Model B132L/B132L+/B160L/B180L
Owner's Guide

HEWLETT ®
PACKARD

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Preface

This owner's guide describes how to use your HP 9000 B132L/B132L+/ B160L/B180L workstation.

This manual assumes that you have installed your workstation as described in the *HP 9000 Model B132L/B160L/B180L Hardware Installation Card.*

Audience

This guide is intended for HP 9000 B132L/B132L+/B160L/B180L 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.

Related Manuals

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

*   *HP 9000 Model B132L/B160L/B180L Hardware Installation Card* (A4190-90010)

*   *Using Your HP Workstation* (A2615-90003)

*   *Installing and Updating HP-UX* (B2355-90050)

*   *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)

*   *HPUX X User Environment User's Guide*

*   *Precision Architecture RISC HP 9000 Series 700 Diagnostics Manual* (92453-90010)

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
A4190-90023	E0997	First printing.

Documentation Conventions

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

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`.
literal values	Bold words or characters in formats and command descriptions represent commands or keywords that you must use literally. Pathnames are also in bold.
<u>KEY</u>	Text with a line above and a line below denotes a key on your keyboard, or a key or button which is drawn on your workstation's graphic display.
	(In this manual we refer to the **Enter** key. On your keyboard the key may be labeled either **Enter** or **Return**.)

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Problems, Questions, and Suggestions

If you have any problems, questions, or suggestions with our hardware, software, or documentation, please call 1-888-301-5932 (US & Canada) or contact the HP Response Center for your country.

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System Overview

This chapter introduces the HP 9000 B132L/B132L+/B160L/B180L workstations. Its purpose is to familiarize you with your workstation and its controls and indicators. The information is presented in the following sections:

- Product Description

- System unit front panel controls and LEDs

- System unit rear panel connectors

- Monitors

- Keyboard

- Pointing devices

- Operating system overview

- Important information you need to note

- Networking overview

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Product Description

The B Class workstations have the following key features:

- Processor Performance
    Model B132L - 132 Mhz (33 Mhz GSC)
    Model B132L+ - 132 Mhz (33 Mhz GSC)
    Model B160L - 160 Mhz (40 Mhz GSC)
    Model B180L - 180 Mhz (36 Mhz GSC)

- Operating System
    Model B132L/B160L - Native HP-UX (version 10.20 or greater)
    Model B132L+/B180L - Native HP-UX (version 10.20 or greater + ACE)

- User Interface
    HP VUE graphical user interface
    HP CDE graphical user interface

- Compatibility
    Source and binary code compatible with the Series 700 product family

- Optional Graphics:
    Model B132L/B160L - HP VISUALIZE-24Z, 24-plane graphics
                HP VISUALIZE-8/24, Accelerated 8-plane or 24-plane
                3D graphics
    Model B132L+/B180L - HP VISUALIZE-8/24/48/48XP
            HP VISUALIZE-EG/DualEG

- Main Memory
    Model B132L/B160L - 6 slots of main memory allowing 32 to 768 MBytes
    Model B132L+/B180L - 6 slots of main memory allowing 32 to 768 MBytes

- Second Level Cache
    2 slots allowing 1 MB of second level cache

- Internal Storage Devices
    3.5-inch Slimline Floppy Disk Drive (not a SCSI Device)
    Single-Ended SCSI Hard Disks (up to two)
    Single-Ended SCSI CD-ROM Drive
    Single-Ended SCSI 2.0/4.0/8.0 GB, 4-mm DDS-Format Tape Drive
    Fast, Wide SCSI Hard Disk Drives (requires optional FW SCSI adapter)

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Model B132L+/B180L only - Ultra-SCSI 2.0/4.0/9.0 GB Hard Disks

| *NOTE:* | On the Model 180L, you can install either Fast, Wide Differential SCSI or Ultra, Wide Single-Ended SCSI, but not both. |

- Standard Network
    Ethernet IEEE 802.3 AUI
    RJ45, UTP Twisted Pair
    Model B132L+/B180L only - 10Base T/100Base T

- Standard I/O
    SE SCSI Connector - 8-bit,5 MB/sec synchronous 1.5 MB/sec asynchronous 50-pin, high density SCSI connector
    Model B132L/B160L - 68-pin, high density Fast, Wide Differential SCSI connector.
    Model B132L+/B180L - 68 pin, high density Ultra, Wide Single-Ended SCSI connector.
    Two Serial Interfaces RS232C, 9-pin male
    One Parallel Interface, Centronics, BUSY handshake 25 pin female
    Audio Line-in, Line-out, Mic, and Headphone
    Two PS/2 ports (Keyboard and Mouse)

- EISA/PCI/GSC Option Slots
    Slot 1 - GSC or PCI
    Slot 2 - EISA, GSC, or PCI

- User Interface
    PS/2 Keyboard
    PS/2 Mouse

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System Unit Front Panel Controls and LEDs

