor Type from the Boot Console Interface

To change your workstation's graphics parameters *before* you replace your monitor, go to "Displaying and Setting the Monitor Type" in Appendix D.

Setting the Monitor Type at Power On

If you

- replace your workstation's monitor with a different monitor type, and
- *do not* set the workstation's graphics parameters by using the **monitor** command before doing so,

then press **Tab** after your keyboard's lights flash during the boot process to initiate the automatic monitor selection process.

Your system queries you for the new monitor type. Select the new type by pressing **Enter**. The system queries you to confirm your selection. Press **y** to save this monitor type.

If you don't press **y**, the system cycles through the other monitor types, some of which your monitor won't display. Wait for the workstation to display your monitor type again, then select it.



Appendix C

SCSI Connections

- SCSI bus differences
- SCSI restrictions
- Determining SCSI bus length
- Assigning SCSI device IDs
- Connecting to the SCSI ports

This appendix provides information about connecting Small Computer System Interface (SCSI) devices to an HP 9000 J282/2240 workstation.

The instructions in this chapter assume you are using the HP-UX version 10.20 or later operating system with the HP VUE version 3.0 interface.



NOTICE: When attaching external SCSI devices, be sure to terminate the last device on the external SCSI bus. If no external devices are attached, the SCSI connector on the rear of the system must be terminated with the terminator that was shipped with your workstation.

SCSI Bus Differences

A Small Computer Systems Interface (SCSI) bus is an IEEE standard bus for connecting your workstation to internal and external devices (SCSI devices) running at different speeds, singly or in combination. Examples of these SCSI devices are floppy disk drives, 4-mm DDS-format tape drives, CD-ROM drives, and Winchester hard disk drives.

There are three types of SCSI buses available with this workstation – a narrow, single-ended (NSE) SCSI bus, a fast, wide differential (FWD) SCSI bus, and an ultra-fast, wide, single-ended (UWSE) SCSI bus. Table C-1 shows the specification differences between these SCSI buses, and Table C-2 shows the SCSI addresses, ID numbers, and arbitration priorities for each.



CAUTION: Do not mix narrow, single-ended, fast, wide differential or ultra, wide, single-ended devices on any one bus type. Doing this will cause a system failure.

Table C-1. SCSI Bus Differences

Transfer Rate	Data Bus Width	Maximum Addresses*	Maximum Cable Length	Device Physical Location	Controller Embedded or Pluggable
Narrow, Single-Ended up to 5 Mbytes per second	8 bits	8	6.0 meters (19.6 feet)	internal and external	embedded
Fast, Wide Differential up to 20 Mbytes per second	16 bits	16	25 meters (82 feet)	internal and external	embedded
Ultra, Wide Single-Ended** up to 40 Mbytes per second	16 bits	16	3.0 meters (9.84 feet)	internal and external	embedded
* Address 7 is reserved for host controller use on both buses. ** Only 2 external devices allowed (total of 4 devices).					

Table C-2. SCSI Bus Addresses, ID Numbers, and Arbitration Priorities

	SCSI-2 Address	SCSI-2 ID Number		Priority
		15 8	7 0	
8-bit devices SCSI-2 Single-Ended	7	. . . . .	1	1
	6	. . . . .	. 1	2
	5	. . . . .	. . 1	3
	4	. . . . .	. . . 1	4
	3	. . . . .	. . . . 1	5
	2	. . . . .	. . . . . 1	6
	1	. . . . .	. . . . . . 1	7
	0	. . . . .	. . . . . . . 1	8
16-bit devices SCSI-3 Fast, Wide or Ultra, Wide-SE Bus	15	1 . . . . .	. . . . .	9
	14	. 1 . . . . .	. . . . .	10
	13	. . 1 . . . . .	. . . . .	11
	12	. . . 1 . . . . .	. . . . .	12
	11	. . . . 1 . . . . .	. . . . .	13
	10	. . . . . 1 . . . . .	. . . . .	14
	9	. . . . . . 1 . . . . .	. . . . .	15
	8	. . . . . . . 1 . . . . .	. . . . .	16

SCSI Restrictions

This section describes the SCSI restrictions that apply to your workstation in the following areas:

- Cables
- Connectors and terminator
- SCSI configuration constraints

Cables

All SCSI devices ship without cables. Only SCSI cables approved by HP can be used to connect your workstation and any SCSI devices. HP offers the following SCSI cables for narrow single-ended SCSI devices:

- K2296 cable with 0.9 meter (3 feet) length
- K2297 cable with 1.5 meter (5 feet) length

HP offers the following SCSI cables for connecting externally connected devices to the system fast, wide differential port:

- C2911A cable with 0.9 meter (3 feet) length
- C2924A cable with 2.5 meter (8.2 feet) length
- C2925A cable with 10.0 meter (32.8 feet) length
- C2926A cable with 20.0 meter (65.6 feet) length

HP offers the following SCSI cables for connecting externally connected devices to the system ultra, wide-SE port:

- C2978A cable with 0.5 meter (1.64 feet) length
- CXXXXA (p/n 5183-3710-9) cable with 0.9 meter (3 feet) length



CAUTION: SCSI cables approved by HP are designed to function within the SCSI tolerances for HP de-

vices. Use of other cables can result in significant problems with system operation.

Narrow singled-ended SCSI definition limits the total cable length of SCSI cables to 6 meters (19.6 feet).

Fast, wide differential SCSI definition limits the total cable length of SCSI cables to 25 meters (82 feet).

Ultra, wide-SE SCSI definition limits the total cable length of SCSI cables to 3 meters (9.84 feet).

Always use the shortest possible cable(s) for your configuration.

If you are daisy-chaining narrow single-ended SCSI devices together, use the following cables:

- 92222A cable with 0.5 meter (1.6 feet) length
- 92222B cable with 1.0 meter (3.2 feet) length
- 92222C cable with 2.0 meter (6.6 feet) length

If you are daisy-chaining fast, wide differential SCSI devices together, use the following cables:

- C2911A cable with 0.9 meter (3 feet) length
- C2924A cable with 2.5 meter (8.2 feet) length
- C2925A cable with 10.0 meter (32.8 feet) length
- C2926A cable with 20.0 meter (65.6 feet) length

If you are daisy-chaining ultra, wide-SE SCSI devices together, use the following cables:

- C2978A cable with 0.5 meter (1.64 feet) length



NOTICE: See “Determining SCSI Bus Length” later in this Appendix to determine the total length of your cables.

Connectors and Terminator

Any narrow, single-ended SCSI device connecting to the system box must use a 50-pin high-density thumb screw connector on the end connecting to the system board, and a 50-pin low-density bail lock connector on the other end. If you attach a second SCSI device, the cable must have low-density connectors on each end.

Any fast, wide differential or ultra, wide-SE SCSI device connecting to the system box must use a 68-pin high-density thumb screw connector on both ends.

The last device connected to the SCSI bus must be terminated with a SCSI terminator. All of the devices listed ship without terminators. If you do not already have a SCSI terminator, you must order terminator K2291 (for 50-pin connectors) or C2905A (for 68-pin fast, wide differential connectors) or C2972A (for 68-pin ultra, wide-SE connectors) from Hewlett-Packard.

SCSI Configuration Constraints

You are limited to a certain number of same-type SCSI devices per system. Before adding another SCSI device, determine if the system can support the additional device.

This workstation offers the following types of SCSI bus, each with its own configuration constraints:

- narrow, single-ended SCSI bus
- fast-wide, differential SCSI bus (J282 or J2240 upgrade)
- ultra, wide-single-ended, SCSI bus (J2240 only)

Narrow, Single-Ended SCSI Bus Configuration Constraints

For the narrow, single-ended SCSI bus, HP-UX supports only **one** of each type of removable disk drive and **two** of the same type tape de-

vices per system. Table C-3 shows configuration constraints for each narrow, single-ended SCSI device type. If the system has internal hard disk drives or a floppy disk drive, you must count them as SCSI devices.

Table C-3. Narrow Single-Ended SCSI Bus Configuration Constraints

Narrow, Single-Ended SCSI Devices	Maximum Number of Each Type of Device Allowed
Hard Disk Drives (internal and external)	7
Floppy Disk Drives	1
CD-ROM Drives	1
4-mm DDS Tape Drives (one internal)	2
9-track Tape Drives	2
650-MB Magneto-Optical Drives	1
Magneto-Optical Autochangers (see notice below)	1
Maximum Number of SCSI Devices	7
<p>NOTICE: Magneto-Optical Autochangers use three SCSI-2 drive addresses. Each address must be accounted for in the maximum number of NSE SCSI devices allowed.</p>	



CAUTION: Do not mix narrow single-ended, ultra, wide-SE and fast, wide differential SCSI peripherals together on the same bus.

Fast, Wide Differential SCSI Bus Configuration Constraints

Fast, wide differential SCSI does not work with the narrow, single-ended SCSI. Table C-4 shows the configuration constraints for each fast, wide differential SCSI device type.

Table C-4. Fast, Wide Differential SCSI Bus Configuration Constraints

External Fast, Wide Differential SCSI Devices	Maximum Number of Each Type of Device Allowed
SCSI-3 Drive (fast, wide disk drives only)	15
SCSI-3 Disk Arrays (addressed as single drive)	7



CAUTION: Do not mix narrow single-ended, ultra, wide-SE and fast, wide differential SCSI peripherals together on the same bus.

Ultra, Wide Single-Ended SCSI Bus Configuration Constraints

Ultra, wide-SE SCSI does not work with the narrow, single-ended SCSI or FWD SCSI. Table C-5 shows the configuration constraints for each ultra, wide-SE SCSI device type.

Table C-5. Ultra, Wide-SE SCSI Bus Configuration Constraints

External Ultra, Wide-SE SCSI Devices	Maximum Number of Each Type of Device Allowed
Ultra, Wide-SE Drive (ultra, wide disk drives only)	2
Ultra, Wide-SE Disk Arrays (addressed as a single drive)	1



CAUTION: Do not mix narrow, single-ended, ultra, wide-SE and fast, wide differential SCSI peripherals together on the same bus.

Determining SCSI Bus Length

This section helps you to determine the total length of the narrow, single-ended SCSI bus, the fast, wide differential SCSI bus and the ultra, wide-SE SCSI bus.

Narrow, Single-Ended SCSI Bus Length

Follow these instructions to calculate your total narrow, single-ended SCSI bus length (including the system unit, external SCSI devices, and SCSI interconnect cables) using Table C-6:



1. Find all of your external NSE SCSI devices in the first column. In the third column, write the NSE SCSI bus lengths (from the second column) that correspond to your devices.



NOTICE: In the third column, the length for the System Unit is already listed. This number must always be used for the system unit.

2. In the fourth column, write down the lengths of the NSE SCSI interconnect cables you are using for your installation. (Cable lengths are listed in subsection “Cables” in the section on “SCSI Restrictions.”)
3. Add up all of the numbers in the third column and write that number on the subtotal line at the bottom of the column. Do the same for the fourth column.
4. Add the subtotals together and write the total in the *Total NSE SCSI Bus Length* box.



NOTICE: The total length of the narrow, single-ended standard SCSI bus must not exceed 6 meters (19.6 feet). If the number you write for *Total*

NSE SCSI Bus Length is greater than 6 meters (19.6 feet), try configuring your installation with shorter cables.

If you have problems, call your designated service representative.

Table C-6. SCSI Bus Length Worksheet for Narrow, Single-Ended SCSI Bus

NSE SCSI Device	Internal NSE SCSI Bus Length meters (feet)	Device Internal Length meters (feet)	External Cable Length meters (feet)
System Unit	1.7 (5.6)	1.7 (5.6)	N/A
7980S	0.0 (0.0)	_____	_____
A1999A	0.3 (1.0)	_____	_____
C1520A	0.2 (0.7)	_____	_____
C1521A	0.2 (0.7)	_____	_____
C1700C	1.1 (3.6)	_____	_____
C1701C	0.3 (1.0)	_____	_____
C1704C	0.0 (0.0)	_____	_____
C1705C	0.0 (0.0)	_____	_____
C2213A	1.5 (4.9)	_____	_____
C2217T	1.3 (4.3)	_____	_____

Subtotals: _____ + _____

Total NSE SCSI Bus Length =

(Total NSE SCSI bus length not to exceed total of 6 meters [19.6 feet])

Fast, Wide Differential SCSI Bus Length

Follow these instructions to calculate your total FWD SCSI bus length for the FWD SCSI- bus on your system using Table C-7:

1. List all of your internal FWD SCSI devices in the first column.
2. In the second column, write the lengths of the internal FWD SCSI bus that correspond to your devices.
3. In the third column, write down the lengths of the FWD SCSI interconnect cables you are using for your installation. (Cable lengths are listed in subsection “Cables” in the “SCSI Restrictions” section.)
4. Add up all of the numbers in the second column and write that number on the subtotal line at the bottom of the column. Do the same for the third column.
5. Add the subtotals together and write the total in the *Total FWD SCSI Bus Length* box.



NOTICE: The total length of the FWD SCSI bus must not exceed 25 meters (82 feet). If the number you write for *Total FWD SCSI Bus Length* is greater than 25 meters (82 feet), try configuring your installation with shorter cables.

If you have problems, call your designated service representative.

Table C-7. SCSI Bus Length Worksheet for Fast, Wide Differential SCSI Bus

FWD SCSI Device	Internal FWD SCSI Bus Length meters (feet)	Device Internal Length meters (feet)	External Cable Length meters (feet)
System Unit	1.7 (5.6)	_____	N/A
C3034T	1.0 (3.3)	_____	_____
C3035T	1.0 (3.3)	_____	_____
C3036T	1.0 (3.3)	_____	_____

Subtotals: _____ + _____

Total FWD SCSI Bus Length =

(Total FWD SCSI bus length not to exceed total of 25 meters [82 feet])

Ultra, Wide–SE SCSI Bus Length

Follow these instructions to calculate your total UWSE SCSI bus length for the UWSE SCSI bus on your system using Table C–8:

1. List all of your internal UWSE SCSI devices in the first column.
2. In the second column, write the lengths of the internal UWSE SCSI bus that correspond to your devices.
3. In the third column, write down the lengths of the UWSE SCSI interconnect cables you are using for your installation. (Cable lengths are listed in subsection “Cables” in the “SCSI Restrictions” section.)
4. Add up all of the numbers in the second column and write that number on the subtotal line at the bottom of the column. Do the same for the third column.
5. Add the subtotals together and write the total in the *Total SCSI Bus Length* box.



NOTICE: The total length of the UWSE SCSI bus must not exceed 3 meters (9.84 feet). If the number you write for *Total SCSI Bus Length* is greater than 3 meters (9.84 feet), try configuring your installation with shorter cables.

If you have problems, call your designated service representative.

Table C-8. SCSI Bus Length Worksheet for Ultra, Wide-SE SCSI Bus

SCSI Device	Internal SCSI Bus Length meters (feet)	Device Internal Length meters (feet)	External Cable Length meters (feet)
System Unit	1.7 (5.6)	1.7 (5.6)	N/A
C6390A	0.3 (1.0)	_____	_____
		_____	_____
		_____	_____

Subtotals: _____ + _____

Total UWSE SCSI Bus Length =

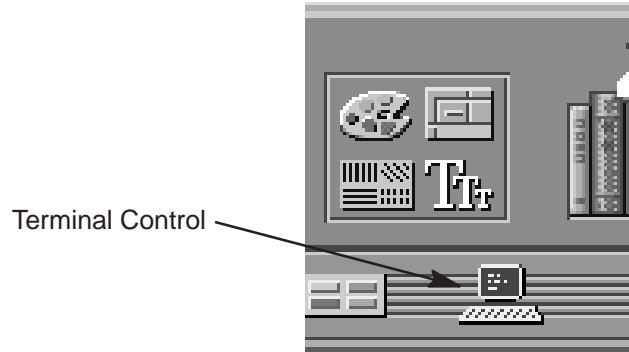
(Total SCSI bus length not to exceed total of 3 meters [9.84 feet])

Assigning SCSI Device IDs

Before assigning a SCSI device ID to your drive, you need to check your existing SCSI device IDs. To determine which SCSI device IDs are available for your device, use the **ioscan** command in a terminal window:



1. Click on the **Terminal Control** on the **Front Panel** of your Workspace.



A terminal window opens.

2. Move the mouse cursor into the terminal window and single-click the left mouse button.
3. Enter the following at the prompt:

```
/usr/sbin/ioscan -f 
```

After a few moments the **ioscan** utility lists all of the SCSI I/O devices it could find. The list appears similar to the following:

Class	I	H/W Path	Driver	S/W State	H/W Type	Description
bc	0		root	CLAIMED	BUS_NEXUS	
bc	1	8	ccio	CLAIMED	BUS_NEXUS	I/O Adapter
ext_bus	0	8/0	c720	CLAIMED	INTERFACE	GSC built-in Fast/Wide SCSI Interface
target	0	8/0.0	tgt	CLAIMED	DEVICE	
disk	3	8/0.0.0	sdisk	CLAIMED	DEVICE	QUANTUM LPS1080WD
target	1	8/0.5	tgt	CLAIMED	DEVICE	
disk	2	8/0.5.0	sdisk	CLAIMED	DEVICE	DEC DSP3210SW
target	2	8/0.6	tgt	CLAIMED	DEVICE	
disk	0	8/0.6.0	sdisk	CLAIMED	DEVICE	DEC DSP3210SW
ba	0	8/12	bus_adapter	CLAIMED	BUS_NEXUS	Core I/O Adapter
ext_bus	2	8/12/0	CentIf	CLAIMED	INTERFACE	Built-in Parallel Interface
audio	0	8/12/1	audio	CLAIMED	INTERFACE	Built-in Audio
tty	0	8/12/4	asio0	CLAIMED	INTERFACE	Built-in RS-232C
ext_bus	1	8/12/5	c700	CLAIMED	INTERFACE	Built-in SCSI
target	3	8/12/5.2	tgt	CLAIMED	DEVICE	
disk	1	8/12/5.2.0	sdisk	CLAIMED	DEVICE	TOSHIBA CD-ROM XM-4101TA
target	4	8/12/5.3	tgt	CLAIMED	DEVICE	
tape	0	8/12/5.3.0	stape	CLAIMED	DEVICE	HP HP35480A
target	5	8/12/5.4	tgt	CLAIMED	DEVICE	
disk	10	8/12/5.4.0	sdisk	CLAIMED	DEVICE	SEAGATE ST3600N
target	6	8/12/5.6	tgt	CLAIMED	DEVICE	
disk	5	8/12/5.6.0	sdisk	CLAIMED	DEVICE	MICROP 2112
lan	0	8/12/6	lan2	CLAIMED	INTERFACE	Built-in LAN
ps2	0	8/12/7	ps2	CLAIMED	INTERFACE	Built-in Keyboard/Mouse
bc	2	10	ccio	CLAIMED	BUS_NEXUS	I/O Adapter
graphics	0	10/0	graph3	CLAIMED	INTERFACE	Graphics
graphics	1	10/8	graph3	CLAIMED	INTERFACE	Graphics
ext_bus	3	10/12	c720	CLAIMED	INTERFACE	GSC add-on Fast/Wide SCSI Interface
target	7	10/12.4	tgt	CLAIMED	DEVICE	
disk	6	10/12.4.0	sdisk	CLAIMED	DEVICE	SEAGATE ST31200W
graphics	2	10/16	graph3	CLAIMED	INTERFACE	Graphics
ba	1	10/20	bus_adapter	CLAIMED	BUS_NEXUS	Core I/O Adapter
hil	0	10/20/1	hil	CLAIMED	INTERFACE	Built-in HIL
tty	1	10/20/2	asio0	CLAIMED	INTERFACE	Built-in RS-232C
ba	2	10/20/5	eisa	CLAIMED	BUS_NEXUS	EISA Bus Adapter
ext_bus	4	10/20/5/3	hshpib	CLAIMED	INTERFACE	EISA card HWP0C70
target	8	10/20/5/3.0	tgt	CLAIMED	DEVICE	
disk	7	10/20/5/3.0.0	cs80	CLAIMED	DEVICE	disk 07959
target	9	10/20/5/3.1	tgt	CLAIMED	DEVICE	
disk	8	10/20/5/3.1.0	cs80	CLAIMED	DEVICE	disk 07959
target	10	10/20/5/3.2	tgt	CLAIMED	DEVICE	
disk	9	10/20/5/3.2.0	cs80	CLAIMED	DEVICE	disk 07959
processor	0	32	processor	CLAIMED	PROCESSOR	Processor
processor	1	34	processor	CLAIMED	PROCESSOR	Processor
memory	0	49	memory	CLAIMED	MEMORY	Memory