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

Figure 1 shows the system unit front panel controls.
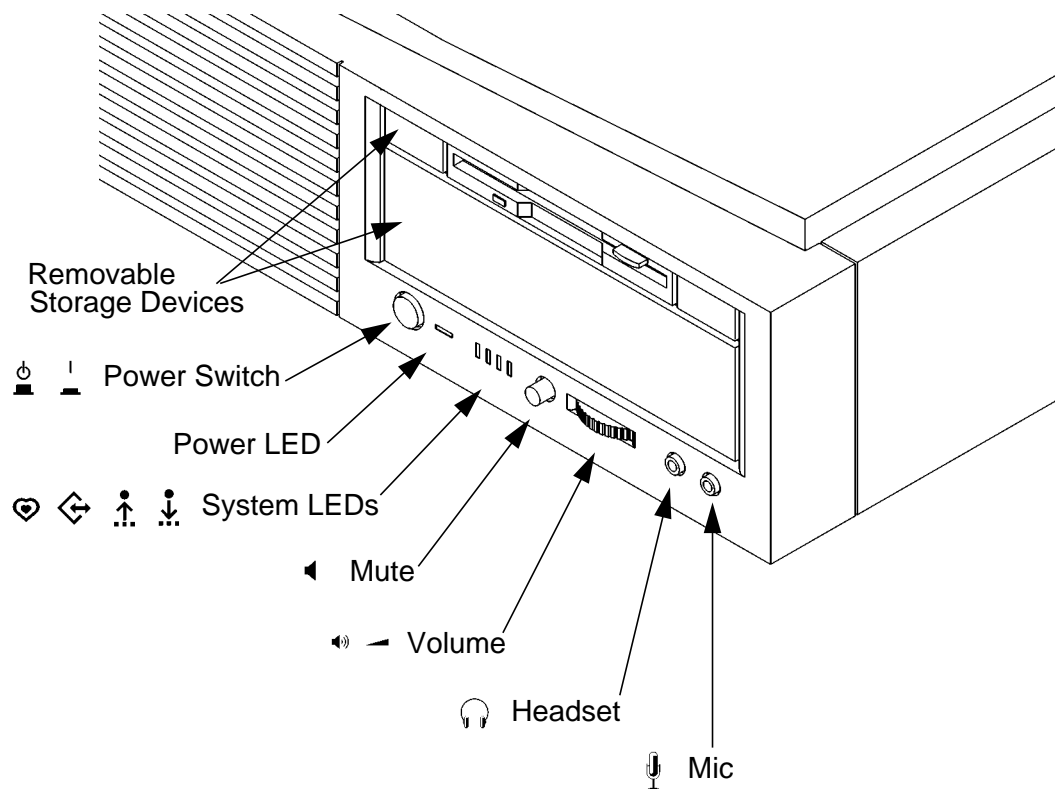
Figure 1   **System Unit Front Panel Controls**

System Power Switch

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

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.

Power LED

The Power LED lights when the system unit power is on.

System LEDs

The system LEDs indicate the status of your workstation. In the event of a system problem, the LEDs are lighted in different patterns to indicate error codes. See Chapter 6 for a complete list of the system LED error codes.

      ⬤   LED 4 - System Heartbeat

      ◇   LED 3 - SCSI Bus Activity

      ↑   LED 2 - Network Receive

      ↓   LED 1 - Network Transmit

Audio Controls

Next to the system LEDs are the following audio controls:

Headset Jack	Accommodates mini-headphones with a 3.5-mm diameter miniature stereo plug.
Volume Control	Adjusts the audio output volume to the headset jack or line out.
Mic Jack	Accommodates microphones with a 3.5-mm diameter miniature stereo plug.
Mute Button	Turns off the audio output to line out and speaker only.

NOTICE: The Volume Control, Headphone Jack, and Mic (microphone) Jack features of the CD-ROM are supported through software applications only.

For more information on the features and electrical specifications, see "Audio Connectors" later in this chapter.

Removable Storage Devices

The Models B132L/B132L+/B160L/B180L support the following removable storage devices:

- CD-ROM Disc Drive
- DDS-Format Tape Drive
- Floppy Diskette Drive

NOTICE: Due to space limitations, a DDS-format tape drive and a CD-ROM drive cannot both be mounted in the system at the same time. Also, adding either a DDS tape or CD-ROM takes on internal drive bay, leaving only one internal drive bay available for a hard disk drive.

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

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System Unit Rear Panel Connectors

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

NOTICE:

To maintain electro-magnetic and radio frequency emissions compliance, verify that all cables are fully seated and properly fastened.

Figure 2 shows the locations of the connectors on the system unit's rear panel.
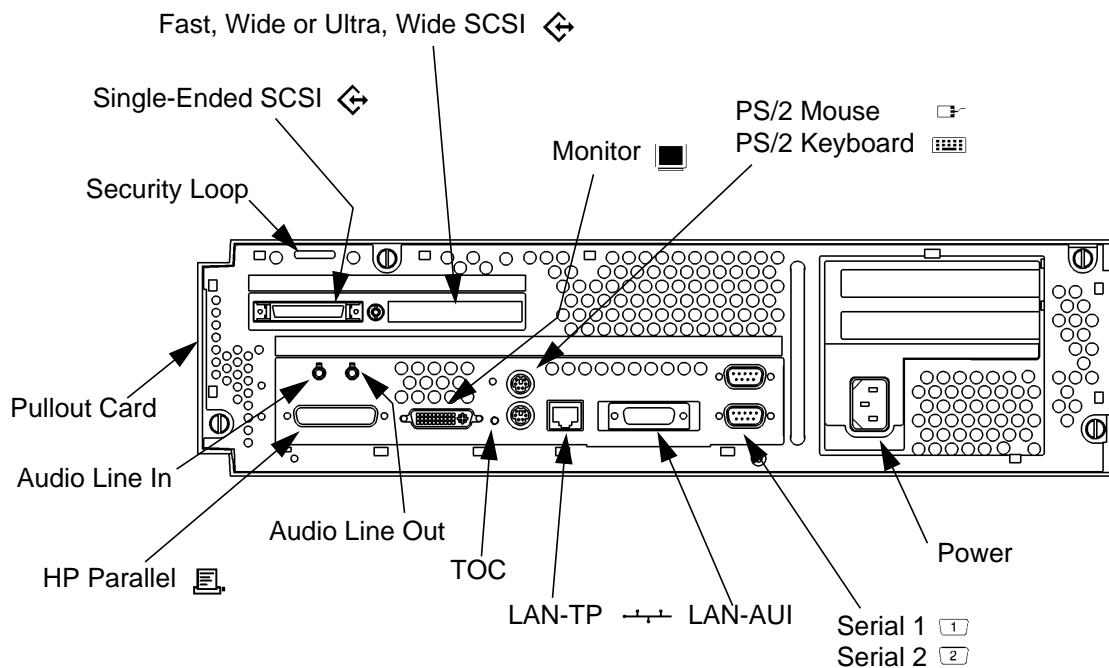
Figure 2   **System Unit Rear Panel Connectors**