4. You can determine which SCSI IDs are currently in use by looking under the **H/W Path** heading. The J2240 lists **8/4/19/0** as the built-in SCSI bus controller. For devices connected to the built-in SCSI bus, such as disks, the fourth number is the SCSI ID for that device. For example, the listing **8/4/19/0.6.0** tells you that there is a SCSI device (a disk) currently using ID 6 on the SCSI bus.

Narrow Single-Ended System SCSI Device IDs

Before assigning a SCSI device ID to your drive, you need to check your SCSI device IDs. To check what SCSI device IDs are available and assign an ID to your device, follow these instructions which use Table C-9:

1. Write in the SCSI device ID of any internal drives in Table C-9.
2. Write in the type of external drives (single-ended standard, EISA, or fast, wide devices) currently connected to your system under the heading “External Device Drives” and each drive’s SCSI device ID under the heading “Device ID Number.”
3. Add your new drive to the table if it is an external device. If it is an internal drive, continue to Step 4.



NOTICE: The C1700A Magneto-Optical Autochanger uses three SCSI addresses, and accounts for three of the seven devices allowed on the SCSI bus.

4. Check to see which SCSI device IDs are not used. You can use ID numbers 0 through 6 if they are not already in use. If the default ID on your drive does not conflict with any existing drive IDs, use that ID. If your default address conflicts with an exist-

ing drive ID, you need to assign a new SCSI device ID to your drive. See the drive installation documentation for information on changing the device ID.



CAUTION: Do not use SCSI device ID 7 for any device except the system card.

Table C-9. Narrow, Single-Ended SCSI Device IDs

SCSI Device Drives	Device ID (Address) Number (Only 0 through 6 Available)	
	Internal	External
Internal System Drives:		
System SCSI Drive(s)		
Floppy Disk Drive (if present, uses ID No. 0)	_____	N/A
CD-ROM Drive (if present, uses ID No. 2)	_____	N/A
4-mm DDS Tape Drive (if present, uses ID No. 1)	_____	N/A
External Device Drives:		
1st External Device _____	N/A	_____
2nd External Device _____	N/A	_____
3rd External Device _____	N/A	_____
4th External Device _____	N/A	_____
5th External Device _____	N/A	_____
6th External Device _____	N/A	_____
7th External Device _____	N/A	_____
NOTICE: You can have no more than 7 SCSI devices (internal and external) connected to the system.		

5. Write in the SCSI device ID of any internal drives.

6. Write in the type of external single-ended drives currently connected to your workstation under the heading “External Device Drives” and each drive’s SCSI device ID under the heading “Device ID Number.”
7. Add your new drive to the table if it is an external device. If it is an internal drive, continue to Step 8.



NOTICE: The C1700A Magneto-Optical Autochanger uses three SCSI IDs, and accounts for three of the seven devices allowed on the SCSI bus.

8. Check to see which SCSI device IDs are not used. You may use ID numbers 0 through 6 if they are not already in use. If the default ID on your drive does not conflict with any existing drive IDs, use that ID. If your default address conflicts with an existing drive ID, you need to assign a new SCSI device ID to your drive. Refer to the drive’s installation documentation for information on changing the device ID.



CAUTION: Do not use SCSI device ID 7 for any device. It is reserved for the built-in SCSI bus controller.

Fast, Wide Differential SCSI IDs

Before assigning a SCSI device ID to your drive, you need to check your SCSI device IDs. To check which SCSI device IDs are available and assign an ID to your device, follow these instructions which use Table C-10:

1. Write in the type of internal drives currently connected to your system under the heading “Fast, Wide Differential SCSI Device Drives” and each drive’s SCSI device ID under the heading “Device ID Number.”
2. Add your new drive to the table.
3. Check to see what SCSI device IDs are not used. You may use ID numbers 0 through 6 and 8 through 15 if they are not already in use. If the default ID on your drive does not conflict with any existing drive IDs, use that ID. If your default address conflicts with an existing drive ID, assign a new fast, wide differential SCSI device ID to your drive. Refer to the drive’s installation documentation for information on changing the device ID.



CAUTION: Do not use SCSI device ID 7 for any device.

Table C-10. Fast, Wide Differential SCSI Device IDs

Fast, Wide Differential SCSI Device Drives	Device ID (Address) Number (ID 7 not available)
1st Internal Device _____	6
2nd Internal Device _____	5
NOTICE: You can have no more than 15 SCSI devices connected to a FWD SCSI bus.	

Ultra, Wide–SE SCSI IDs

Before assigning a SCSI device ID to your drive, you need to check your SCSI device IDs. To check which SCSI device IDs are available and assign an ID to your device, follow these instructions which use Table C–11:

1. Write in the type of internal drives currently connected to your system under the heading “Ultra, Wide SCSI Device Drives” and each drive’s SCSI device ID under the heading “Device ID Number.”
2. Add your new drive to the table.
3. Check to see what SCSI device IDs are not used. You may use ID numbers 0 through 6 and 8 through 15 if they are not already in use. If the default ID on your drive does not conflict with any existing drive IDs, use that ID. If your default address conflicts with an existing drive ID, assign a new fast, wide SCSI device ID to your drive. Refer to the drive’s installation documentation for information on changing the device ID.



CAUTION: Do not use SCSI device ID 7 for any device.

Table C–11. Ultra, Wide–SE SCSI Device IDs

Ultra, Wide Single–Ended Device Drives	Device ID (Address) Number (ID 7 not available)
1st Internal Device _____	6
2nd Internal Device _____	5
NOTICE: You can have no more than 4 SCSI devices connected to an UWSE bus.	

Connecting to the SCSI Ports

This section describes how to connect to the system SCSI ports (narrow single-ended, ultra, wide-SE and fast, wide differential).

System SCSI Port Connection

The system contains two (2) SCSI connectors:

- System Single-Ended SCSI-2 Connector
- System Fast, Wide Differential or Ultra, Wide-SE SCSI Connector

Figure C-1 shows the rear panel with terminators attached to the two SCSI connectors. Figure C-2 shows the two SCSI connectors without terminators. SCSI cables connect to these ports with a high-density thumb screw connector.

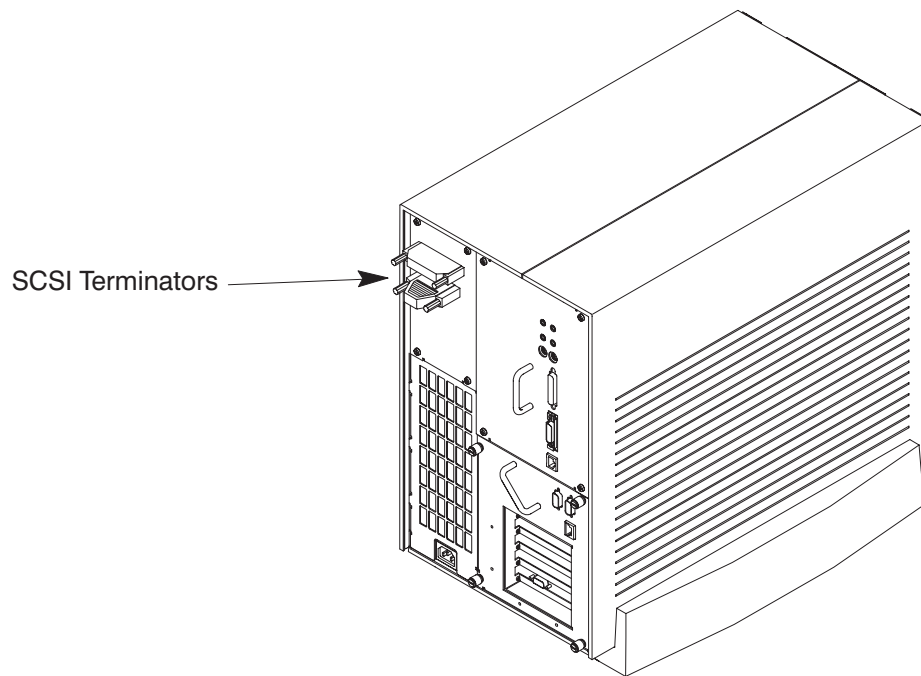


Figure C-1. Rear Panel SCSI Connectors with Terminators Attached

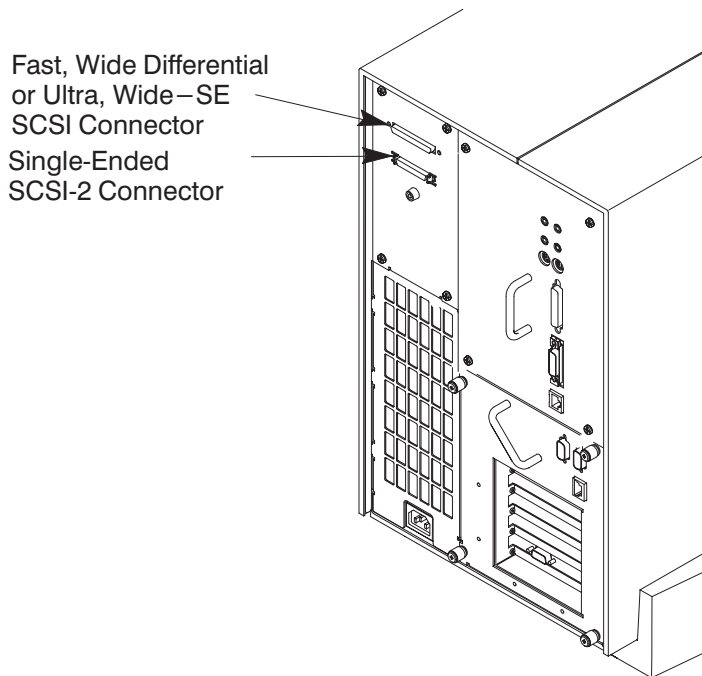
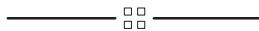


Figure C-2. Rear Panel SCSI Connectors without Terminators



NOTICE: The last device connected to the SCSI bus must be terminated with a SCSI terminator. All of the devices listed ship without terminators. If you do not already have a SCSI terminator, you must order terminator K2291 (NSE), C2905A (FWD), or C2972A (UWSE) from Hewlett-Packard.



Appendix D

The Boot Console Interface

This appendix describes the different features of the boot console interface and how to use them. It presents the information in the following sections:

- Boot console interface features
- Accessing the boot console interface
- Booting your workstation
- Searching for bootable media
- Resetting your workstation
- Displaying and setting paths
- Displaying and setting the monitor type
- Displaying the current memory configuration
- Displaying the status of the System I/O
- Setting the Auto Boot and Auto Search flags
- Displaying and setting the Security mode
- Displaying and setting the Fastboot mode
- Displaying the LAN station address
- Displaying system information
- Displaying PIM information

Boot Console Interface Features

There are times when you want to interact directly with the hardware of your workstation before it boots the operating system. Your workstation provides a menu-driven boot console interface that allows you to perform special tasks, display information, and set certain system parameters, even if the operating system is unavailable.

Here are some of the things you can do:

- Boot your workstation
- Search for bootable media
- Reset your workstation
- Display and set boot paths
- Display and set your monitor type
- Display memory configuration information
- Display the status of the EISA slots
- Set Auto Boot and Auto Search
- Set Fastboot
- Display LAN information
- Display system information
- Display PIM information



NOTICE: All of the tasks in the boot console interface should be performed by a system administrator.

The **boot console** menus follow, showing the various tasks you can perform and the information available.

The shortened version of all commands is indicated by the uppercase letters.

Help is available for all the menus and commands by using either **help**, **he**, or **?** and the menu or command you want help on.

```
----- Main Menu-----
```

Command	Description
-----	-----
BOot [PRI|ALT|<path>]	Boot from specified path
PAth [PRI|ALT|CON|KEY][<path>]	Display or modify a path
SEArch [DIisplay|IPL] [<path>]	Search for boot devices
COntfiguration [<command>]	Access Configuration menu/commands
INformation [<command>]	Access Information menu/commands
SERvice [<command>]	Access Service menu/commands
DIisplay	Redisplay the current menu
HElp [<menu>|<command>]	Display help for menu or command
RESET	Restart the system
Main Menu: Enter command >	

----- Configuration Menu-----

Command	Description
Auto [B0ot|SEArch] [ON|OFF]	Display or set specified auto flag
BootID [<proc>] [<boot ID>]	Display or modify processor boot ID
BootINfo	Display boot-related information
BootTimer [0 - 200]	Seconds allowed for boot attempt
CPUconfig {<proc>} [ON|OFF]	Config/deconfig processor
Default	Set the system to predefined values
FastBoot [ON|OFF]	Display or set boot tests execution
LanConfig	Display or set LAN Configuration
MONitor [LIST <path> <type>]	Change the current monitor type
PAth [PRI|ALT|CON|KEY] [<path>]	Display or modify a path
SEArch [DISplay|IPL] [<path>]	Search for boot devices
SECure [ON|OFF]	Set/show security mode
TIme [c:y:m:d:h:m:[s]	Read or set real time clock in GMT
BOot [PRI|ALT|<path>]	Boot from specified path
DISplay	Redisplay the current menu
HElp [<menu>|<command>]	Display help for menu or command
RESET	Restart the system
MAIn	Return to Main Menu

Configuration Menu: Enter command >

----- Information Menu -----

Command	Description
-----	-----
ALL	Display all system information
BootINfo	Display boot-related information
CAche	Display cache information
ChipRevisions	Display revisions of VLSI and firmware
COprocessor	Display coprocessor information
FwrVersion	Display firmware version
IO	Display I/O interface information
LanAddress	Display built-in system LAN address
MEemory	Display memory information
PRocessor	Display processor information
WARnings	Display selftest warning messages
BOot [PRI|ALT|<path>]	Boot from specified path
DIisplay	Redisplay the current menu
HElp [<menu>|<command>]	Display help for menu or command
RESET	Restart the system
MAin	Return to Main Menu

Information Menu: Enter command >


```

----- Service Menu -----
Command                Description
-----
ChassisCodes [<proc>]  Display chassis codes

CLEARPIM                Clear (zero) the contents
                        of PIM
EepromRead [<addr>] {<len>} Read EEPROM locations
MemRead <addr> [<len>] [a] Read memory locations
PDT [CLEAR]            Display or clear the Page
                        Deallocation Table
PIM [<proc> [HPMC|LPMC|TOC]] Display PIM information

BOot [PRI|ALT|<path>]  Boot from specified path
DIsplay                Redisplay the current menu
HElp [<menu>|<command>] Display help for menu or
                        command

RESET                  Restart the system
MAin                  Return to Main Menu
-----
Service Menu: Enter command >

```

Accessing the Boot Console Interface

To access the boot console interface, follow these steps:



NOTICE: This procedure should be done by a system administrator.

1. Close any files and applications on your workstation.
2. Press the power switch on the front panel of the system unit.



NOTICE: There is no need to manually shut down the HP-UX operating system on your workstation before powering it off. When you turn off the power switch, your workstation automatically shuts down the operating system before terminating the power.

Make sure that you do not unplug the system's power cord or otherwise interrupt power to the system unit at this time.

3. When the system has completely shut down, power on your workstation.

If Autoboot is turned off, the boot sequence automatically stops at the bootconsole Main Menu.

If Autoboot is turned on, you will see the following messages:

```
Processor is starting Autoboot process. To  
discontinue, press any key within 10 seconds.
```

If Autoboot and Autosearch are both turned on, you will see the following messages:

```
Processor is booting from first available de-  
vice. To discontinue, press any key within 10  
seconds.
```



NOTICE: If you are using a power-saving monitor, you will have less than 10 seconds from the time this message appears to press a key.

4. Press a key. You will then see the message:

Boot terminated

The Main Menu of the boot console appears.

Booting Your Workstation

Usually, you start your workstation by turning it on and waiting for HP-UX to boot automatically. However, you may not always want the usual sequence to occur.

For example, you may want to start your workstation from an operating system that is stored on a device that is different from your usual boot device. If your normal operating system kernel or the disk on which it resides becomes damaged or unusable, you may wish to boot from a different disk or perhaps another type of device, such as a DDS-format tape drive.

Here are some situations and examples:

- If you know which device you want to boot from, and you know that it contains a bootable operating system, follow the directions in "Accessing the Boot Console Interface" earlier in this appendix, and then type the following at the prompt:

Main Menu: Enter command > **boot** *device*

where **device** is the **hardware path** to the device, specified in Mnemonic Style Notation.

For example, if you wish to boot an operating system that is stored on a DDS-format tape in a drive that is located at "sescsi.1.0", follow the directions in "Accessing the Boot Console Interface" earlier in this appendix, and then type the following command at the prompt:

Main Menu: Enter command > **boot** **sescsi.1.0**

- If you do not know which device you want to boot from, then type the following at the prompt:

Main Menu: Enter command > **search**

Path Number	Device Path	Device Type
-----	-----	-----
P0	FWSCSI.6.0	HP C2490WD
P1	SESCSI.1.0	HP HP35480A

Main Menu: Enter command > **Boot P1**

The operating system on the specified device is used to start your workstation (also **see**; *Searching for Bootable Media*).

- If you wish to interact with the **Initial System Loader (ISL)** before booting your workstation, follow the directions in "Accessing the Boot Console Interface" earlier in this appendix, and then type the following at the prompt:

Main Menu: Enter command > **boot device**

You are prompted:

```
Interact with ISL (Y,N,Q)>
```

Answering yes (**Y**) causes the ISL to be loaded from the specified device. After a short time, the following prompt appears on your screen:

```
ISL>
```

ISL is the program that actually controls the loading of the operating system. By interacting with ISL, you can choose to load an alternate version of the HP-UX operating system. If you do not want ISL to be loaded, you must enter **N**.

For example, if the usual kernel (**/stand/vmunix**) on your root disk (**fwscsi.6.0**) has become corrupted, and you wish to boot your workstation from the backup kernel (**/stand/vmunix.prev**), type the following at the ISL> prompt:

ISL> **hpux /stand/vmunix.prev**

- If you do not know which media in your file systems have bootable operating systems, you can find them with the **search IPL** command.