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Security Loop

The security loop provides a means of locking the storage tray, with a padlock or other locking device, to prevent unauthorized removal from the system.

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) and Audio OUT (stereo line-out) connectors.

NOTICE: To maintain compliance with FCC/CISPR B you must use fully shielded, unbalanced audio cables and plugs.

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. The following is a summary of the workstation audio features:

- 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 Input

    Line In
    Mono microphone (on the front panel) compatible with
      1.5V phantom supply (bias voltage supplied by the

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system).
CD-ROM audio (if internal CD-ROM is installed)

• Audio Output

Line-out
Headphone (on the front panel)
Built-in mono speaker

• Audio CODEC

Crystal CS4215

The audio electrical specification for this workstation are summarized in Table 1

Table 1   **Audio Electrical Specifications**

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

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Table 1   **Audio Electrical Specifications**

Microphone	-73 dB

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

$$n = \left(\frac{dB}{[20\log 10]} \approx \frac{dB}{6} \right)$$

For example, for 61dB S/N then n=61/6 or approx. 10 significant bits, or in other words, about 6 bits of noise.

Keyboard Connectors

PS/2 Keyboard and Mouse Connectors

The PS/2 connectors provide an interface for a keyboard and a 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 LAN-AUI and LAN-TP (Twisted Pair) connectors for the 802.3 (ETHERNET) network. Connections to ThinLAN networks require an external transceiver. Your workstation will autoselect the correct network setting. The Models B132L+/B180L allow you to also manually select your LAN configuration.

NOTE: Only one of the network connectors can be used at one time.

Serial I/O Connectors

You can attach a variety of pointing devices (such as a mouse or trackball), or peripheral devices to the Serial Input/Output (SIO) ports on the B132L/B132L+/B160L/B180L 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 460.8K baud rate.

Table 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 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 narrow single-ended SCSI, and fast, wide differential SCSI, or ultra wide, single-ended SCSI connectors to connect external SCSI devices such as DDS-format tape drives, disk drives and CD-ROM drives. Consult the

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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 with the appropriate terminator. If there are no external SCSI devices, attach a SCSI terminator to the back of the system.

TOC Button

The TOC (transfer of control) button resets the system and transfers control from the default device to an auxiliary device.

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:

- 17-inch, 1280x1024 color monitor (A4330)

- 20-inch, 1280x1024 color monitor (A4331)

Before using your monitor you should become familiar with its controls, connectors, and indicators. For this information, consult the documentation that was packaged with your monitor.

The built-in monitor connector is an Enhanced Video Connector. An EVC to DB adapter (HP Part Number 8120-6861) is required to use older monitor types.

Keyboard

The B132L/B132L+/B160L/B180L uses a PS/2 keyboard which connects to the PS/2 interface connector on the rear of your workstation.

Pointing Devices

You can use an HP three-button mouse, a trackball, or other options as pointing devices using the PS/2 connector or 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 or CDE while using a mouse, see *Using Your HP Workstation*.

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Operating System Overview

Your B132L/B160L workstation uses the HP-UX operating system, version 10.2 or greater. Your B132L+/B180L workstation uses the HP-UX operating system, version 10.2 or greater with Additional Core Enhancements (ACE). Instant Ignition systems, (systems with preloaded software), have X-windows and Hewlett-Packard's graphical user interface, HP VUE version 3.0, installed and configured.

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

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

NOTICE: When you power on your workstation, a selftest is performed before the system boots.

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Important Information You Need to Record

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

- SCSI device ID(s)

- Device file used for each SCSI device

- 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 write it down in the space provided:

LANIC ID _____

You can also get your LANIC ID by using the lanscan command in a terminal window. To do this, follow these steps:

1   Turn your workstation and monitor on, if you have not already done so. Figure 1 of this chapter shows the location of the power switch on the workstation. See the documentation that came with your monitor for the location of the monitor power switch. Boot the HP-UX operating system.

2   In a terminal window, enter the following at the prompt:

   /usr/sbin/lanscan

You will see a table similar to Table 3.

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Table 3   **Sample LANSCAN COMMAND TABLE**

Hardware Path	Station Address	Dev lu	Hardware State	Net-Interface Name Unit State	NetMgt ID	Encapsulation Methods
2.0.2	0x0800091595EE	0	UP	lan0 UP	4	ETHER IEEE8023

The LANIC ID in this example is 0800091595EE.

You may also obtain the system's LANIC ID from the information menu in the Boot Console Handler. For detailed information see Appendix D.

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 _____

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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. If your system has man pages installed, you may read the online **telnet** 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:

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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.

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Using Your CD-ROM Drive

This chapter describes how to use your CD-ROM drive. It is divided into the following sections:

- CD-ROM drive and CD-ROM media descriptions

- Operating the CD-ROM Drive

- Mounting and unmounting a CD-ROM disc

- Troubleshooting

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

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.

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

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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 3 shows and Table 4 describes the operating controls and features of the CD-ROM drives.
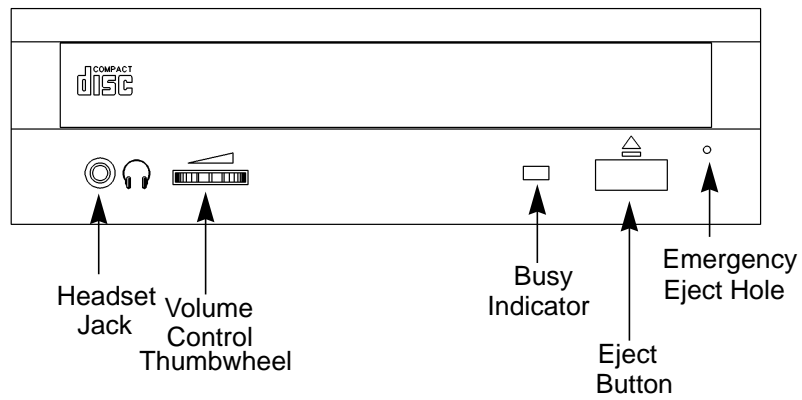
Figure 3   **CD-ROM Drive Controls and Features**

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Table 4   **CD-ROM Drive Operating Controls and Features**

Control/Feature	Purpose
Headset 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 headset jack.
Busy Indicator	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: • A defective disc • A disc insertion error (for example, an upside-down disc)
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.

NOTICE   The Volume Control, Headset Jack, and Audio Jack features of the CD-ROM drive are supported through applications only.

CD-ROM Media

CD-ROM discs are 120 mm (4.7 in.) in diameter, and use one data surface with a capacity of approximately 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.

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

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 about mounting a disc.

Operating the CD-ROM Drive

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

Loading and Unloading a CD-ROM in the Disc Tray

This subsection describes how to load or unload a CD-ROM disc in the CD-ROM drive.

Disc Tray Description

This CD-ROM is designed to be used in either the horizontal or vertical position, depending on whether your system unit is horizontal or vertical (in the floor stand). The disc tray has four spring-loaded disc holders that hold the disc in place when the CD-ROM drive is in the vertical position. When the drive is in the horizontal position, the disc holders are not used and are held out of the way by four disc holder retainers. Figure 4 shows the CD-ROM disc tray, and disc holders.
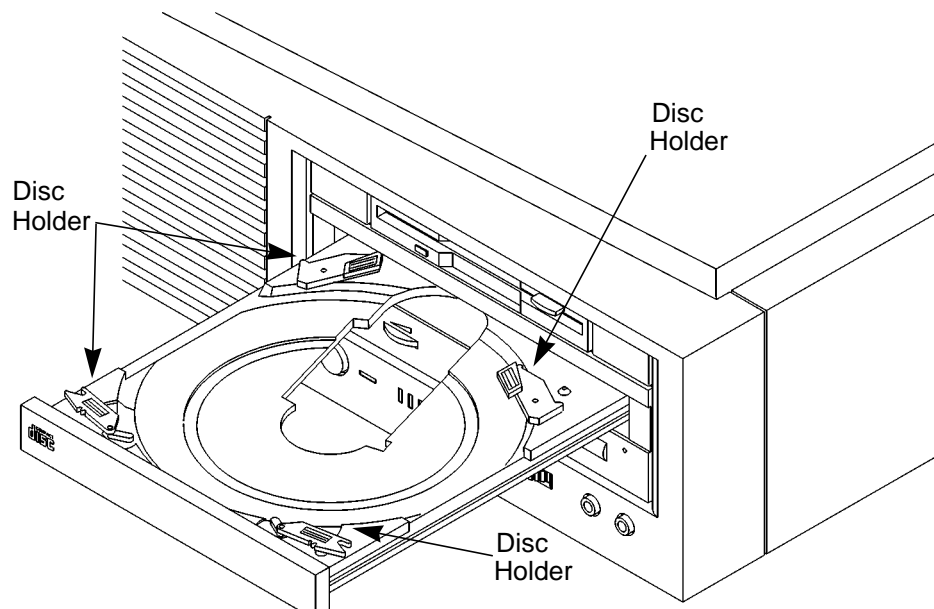
Figure 4   **CD-ROM Disc Tray**

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Loading a CD-ROM Disc in a Horizontally Mounted Drive

This CD-ROM drive has an automatic loading/ejecting feature. To load a disc in the CD-ROM drive, follow these steps:
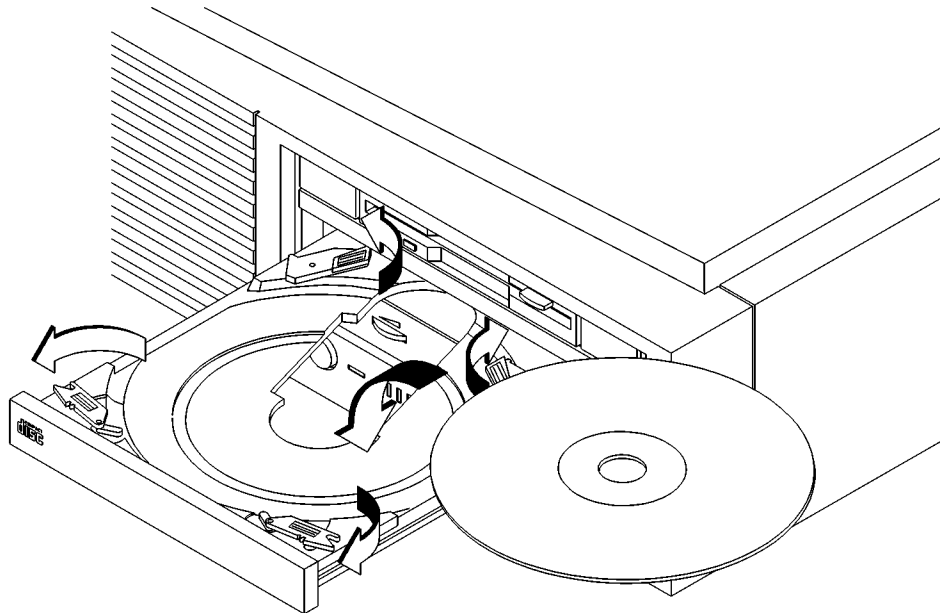
Figure 5   **Placing a CD-ROM Disc in a Horizontally Mounted Drive**