Searching for Bootable Media

To list devices that contain bootable media, follow the directions in "Accessing the Boot Console Interface" earlier in this appendix, and then type the following at the prompt:

Main Menu: Enter command `> search ipl`

The search command searches all buses. The search may turn up more devices than there are lines on your display. If you are using a text terminal, you may control the progress of the search from your terminal's keyboard by performing the following steps:

- To hold the display temporarily, press **Ctrl S**.
- To continue the display, press **Ctrl Q**.
- To halt the search, press any other key

These flow-control commands do not work with a bitmapped display, but such a display can show more than forty lines of text, so you are unlikely to need them.

To search for devices of just one type that actually contain bootable media, follow the directions in "Accessing the Boot Console Interface" earlier in this appendix, and then type the following at the prompt:

Main Menu: Enter command `> search ipl device_type`

where *device_type* is one of the following:

fwscsi is the built-in fast, wide SCSI bus.

sescsi is the built-in single-ended SCSI bus.

lan is all connections to the built-in LAN.

gscn is an optional fast, wide SCSI interface in slot number *n*.

Resetting Your Workstation

To reset your workstation to its predefined values, follow the directions in "Accessing the Boot Console Interface" earlier in this appendix, and then type the following at the prompt to access the Configuration Menu:

Main Menu: Enter command > **co**

When the Configuration Menu appears, type the following at the prompt:

Configuration Menu: Enter command > **default**

Displaying and Setting Paths

A path is the hardware address of a device that is attached to the I/O system of your workstation. The path command sets the system paths shown in Table D-1.

The path command sets and displays the hardware address of a specified device attached to the I/O bus of your workstation.

Table D-1. System Paths

Path Type	Device
primary or pri	Your workstation's default boot device (usually the root disk)
alternate or alt	Your workstation's alternate boot device (usually a DDS-format tape device)
console or cone	Your workstation's primary display device
keyboard or key	Your workstation's primary input ASCII device

To display the current settings for the system paths, type the following at the prompt:

Main Menu: Enter command > **path**

The paths are displayed in Mnemonic Style Notation, as shown in Table D-2.

Table D-2. Mnemonic Style Notation for Boot Paths

I/O Type	Specification Format
Built-in FWSCSI	core.fwscsi.scsi_address.logical_unit_number slotn.fwscsi.scsi_address.logical_unit_number
Built-in SCSI	core.scsi.scsi_address.logical_unit_number
Built-in LAN	core.lan.server_address.init_timeout.io_time- out

To display the current setting for a particular system path, follow the directions in "Accessing the Boot Console Interface" earlier in this appendix, and then type the following at the prompt:

Main Menu: Enter command > **path** *path_type*

where *path_type* is one of the path types listed in Table D-1.

For example, to get the path to the primary boot device, follow the directions in "Accessing the Boot Console Interface" earlier in this chapter, and then type the following at the prompt:

Main Menu: Enter command > **path primary**

To set a system path to a new value, follow the directions in "Accessing the Boot Console Interface" earlier in this chapter, and then type the following at the prompt:

Main Menu: Enter command > **path** *path_type* *path*

where *path_type* is one of the path types listed in Table D-1 and *path* is the specification of the path in Mnemonic Style Notation (as described in Table D-2). For example, to set the primary boot path to a SCSI disk with an ID of 6.0, follow the directions in "Accessing the Boot Console Interface" earlier in this appendix, and then type the following at the prompt:

Main Menu: Enter command > **path pri sescsi.6.0**

Displaying and Setting the Monitor Type

Your system ships from the factory preset to use a monitor with a specific resolution and frequency. If you replace your workstation's monitor with a different type of monitor, you must reconfigure your workstation to support the new monitor.

The Monitor Command

The monitor command lets you change your workstation's graphics configuration. This command is available in Configuration Menu of the boot console interface.



NOTICE: The monitor command lets you change your workstation's graphics configuration before you replace your monitor. For information about changing the configuration after you replace your monitor, refer to "Changing Your Monitor Type" in Appendix B.

To display the current graphics and console information, enter the following command;

Main Menu: Enter command > **co**

Configuration: Enter command > **mo**

The correct usage for setting the graphics configuration is:

mo *graphics_path type*

where valid *graphics_path* parameters are:

graphics(0) through *graphics(2)* – Graphics adapters installed in option slots 0 through 2 and *type* is the numerical monitor type.

For example, a Dual Visualize Enhanced Graphics Card (A4451A) installed in option slot 2 would be *graphics(2A)* and *graphics(2B)*.

Displaying the Current Monitor Configuration

To display the current monitor configuration for your system from the Configuration Menu of the boot console interface, follow the directions in "Accessing the Boot Console Interface" earlier in this appendix. Once you are in the Boot Console Interface Main Menu, enter:

Main Menu: Enter command > **configuration**

This places you in the Configuration Menu. From here, enter:

Configuration Menu: Enter command > **monitor**

The screen displays a list of the current graphics adapters and there monitor types configured for your workstation.

```
MONITOR INFORMATION

Path      Slot Head  HPA  Resolution  Freq  Type Class
-----
GRAPHICS(1) 1    1  f8000000 1280x1024  72Hz  12

Configuration Menu: Enter command >
```

In this example, only the graphics adapter(located in slot 1) graphics(1) is configured. The monitor type for graphics(1) is set to type 12, which is a 1280 by 1024 monitor that uses a frequency of 72 Hz.

Setting the Monitor Type

You can set the monitor type for a graphics adapter by entering the following:

```
Configuration Menu: Enter command > monitor graphics(n)  
tt
```

Where *n* is the number of the graphics adapter and *tt* is the monitor type.

To display a list of supported monitors, enter the following command:

```
Configuration Menu: Enter command > monitor list
```

A list of valid monitor types similar to the following is displayed:

MONITOR INFORMATION

Path	Slot	Head	Type	Size	Freq	Class
----	----	----	----	-----	----	-----
GRAPHICS(0)	0	1	1	1280x1024	75Hz	VESA
GRAPHICS(0)	0	1	2	1280x1024	75Hz	VESA,Double buffered
GRAPHICS(0)	0	1	3	1280x1024	75Hz	VESA,Grey scale
GRAPHICS(0)	0	1	4	1280x1024	75Hz	VESA,Double buffered,Greyscale
GRAPHICS(0)	0	1	5	1024x768	75Hz	VESA
GRAPHICS(0)	0	1	6	800x600	75Hz	VESA
GRAPHICS(0)	0	1	7	640x480	75Hz	VESA
GRAPHICS(0)	0	1	8	1600x1200	75Hz	VESA

```
GRAPHICS(0)    0    1    9 1600x1200  75Hz VESA,Grey
                scale
GRAPHICS(0)    0    1   10 1200x1600  75Hz VESA
GRAPHICS(0)    0    1   11 1200x1600  75Hz VESA,Grey
                scale
GRAPHICS(0)    0    1   12 1280x1024  72Hz
GRAPHICS(0)    0    1   13 1280x1024  72Hz Double buff
                ered
GRAPHICS(0)    0    1   14   640x480   60Hz
GRAPHICS(0)    0    1   15 -----user defined-----
```

Configuration Menu: Enter command >

To set the monitor type for graphics(0) to monitor type 2, enter the following:

Configuration Menu: Enter command **>monitor graphics(0) 2**

This will take effect on the next reboot.

MONITOR INFORMATION

Path	Slot	Head	HPA	Resolution	Freq	Type	Class
-----	-----	-----	-----	-----	-----	-----	-----
GRAPHICS(0)	0	1	f8000000	1280x1024	72Hz	2	

The boot console displays a message that tells you that your new monitor selection will take affect the next time you reboot your system. The boot console also displays the new monitor information.

Trying to change the monitor type to a number not listed for that graphics device fails and gives you the following warning message:

Value of monitor type n out of range (n - nn)

Trying to change the monitor type on an empty slot fails and gives you the following warning message:

No such graphics card.

Setting the Monitor Type at Power On

If you replace your workstation's monitor with a different monitor type, and do not set the workstation's graphics parameters by using the monitor command before doing so, you need to perform the following:

Wait two seconds after the Num Lock light flashes near the end of the boot sequence, then press Tab to initiate the automatic monitor selection process.



NOTICE: It takes approximately one to two minutes after powering on the workstation before the Num Lock light flashes.

The system cycles through all of the available monitor types one at a time. When you can see a message similar to the following clearly and legibly, select that monitor type by pressing Enter:

Path	Slot	Head	Type	Size	Freq	Class
-----	-----	----	----	----	----	-----
GRAPHICS(1)	1	1	n	nnnnxnynn	nnHz	

Press [RETURN] to select this monitor type
(type n of n types).

The system queries you to confirm your selection. Press **Y** to save this monitor type.

If you press any key other than **Y**, the following message is displayed:

Monitor type not saved.

At this point, the new monitor type is active, but not saved. Because you didn't save the monitor type, the next time you reboot the system the original monitor type will be used.

Next, the following message is displayed:

To select a new Graphics Monitor Type press the <TAB> key now, otherwise EXIT by entering any other key (or will time out in 15 seconds)...

To restart the monitor selection process, press TAB.

Changing the Console to External Terminal

In the event that your console stops displaying to your graphics device, use the following procedure to display the console to an external terminal:

1. Turn system power off.
2. Disconnect the PC keyboard connector from the system rear panel.
3. Connect a serial terminal to the Serial 1 connector (the left serial connector) on the system rear panel (PCI/EISA assembly).
4. Power on the system.

The system will now display the console to the terminal connected to the Serial 1 port.

Displaying the Current Memory Configuration

The following sample screen output using the memory command shows: first, a memory configuration table with properly-installed and configured memory (Sample Output 1); and second, output when a DIMM has been improperly installed (Sample Output 2).