1 Check that the workstation is powered on.

2 To open the disc tray, press and release the load/eject button on the CD-ROM drive.

3 Be sure the disc holders are held away from the disc by the disc holder retainers.

4 Hold the disc by the edges with the label side up and place it in the disc tray as shown in Figure 5.

5 To close the disc tray, push the front of the disc tray gently towards the drive until it closes by itself.

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Unloading a CD-ROM Disc in a Horizontally Mounted Drive

Perform the following steps to unload a disc from the CD-ROM drive:

Figure 6   **Removing a CD-ROM Disc From a Horizontally Mounted Drive**

1   Press the eject button to eject the disc tray from the drive. If the drive is in use, you must press the eject button for more than one second to eject the disc tray.

NOTICE: You must unmount the disc before eject it from the drive. Refer to the subsection, "Unmounting a CD-ROM Disc Using SAM," for instructions on unmounting a disc.

2   Wait until the drive has fully ejected the disc tray. Be sure the disc holders are held away from the disc by the disc holder retainers, Then remove the disc from the tray as shown in Figure 6. Be careful to touch only the edges of the disc.

3   To close the Disc Tray, push the front of the disc tray gently towards the drive until it closes by itself.

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Loading a CD-ROM Disc in a Vertically Mounted Drive

To load a disc in the CD-ROM drive, follow these steps:
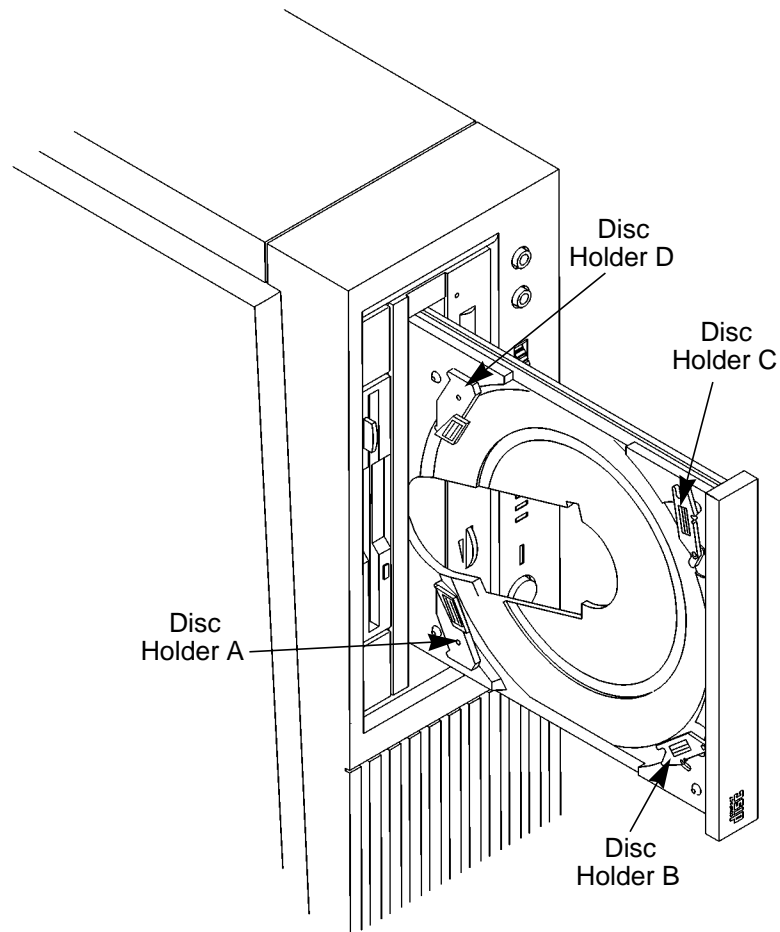
Figure 7   **Releasing the Disc Holder Retainers**

1   Make sure the three disc holders are disengaged from the disc holder retainers, as
shown in Figure 7.

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2 Hold the disc with the label side away from the tray and place the edge of the disc onto disc holders A and B as shown in Figure 8.
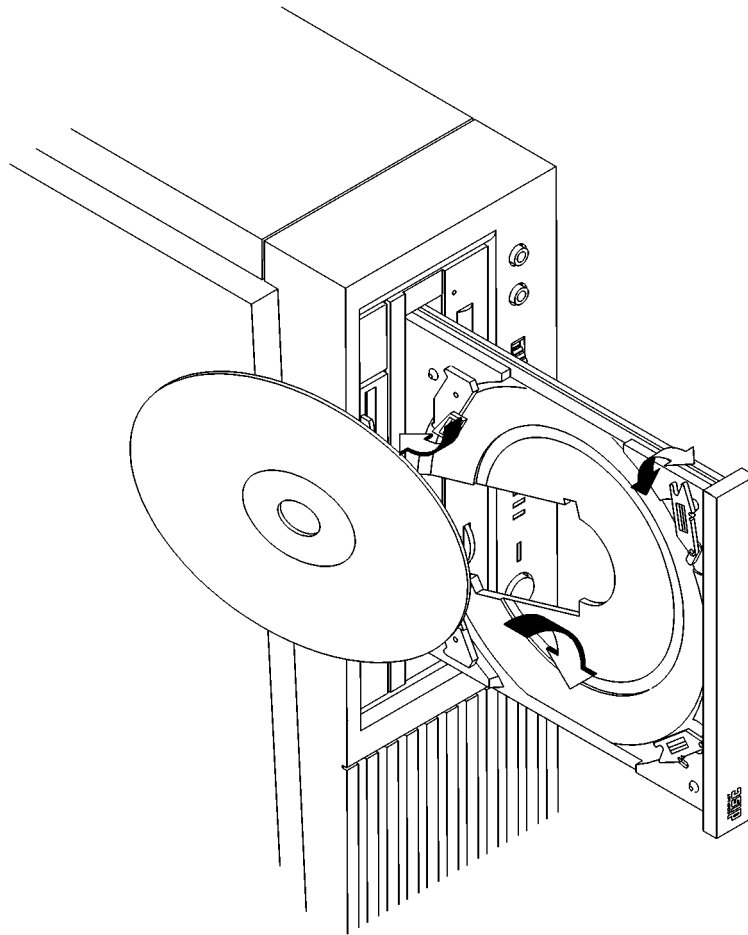
Figure 8   **Placing a CD-ROM Disc in a Vertically Mounted Drive**

3 Press down gently against the spring tension of disc holders A and B, and swing the top of the disc in until it is held by disc holders C and D.

4 To close the disc tray, push the front of the disc tray gently towards the drive until it closes by itself.

Unloading a CD-ROM Disc in a Vertically Mounted Drive

Perform the following steps to unload a disc from the CD-ROM drive:
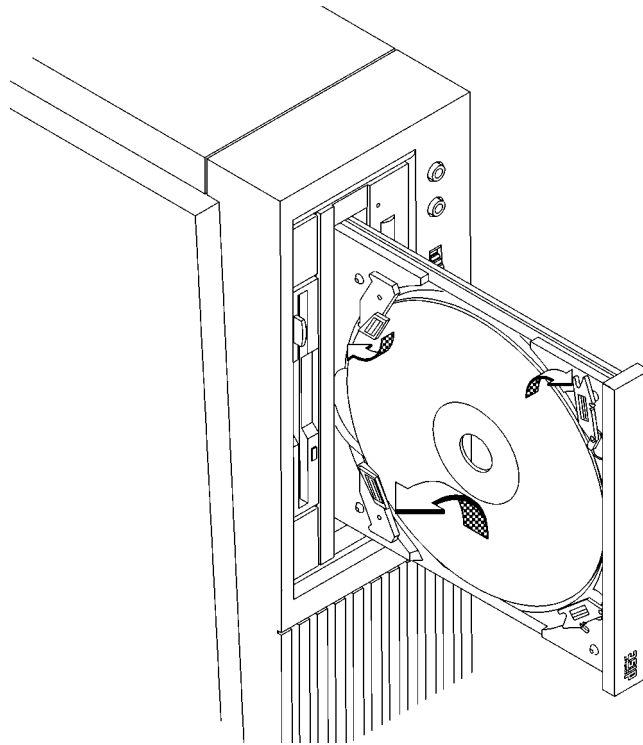
Figure 9   **Removing a CD-ROM Disc From a Vertically Mounted Drive**

1 Press the eject button to eject the disc tray from the drive. If the drive is in use, you must press the eject button for more than one second to eject the disc tray.

NOTICE: You must unmount the disc before eject it from the drive. Refer to the subsection, "Unmounting a CD-ROM Disc Using SAM," for instruction on unmounting a disc.

2 Press down gently against the spring tension of disc holders A and B and swing the top of the disc away from disc holders C and D as shown in Figure 9.

3 Remove the disc from disc holders A and B.

4 To close the Disc Tray, push the front of the disc tray gently towards the drive until it closes by itself.

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Verifying the CD-ROM Drive Operation

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

1 In a terminal window, enter the following command:

/usr/sbin/ioscan -d sdisk **RETURN**

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
8/12        ext_bus     GSC built-in Fast/Wide SCSI Interface
8/12.0      target
8/12.0.0    disk        QUANTUM LPS1080WD
8/12.5      target
8/12.5.0    disk        DEC     DSP3210SW
8/12.6      target
8/12.6.0    disk        DEC     DSP3210SW
8/16        ba         Core I/O Adapter
8/16/5      ext_bus    Built-in SCSI
8/16/5.2    target
8/16/5.2.0  disk       TOSHIBA CD-ROM XM-4101TA
8/16/5.4    target
8/16/5.4.0  disk       SEAGATE ST3600N
8/16/5.6    target
8/16/5.6.0  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 your CD-ROM drive it returns the following message:

```
        ioscan: No hardware found
```

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

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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 that can require rebooting the system.

If your workstation is running HP VUE, follow these instructions to mount and unmount a CD-ROM disc as a file system. If you're using something other than HP VUE, use the instructions for mounting and unmounting a CD-ROM disc that come with that product. For more information on configuring your CD-ROM drive, see the *System Administration Tasks* manual or online help.

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

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   **RETURN**

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 will 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 **OK**.

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

11 The following screen messages appear:

```
Task started.
Creating the device file...
Mounting file system...
Modifying "/etc/checklist"...
Task completed.
```

Click on **OK**.

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 that may 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 **RETURN**

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.