To display the current memory configuration for your system, from the Information Menu of the boot console interface, follow the directions in "Accessing the Boot Console Interface" earlier in this appendix. Once you are in the Boot Console Interface Main Menu, type:

Main Menu: Enter command > **information**

This places you in the Information Menu. From here type:

Information Menu: Enter command > **memory**

The screen displays status and configuration information for the memory DIMMs installed in your workstation. The first listing below shows the memory information for a system with correctly installed and configured memory modules. The second listing shows the information for a system that has memory modules incorrectly installed or configured.

Memory Information Sample 1

The following sample shows the memory information when memory modules are properly installed and configured:

MEMORY INFORMATION

MEMORY STATUS TABLE

Slot	Size(a+b)	Status
----	-----	-----
0a/b	64MB	Configured
1a/b	32MB	Configured
2a/b	128MB	Configured

TOTAL	224MB	

DETAILED MEMORY CONFIGURATION TABLE

SPA	GROUP	SMC	SMC Status	Bank	Bank Status	Size	Slot
----	-----	---	-----	----	-----	-----	----
0x00000000	1	0	Configured	1	Configured	64MB	2a/b
		0	Configured	3	Configured	64MB	0a/b
		0	Configured	1	Configured	64MB	2a/b
0x0c000000	0	2	Configured	0	Configured	16MB	1a/b
		2	Configured	2	Configured	16MB	1a/b

Group 1 interleaved 2 ways over 3 banks

Group 0 interleaved 2 ways over 2 banks

BAD MEMORY TABLE

SMC	SMC Status	Bank	Bank Status	SIMM Size	Slot
---	-----	----	-----	-----	----
0	Present	0	Not Present	0MB	5a/b
		2	Not Present	0MB	4a/b
1	Present	0	Not Present	0MB	5a/b
		2	Not Present	0MB	4a/b
		3	Not Present	0MB	0a/b
2	Present	1	Not Present	0MB	3a/b
		3	Not Present	0MB	3a/b

Active, installed memory (bytes) : 234881024
of Standard DRAM

Deallocated pages (bytes) : - 0

Available Memory (bytes) : 234881024

Good Memory Required by OS (bytes): 0
(Not Set by OS)

Memory

HVERSION SVERSION

0x0710 0x0900

Memory Information Sample 2

The following sample shows the memory information when memory modules are not properly installed and configured. In this sample the memory module in memory slot 1A is missing.

MEMORY INFORMATION

WARNING: Memory has been reconfigured due to a physical change or because the

Page Deallocation Table (PDT) was cleared. This is for information only. No action is required.

MEMORY STATUS TABLE

Slot	Size(a+b)	Status
0a/b	64MB	Configured
1a/b	??MB	SIMM not seated properly.
2a/b	128MB	Configured
TOTAL	192MB	

DETAILED MEMORY CONFIGURATION TABLE

SPA	GROUP	SMC	SMC	Status	Bank	Bank	Status	Size	Slot
0x00000000	0	0	0	Configured	1	Configured	64MB	2a/b	
			0	Configured	3	Configured	64MB	0a/b	
			1	Configured	1	Configured	64MB	2a/b	

Group 0 interleaved 2 ways over 3 banks

BAD MEMORY TABLE

SMC	SMC Status	Bank	Bank Status	SIMM Size	Slot
---	-----	----	-----	-----	----
0	Present	0	Not Present	0MB	5a/b
		2	Not Present	0MB	4a/b
1	Present	0	Not Present	0MB	5a/b
		2	Not Present	0MB	4a/b
		3	Not Present	0MB	0a/b
2	Present	0	Sizing Error	0MB	1a/b
		1	Not Present	0MB	3a/b
		2	Sizing Error	0MB	1a/b
		3	Not Present	0MB	3a/b

Active, installed memory (bytes) : 201326592
of Standard DRAM

Deallocated pages (bytes) - 0

Available Memory (bytes) : 201326592

Good Memory Required by OS (bytes): 0
(Not Set by OS)

Memory

HVERSION SVERSION

0x0710 0x0900

Displaying the Status of the System I/O

The IO command lets you identify all built-in I/O devices and optional I/O devices installed in the option slots. It is available in the Information Menu.

To use the IO command from the Information Menu of the boot console interface, type:

Information Menu: Enter command > **IO**

Information about the built-in and optional I/O devices is displayed.

I/O MODULE INFORMATION

IODC IODC

Path	Decimal	Type	Location	HVER	SVER	Vers	Dep
8/0	8/0	Bus Bridge	built-in	6800	0a00	0x00	0x00
FWSCSI	8/12	A DMA I/O	built-in	03b0	8980	0x96	0x00
8/16	8/16	Bus Adapter	built-in	03b0	8100	0x00	0x00
8/16/0	8/16/0	Parallel	built-in	03b0	7400	0x00	0x00
8/16/1	8/16/1	Audio	built-in	03b4	7b00	0x00	0x00
SERIAL_1	8/16/4	RS232	built-in	03b0	8c00	0x01	0x00
SESCSI	8/16/5	SE SCSI	built-in	03b0	8200	0x96	0x00
LAN	8/16/6	LAN	built-in	03b0	8a00	0x02	0x00
PS2	8/16/7	Keyboard	built-in	03b0	8400	0x00	0x00
8/16/8	8/16/8	Mouse	built-in	03b0	8400	0x00	0x00


```

8/16/10 8/16/10 Floppy    built-in  03b0 8300 0x00 0x00
8/20  8/20   Bus Adapter built-in  0170 8e00 0x00 0x00
SERIAL_2 8/20/2 RS232 Port built-in  0170 8c00 0x00 0x00
EISA  8/20/5 Bus Adapter built-in  0170 9000 0x00 0x00
GRAPHICS(0) 8/24 INTERNAL_EG_X128 built-in 0160 8500 0x01
0x00
8/63  8/63  Bus Converter built-in  5011 0c00 0x00 0x00
10/63 10/63 Bus Converter built-in  5011 0c00 0x00 0x00

```

EISA Cards

Path	Type	EISA ID
----	----	-----
8/20/5/1	EISA	slot is empty
8/20/5/2	EISA	slot is empty
8/20/5/3	EISA	slot is empty

PCI Cards

Slot	Path	Bus	Class

Setting the Auto Boot and Auto Search Flags

auto boot and **auto search** are variables stored in your workstation's nonvolatile memory. (Nonvolatile memory retains its contents even after power is turned off.) If you reset these flags to new value, the change takes effect the next time you reboot the workstation.

auto boot boots the operating system whenever your workstation is turned on.

To examine the state of the **auto boot** and **auto search** flags, type the following at the prompt:

```
Configuration Menu: Enter command > auto
```

If **auto boot** is set to **on**, your workstation automatically attempts to boot the operating system when turned on. If **auto boot** is set to **off**, your workstation enters the boot administration mode of the boot console user interface.

The state of the **auto search** flag determines how your workstation seeks a boot device during autoboot. If **auto search** is set to **on**, your workstation will search for other boot devices if the primary boot device is not available. If **auto search** is **off**, your workstation will default to the boot administration mode if it can't see the primary boot device.

To change the state of the **auto boot** or **auto search** flags, type the following at the prompt:

```
Configuration Menu: Enter command > auto boot  
state
```

or

```
Configuration Menu: Enter command > auto  
search state
```

where *state* is **on** or **off**.

Autosearch searches for devices in the following order:

Primary boot path

Alternate boot path

Built-in fast, wide SCSI devices

Built-in single-ended SCSI devices

Built-in LAN bootp servers



NOTICE: Fast wide SCSI adapter option cards installed in the option slots are not searched unless they are referenced by the primary or alternate boot paths. EISA cards are not searched.

Displaying and Setting the Security Mode

The **SECure flag** is a variable stored in non-volatile memory. (Non-volatile memory retains its contents even after power is turned off.) If you reset this flag to a new value, the change takes effect the next time you reboot the workstation.

When the **SECure flag** is set to **on**, **autoboot** and **autosearch** are enabled and cannot be stopped. The system boots from the default boot paths regardless of user intervention.

To display the current setting for the **SECure flag**, enter the following command:

```
secure
```

To set the **SECure flag on** or **off**, enter one of the following:

```
secure on
```

```
secure off
```

Displaying and Setting the Fastboot Mode

When **fastboot** is enabled (set to **on**), your workstation does a quick check of the memory and skips I/O interface testing during its power-on self tests. This enables your workstation to complete its boot process quicker. The default factory setting is for **fastboot** to be enabled (**on**).

The **fastboot** mode allows your workstation to boot quickly by performing a less extensive check of the system's memory.

When **fastboot** is disabled (set to **off**), more extensive memory testing and I/O interface testing is performed during the self tests, causing the boot process to take longer.

If you are experiencing difficulty in booting your workstation, set **fastboot** to **off** and reboot the system. The more extensive testing may reveal the error condition.

To display the status of **fastboot**, type the following at the prompt:

Configuration Menu: Enter command > **fastboot**

To disable **fastboot**, type the following at the prompt:

Configuration Menu: Enter command > **fastboot off**

To enable **fastboot**, type the following at the prompt:

Configuration Menu: Enter command > **fastboot on**

Displaying the LAN Station Address

It is sometimes necessary to supply a LAN station address of your workstation to other users. For example, if your workstation is to become a member of a cluster, the cluster administrator needs to know your LAN station address in order to add your workstation to the cluster.

A LAN station address of your workstation is the label that uniquely identifies the LAN connection for your workstation at the link level (the hardware level).

To display your workstation's LAN station addresses, type the following at the prompt:

Information Menu: Enter command > **lanaddress**

The LAN station address is displayed as a twelve-digit number in hexadecimal notation, similar to the following:

```
LAN Station Addresses:      080009-789abc
```

The address is for the system's built-in LAN.

Configure and Display LAN Settings (J2240 Only)

The LanConfig command configures and displays the current LAN settings. The hardware system supports 10Base-T, 100Base-T and AUI standards.