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7 A window with the following message opens:

    Do you want to remove the disk?

Click on <u>**Yes**</u>.

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).

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.

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Troubleshooting

If you have trouble with any of these procedures for using your CD-ROM drive, see Chapter 6 of this book, "Solving Problems."

3

Using Your Digital Data Storage (DDS) Tape Drive

This chapter describes how to use the optional Digital Data Storage (DDS) tape drive. It also describes how to maintain and care for the drive.

This chapter provides information on the following:

- DDS tape drive and data cassette descriptions
- Operating the DDS tape drive
- Ordering information

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

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DDS Tape Drive and Data Cassette Descriptions

This section describes basic information needed for using your DDS tape drive and data cassettes.

DDS Drive

Your DDS tape drive is either a DDS-DC (early or later model) or a DDS-2 tape drive with a 3.5-inch form factor, data compression, and a single-ended SCSI interface. Both drives incorporate data compression capability and are high-capacity, high transfer-rate devices for data storage on tape. With compression, the DDS-DC drives can store up to 4 GB of data on a 90 meter tape and the DDS-2 drive can store up to 8 GB of data on a 120 meter tape.

Storage Capacities

The maximum storage capacities of different DDS drives with and without data compression are shown in the following tables;

Table 5   **DDS Tape Drive Capacities Without Data Compression**

Tape Length	Full Height 5 1/4 DDS Tape Drive	DDS-DC Tape Drives	DDS-2 Tape Drive
60 meter	1.3 GB	1.3 GB	1.3 GB
90 meter	Not Supported	2.0 GB	2.0 GB
120 meter	Not Supported	Not Supported	4.0 GB

Table 6   **DDS Tape Drive Capacities With Data Compression**

Tape Length	Full Height 5 1/4 DDS Tape Drive	DDS-DC Tape Drives	DDS-2 Tape Drive
60 meter	2.6 GB	2.6 GB	2.6 GB
90 meter	Not Supported	4.0 GB	4.0 GB
120 meter	Not Supported	Not Supported	8.0 GB

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Controls and Indicators

Figure 10, Figure 11, and Figure 12 show the LEDs, and eject button of the DDS-format tape drives.

Cassette LED   Drive LED   Eject Button
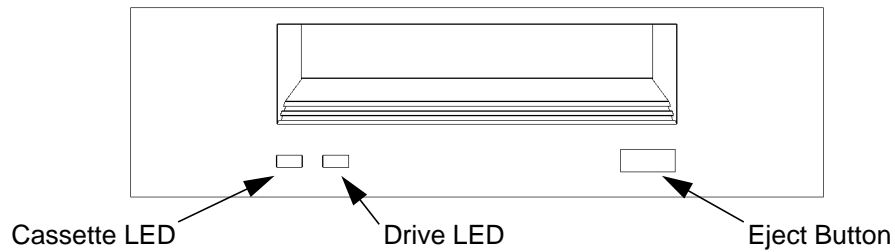
Figure 10   **DDS-DC (Early Model) Drive Controls and Indicators**

Tape   Clean   **DCLZ**

Tape LED   Clean/Attention LED   Eject Button
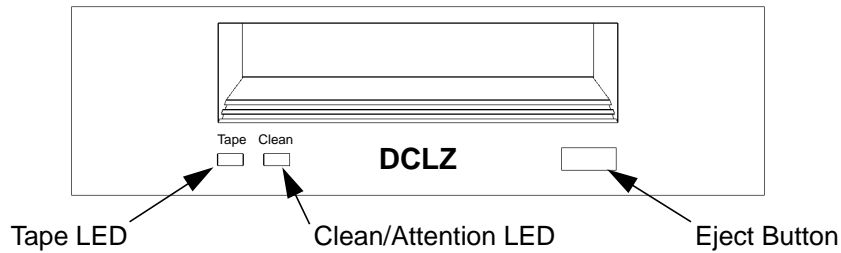
Figure 11   **DDS-DC (Later Model) Drive Controls and Indicators**

Tape   Clean

Tape LED   Clean/Attention LED   Eject Button
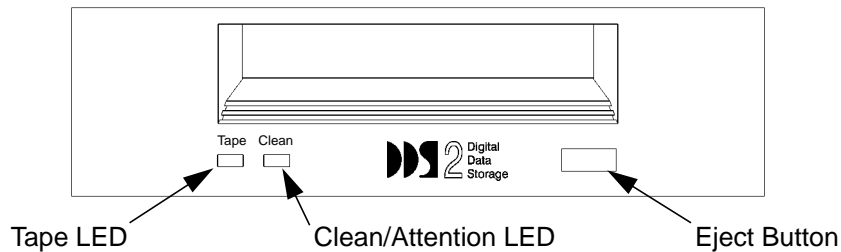
Figure 12   **DDS-2 Drive Controls and Indicators**

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LEDs

This section describes the LED codes that are displayed.

The two LEDs on the front panels of the DDS drives indicate different activities or problems that occur.