To automatically select the network speed (100 Mbits/sec) and data transfer operation (full or half duplex), operating in compliance with IEEE 802.3u, (this is the default and recommended setting) type the following at the prompt:

Configuration Menu: Enter command > **LanConfig AUTO**

To select 10 Mbits/sec network speed and half duplex mode, type the following at the prompt:

Configuration Menu: Enter command > **LanConfig
10/Half_dx**

To select 10 Mb/s network speed and full duplex mode, type the following at the prompt:

Configuration Menu: Enter command > **LanConfig**
10/Full_dx

To select 100 Mb/s network speed and half duplex mode, type the following at the prompt:

Configuration Menu: Enter command > **LanConfig**
100/Half_dx

To select 100 Mb/s network speed and full duplex mode, type the following at the prompt:

Configuration Menu: Enter command > **LanConfig**
100/Full_dx

To select the AUI port (10 Mb/s, half duplex only), type the following at the prompt:

Configuration Menu: Enter command > **LanConfig AUI**



NOTICE: The LAN setting defaults to LAN-TP(RJ45). If that setting fails, the system tries the LAN-AUI setting. Also note that the new lan configuration settings take effect at the next Bboot or SEARCH command.

Displaying System Information

The **all** command allows you to display the system's processor revision and speed, cache size, memory size, flag settings, and the boot and console paths. To display system information from the Information Menu, type the following at the prompt:

Information Menu: Enter command > **all**

This information is paged to allow you to view it as necessary.

Displaying PIM Information

The **pim** command allows you to display the most recent PIM information for the specified fault type. To display PIM information for a specific fault, from the Service Menu, type the following at the prompt:

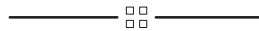
Service Menu: Enter command > **pim** *processor_number*

You can use **pim** in the following ways:

pim – gives all fault types

pim *0* – HPMC information on processor

pim *0 fault_type* – fault type information on processor



Glossary

absolute pathname

The full pathname of a file, including all the directories leading to it, starting with the root directory (“/”) and ending with the filename itself. *See also* **file**, **filename**, **pathname**.

access permissions

Settings that allow a user or group of users to read, write, or execute files. *See also* **file access permissions**.

active window

The window that is receiving input from the keyboard at the present time. If there is no active window, anything you type is lost. Only one window can be active at a time. The active window is said to have the “keyboard focus.”

ANSI

The American National Standards Institute, a non-profit organization, made up of various expert committees, that publishes standards for use by national industries. ANSI has adopted the IEEE standards for local area networks.

argument

The part of a command line that identifies the file or directory to be acted on.

attachment unit interface (AUI)

A transceiver cable that conforms to IEEE 802.3 specifications.

back up

v. To make a copy of the file system on a tape or disk that can be stored separately from the original files. Also called “backing up the system” or simply “system backup.”

bitmap

Generally speaking, an array of data bits used for graphic images. Strictly speaking, a pixmap of depth one, capable of representing 2-color images.

boot

Short for bootstrap service. A service provided by a short program, stored in the read-only memory of your workstation, that loads the operating system (or any complex program) into main memory. Partner workstations provide bootstrap service to diskless workstations. *See also* **boot ROM**.

boot console interface

The interactive program that enables you to interact with the hardware of your workstation before the workstation boots the operating system. The boot console interface allows you to perform special tasks, display information, and set certain system parameters.

boot ROM

A read-only memory that is incorporated into a workstation for the purpose of starting the operating system, testing the terminal, and producing a standard display.

bootstrap service

See boot.

byte

A fundamental character–code unit, usually consisting of 8 bits.

CD–ROM

Compact Disc Read–Only Memory. *See also* **CD–ROM disc**, **CD–ROM drive**.

CD–ROM disc

CD–ROM discs are identical to the audio compact discs (CDs) used to record stereo music, except that they store data. CD–ROM discs are 120 mm (4.7 inches) in diameter, and use one data surface with a capacity of 600 MB. The data surface contains pits and flat spots arranged in a continuous spiral track, which is read at a constant speed.

CD–ROM drive

A random–access, read–only, mass–storage device that uses removable CD–ROM discs. The drive contains a semiconductor laser for reading data optically and an embedded controller with a SCSI interface.

Central Processing Unit (CPU)

The part of a workstation that interprets and executes instructions.

child directory

See subdirectory.

click

To press *and release* a mouse button. The term comes from the fact that pressing and releasing most mouse buttons makes a clicking sound.

cluster

A group of workstations connected via a Local Area Network (LAN). One workstation, the cluster server, performs as a file-system server for the cluster clients. *See also* **cluster client**, **cluster node**, **cluster server**.

cluster client

A cluster node that does not have a local HP-UX file system. Its file system resides on the cluster server. *See also* **cluster**, **cluster node**, **cluster server**.

cluster node

A member of a group of workstations connected via a Local Area Network (LAN). One workstation, the cluster server, performs as a server to the cluster. *See also* **cluster**, **cluster client**, **cluster server**.

cluster server

A workstation that provides file access, login access, file transfer, printing, and other services across a network to a defined cluster of systems (cluster nodes) connected via a LAN. *See also* **cluster**, **cluster client**, **cluster node**, **host**.

command

An instruction that you enter into the system at a prompt, to execute a program or perform a task. *See also* **shell command**.

command argument

Information you provide on a command line to describe the object (usually a file or directory) to be operated on by the command.

command interpreter

A program that reads lines of text from standard input (typed at the keyboard or read from a file) and interprets them as requests to execute other programs. An HP-UX command interpreter is called a shell. *See also* **shell**.

command option

Information you provide on a command line to indicate any special action you want the command to take. *See also* **default**.

configuration

The arrangement of a workstation or network as defined by the nature, number, and chief characteristics of its functional units. More specifically, the term configuration may refer to a hardware configuration or a software configuration.

control key sequence

A keystroke combination used as a shorthand way of specifying commands. To enter a control key sequence, you hold down the control key while pressing another key.

cpu

See **Central Processing Unit**.

current directory

See **current working directory**.

current session

The work and processes that have been created since you logged into the system (and before you log out again). *See also* **session**.

current working directory

The directory in which a relative path name search begins, as well as the directory in which you are currently working. It is also called the working directory or current directory.

cursor

The small blinking box displayed in whatever screen is active at a particular time. The cursor marks your current typing position on the screen and indicates which program (HP VUE terminal window or shell) will receive your commands.

daisy-chaining

A method of connecting devices where the signal passes from one device to the next in serial fashion along a bus.

DDS tape drive

A device that stores data on Digital Data Storage (DDS) cassettes.

default

Most commands give you a choice of one or more options. If you don't specify an option, the command automatically assigns one. This automatic option is called the default. *See also* **command option**.

dialog box

A special type of HP VUE screen that is called by the user from a window. Dialog boxes contain controls and settings. To display an example of a dialog box, click the Style Manager button on the Workspace, then click on Color.

directory

A special type of object that contains information about the objects beneath it in the HP-UX organizational structure. Basically, it is a file that stores names and links to files and other directories. *See also* **file**.

disk

A thin, round plate with a magnetic surface coating on which data is stored by magnetic recording. *See also* **floppy diskette, hard disk, CD-ROM disc**.

disked workstation

A workstation that has its own hard disk drive. *See also* **diskless workstation, node, partner node, workstation**.

diskette

See **floppy diskette**.

diskless booting

Loading the operating system into local memory from the disk of a partner workstation.

diskless workstation

A workstation that has no disk. A diskless workstation can use the disk of its partner workstation or other workstations. If necessary, it can also use the computational services of the partner workstation or other workstations. A diskless workstation boots from its partner workstation. *See also* **disked workstation, node, partner node, workstation**.

double click

To press and release a mouse button twice in rapid succession.

drag

To press and hold down a mouse button while moving the mouse (and the pointer on the screen). *See also* **drop**.

drive

See **CD-ROM drive, DDS tape drive, floppy drive, hard disk drive**.

drop

To release an icon that has been “dragged” to a new position. *See also* **drag**.

environment

The conditions under which your commands are executed. These conditions include your workstation characteristics, home directory, and default search paths. *See also* **environment variables**.

environment variables

The set of defined shell variables (some of which are PATH, TERM, SHELL, EXINIT, HOME) that define the conditions under which your commands are executed. These conditions include your workstation characteristics, home directory, and default search paths. *See also* **environment**.

ETHERNET

The LAN developed jointly by Digital Equipment Corporation, Intel, and Xerox Corporation, upon which the IEEE 802.3 network is based.

Extended Industry Standard Architecture (EISA)

An industry standard bus architecture based on and compatible with that used by IBM in their AT series computers.

fast, wide SCSI

A 16-bit wide bus with high-power receivers and drivers, which allows a cable length of up to 25 meters and a speed of up to 20 MB per second. *See also* **single-ended standard SCSI, Small Computer System Interface**.

file

The basic named unit of data stored on disk. *See also* **directory, filename**.

file access permissions

The access rights given to a particular file or directory. Every file and directory has a set of access permissions, a code that determines whether a process can perform a requested operation on the file (such as opening the file or writing to it). *See also* **access permissions**.

File Manager

The HP VUE application that allows you to manage your files and directories, and to set viewing preferences.

filename

The name given to a particular file. *See also* **absolute pathname, file, pathname**.

file server

A workstation whose primary task is to control the storage and retrieval of data from hard disks. Any number of other workstations can be linked to the file server in order to use it to access data.

file system

The organized set of files and directories on a hard disk.

floppy diskette

A thin, record-shaped plate that stores data on its magnetic surfaces. The system uses heads (similar to heads in tape recorders) to read and write data on concentric disk tracks.

floppy drive

A device that stores data on a flexible diskette.

hard disk

A type of disk that is rigid as opposed to a floppy diskette, which is flexible.

hard disk drive

A device that stores data on a hard disk. The hard disk is a permanent part of the drive and cannot be removed.

Help Manager

The HP VUE application that provides online help.

\$HOME

The environment variable representing the home directory. This is the directory in which you are placed after you log in. Typically, this is */users/login*, where *login* is your username. *See also* **home directory**.

home directory

A shorthand way of referring to a frequently used directory, almost always the login directory.

host

See cluster server.

host name

See internet protocol address.

HP-UX cluster

See cluster node, cluster server.

HP Visual User Environment

A user interface that draws a graphical layer over the complexities of the other layers of the system (the hardware, operating system, and X Window system), enabling you to control your workstation by directly manipulating graphical objects instead of by typing commands at a command-line prompt.

HP VUE

See HP Visual User Environment.

icon

A small, graphic representation of an object. Objects can be “iconized” (turned into icons) to clear a cluttered workspace. Icons can be restored to their original appearance when needed. Whatever processes are executing in an object continue to execute when the object is iconized.

iconify

See iconize.

iconize

To turn a window or shell into an icon. *See also icon.*

Initial System Loader

The program that actually controls the loading of the operating system.

input device

Any of several pieces of hardware equipment used to give information to a system. Examples are the keyboard and the mouse. *See also output device.*

input window

The window that displays a program's prompt and any commands typed but not yet executed.

internet protocol address (IP address)

A string of characters that uniquely identifies a workstation in a network. Also referred to as the IP address, the system name, and the host name.

invisible filename

A filename in which the first character is a dot (.). Invisible filenames are not displayed by the listing commands such as **ls** and **ll** without add options, such as **-a**.

IP address

See internet protocol address.

ISL

See Initial System Loader.

kernel

The part of the operating system that is an executable piece of code responsible for managing the computer's resources. The kernel controls the rest of the operating system.

LAN

See local area network.

LAN station address

See local area network station address.

link

n. A special object that contains the name of another object. When you specify a link as a pathname or part of a pathname, the system substitutes the pathname that the link contains.

v. To join together two or more objects.

local area network (LAN)

A data communications system that allows a number of independent devices to communicate with each other. The systems and clusters that share data, hardware, and software resources via Networking Services software.

local area network station address

The label that uniquely identifies the local area network (LAN) connection for your workstation at the hardware level.

log in

To initially sign on to the system so that you may begin to use it. This creates your first user process. *See also* **username**.

login directory

The directory in which you are placed when you log in, usually your home directory. *See also* **home directory**.

Login Manager

The program that controls the initial startup of HP VUE and accepts the user's username and password.

login script

The shell program that runs at each login, and sets the login environment for your system.

menu bar

An area at the top or bottom of a window that contain the titles of the pull-down or pop-up menus for that application.

minimize button

In HP VUE, a push button on the window frame that turns a screen into an icon. *See also* **icon**, **iconize**.

mouse pointer

See pointer.

name

A character string associated with a file, directory, or link. A name can include various alphanumeric characters, but never a slash (/) or null character. *See also pathname.*

network

Two or more workstations sharing information. *See also cluster, workstation.*

network controller

A printed circuit board that passes bit streams between the network and the main memory of the workstation. Coupled with the network transceiver, the controller also handles signal processing, encoding, and network media access.

node

A network computer (workstation). Each node in the network can use the data, programs, and devices of other network nodes. Each node contains main memory and has its own disk or shares one with another node. *See also disked workstation, diskless workstation, workstation.*

node name

A unique identifying name given to a workstation in a cluster. *See also cluster, node.*

nonvolatile memory

System memory that retains its contents even after workstation power is turned off.

object

Any file, directory, or link in the network. *See also* **directory**, **file**, **link**, **pathname**.

operating system

The program that supervises the execution of other programs on your workstation. For example, the entire HP-UX system, including the kernel and all HP-UX commands. *See also* **kernel**.

option

See **command option**.

output device

Any of several pieces of hardware used for receiving messages from the workstation. Display screens and printers are examples of output devices. *See also* **input device**.

output window

The window that displays a process response to your command.

parent directory

A directory that contains other directories, each of which is then called a subdirectory. *See also* **subdirectory**.

partner node

A workstation that shares its disk with a diskless node. *See also* **diskless workstation**.

password

The word you enter next to the password prompt at login time. Keep your password secret and change it occasionally in order to protect your account from unauthorized use. *See also* **user account**.

path

The hardware address of a device that is attached to the I/O system of your workstation.

pathname

A series of names separated by slashes that describe the path of the operating system from some starting point in the network to a destination object. Pathnames begin with the name of the starting point, and include every directory name between the starting point and the destination object. A pathname ends with the name of the destination object. *See also* **name, object**.

permissions

A set of rights (read, write, execute) associated with an object in the file system. Determines who may use the object.

PID

Process Identification. Also referred to as a process ID. *See also* **process ID**.

pointer

Sometimes called the “mouse pointer,” the pointer shows the mouse location on the screen. The pointer’s shape depends on its location. In the HP VUE Workspace, the pointer is an X. On a window frame, the pointer is an arrow.

process

A computing environment in which you may execute programs; a program currently running in the system.

process ID

A unique identification number assigned to all processes by the operating system. Also referred to as a PID. *See also* **PID**.

program

A unit of executable code, in binary or “source” form. Most HP-UX commands and routines consist of programs.

prompt

A message or symbol displayed by the system to let you know that it is ready for your input.

push button

A graphic control that simulates a real-life push button. Use the pointer and mouse to push the button and immediately start an action.

RAM

Random access memory.

ROM

Read-only memory.

root

See **superuser**.

scroll bar

A vertical or horizontal bar located on the side or bottom of a window that allows the user to view information that does not fit within the window.

SCSI

See **Small Computer System Interface**.

server

A program that controls all access to input and output devices.

session

The time between when you log in and when you log out. Also called a work session or a login session. *See also* **current session**.

shell

A command-line interpreter program used to invoke utility programs. Some examples of HP-UX shells are the Bourne, Korn, Key, and C shells. Sometimes referred to as a command interpreter. *See also* **command interpreter**.

shell command

An instruction you give the system to execute a utility program or shell script. *See also* **shell script, utility program**.

shell script

A file that contains commands that the system can interpret and run in a shell.

shutdown

The process of taking the system from multi-user state to system administration state.

SIMM

See **Single In-line Memory Module**.

single-ended standard SCSI

An 8-bit wide SCSI bus with standard receivers and drivers, which limits total cable length to 6 meters. *See also* **fast, wide SCSI**, **Small Computer System Interface**.

Single In-line Memory Module

A memory board.

slider

One of the components of a scroll bar. The slider is the object that is dragged along the scroll area to cause a change.

Small Computer System Interface (SCSI)

An IEEE standard for interfacing a computer to multiple, disparate high-speed peripherals such as a floppy disk or a CD-ROM, singly or in combination. *See also* **fast, wide SCSI**, **single-ended standard SCSI**.

standalone

A workstation that is not part of a cluster. *See also* **cluster**.

Style Manager

The HP VUE application that provides the ability to customize various aspects of your system, including colors, fonts, the keyboard, the mouse, session startup and termination behavior, and access to other workstations.

subdirectory

A directory that is located in, or anywhere on a path below, another directory. The directory above the subdirectory is called the parent directory. The subdirectory is also referred to as the child directory. *See also* **parent directory**.

superuser

A user with permission to enter the top-level directory and make changes to files and programs that users are not allowed to change. To “become superuser” or “become **root**” means to let the system know that you are now assuming the role of system administrator. You can do this either by logging into the system as **root**, or by typing **su** at a command-line prompt. You must know the **root** password to become **root**.

system administrator

The person responsible for system and network installation, updating, maintenance, and security at your site.

system call

Invocation of a kernel process by a user program.

system name

See **internet protocol address**.

terminal window

A terminal window is a type of HP VUE window that emulates a complete display terminal. Terminal windows are typically used to fool non-client programs into believing they are running in their favorite terminal. When not running programs or executing operating system commands, terminal windows display the command-line prompt. *See also* **HP Visual User Environment**.

title bar

The rectangular area between the top of the window and the window frame, that contains the title of the window object.

transceiver

A device that transmits and receives signals.

user account

The system administrator defines a user account for every person authorized to use the system. Each user account contains the name the computer uses to identify the person (user ID), and the person's password. User accounts also contain project and organization names, to help the system determine who can use the system and what resources each person or organization can use. *See also* **user ID, password**.

user ID

The name the computer uses to identify you. Your system administrator assigns you a user ID. Enter your user ID during the login procedure when the system displays the login prompt. *See also* **user account**.

username

The name that the system recognizes as uniquely yours. Also known as your login name. The username is also the name that identifies you to the mail system and other software requiring secure entry.

utility

See utility program.

utility program

A program provided with the operating system to perform a frequently required task, such as printing a file or displaying the contents of a directory. *See also command, shell command.*

window

A rectangular area of the screen for viewing information. HP VUE allows you to create several types of windows on the screen. Each window is a separate computing environment in which you may execute programs, edit text, or read text. *See also Workspace Manager.*

Window Manager

The HP VUE program that controls the size, placement, and operation of windows.

working directory

See current working directory.

Workspace

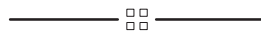
What the screen becomes when you start HP VUE. Although you can hide the workspace under terminal windows or other graphic objects, you can never position anything behind the workspace. All windows and graphic objects appear stacked on the workspace. *See also HP Visual User Environment, terminal window.*

Workspace Manager

The program that controls the size, placement, and operation of windows on the HP VUE Workspace. The Workspace Manager is a special Window Manager. *See also* **Window Manager**.

workstation

A compact, graphics-oriented computer having high speed and high memory capacity. A workstation usually includes a keyboard, a monitor, and a system unit. *See also* **node, disked workstation, diskless workstation**.



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