Figure 13 lists the LED codes and their meanings for the DDS-DC early model drive. Figure 14 lists the LED codes and their meanings for the DDS-DC later model and DDS-2 drives.
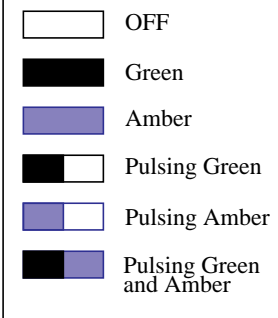
Cassette	Drive	Meaning
Read/Write States		
▰▱	▰▱	Cassette (un)loading
▰	▰	Cassette loaded/online
▰	▰▱	Cassette loaded/activity
▰	▱	Cassette loaded/offline
Write-Protect States		
▰▱	▰▱	Cassette (un)loading
▰	▰	Cassette loaded/online
▰	▰▱	Cassette loaded/activity
▰	▱	Cassette loaded/offline
Error States		
▰	▰▰	Media wear (caution)
▰	▰	High humidity
▰▱	▰▱	Self-test (normal)
▰	▰	Self-test (failure)

Key	
▱	OFF
▰	Green
▰	Amber
▰▱	Pulsing Green
▰▱	Pulsing Amber
▰▰	Pulsing Green and Amber

Figure 13   **DDS-DC (Early Model) Tape Drive LED Display Codes**

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

Figure 14   **DDS-DC (Later Model) and DDS-2 Tape Drive LED Display Codes**

LED Warning Conditions

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. 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.

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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 "Cleaning the Tape Heads," 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, back up the files to a new data cassette, then discard the data cassette.

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.

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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 DDS-format 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.

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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 15.

Push tab right for *write*.

Push tab left for *write-protect*.
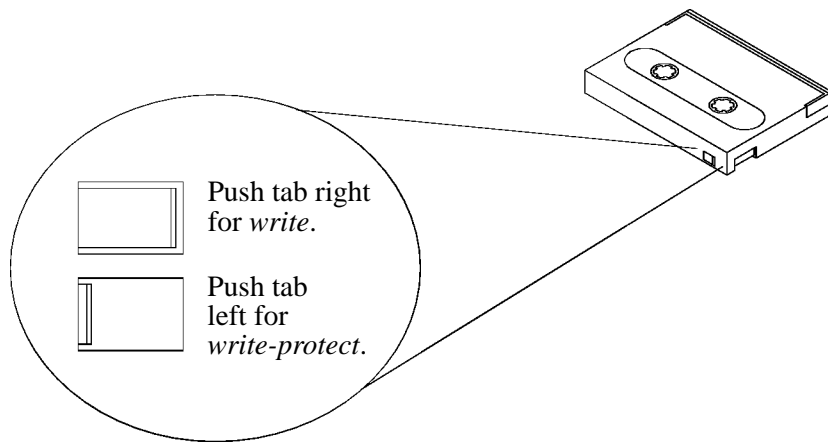
Figure 15   **Setting the Write-Protect Tab on a DDS Tape**

To protect information on a data cassette from being overwritten, set the write-protect tab to the *write-protect* position, as shown in Figure 15.

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

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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 from the DDS tape drive:

1 Insert the data cassette into the drive, as shown in Figure 16.

Eject Button
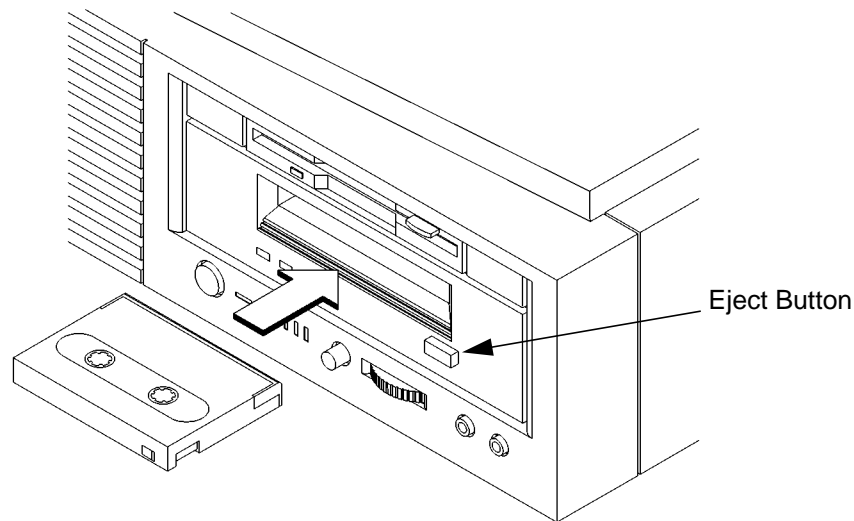
Figure 16   **Loading and Unloading a Data Cassette**

2 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.

3 To remove the data cassette, press and release the eject button on the front of the drive, as shown in Figure 16. 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.

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Verifying the DDS Tape Drive Operation

To verify that your workstation can communicate with the DDS-format tape drive, as root user, enter 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
8/16         ba                   Core I/O Adapter
8/16/5       ext_bus              Built-in SCSI
8/16/5.3     target
8/16/5.3.0   tape                 HP   HP35480A
```

If **ioscan** does not see your tape drive, it will return the following message:

```
ioscan: No hardware found
```

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

Using Device Files

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.

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

1 In a terminal window, enter the following command:

> **sam** **RETURN**

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 **Actions** 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.

Archiving Data

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.

The **tar** command allows you to save files to a data cassette, restore files from a data cassette to your system, or list the 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 you want the files to reside in.

3   Enter the following command line to restore data:

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. If the tape was made using data compression, 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 one of the device file names that **sam** listed as supporting compression.

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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

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

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*

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Troubleshooting

If you have trouble with any of these procedures for using your DDS tape drive, see Chapter 5 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
    (not supported on the DDS-DC drives)

- HP92283K - Package of two head-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.

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4

Using Your 3.5-Inch Floppy Disk Drive

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 information is organized into the following sections:

*   Using the floppy diskette

*   Operating the floppy drive

*   Troubleshooting

*   Ordering information

The instructions in this chapter assume you are using HP-UX version 9.05 or later operating system with HP VUE version 3.0 or later 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 17.

Push tab up
for *write*.

Push tab
down for
write-protect
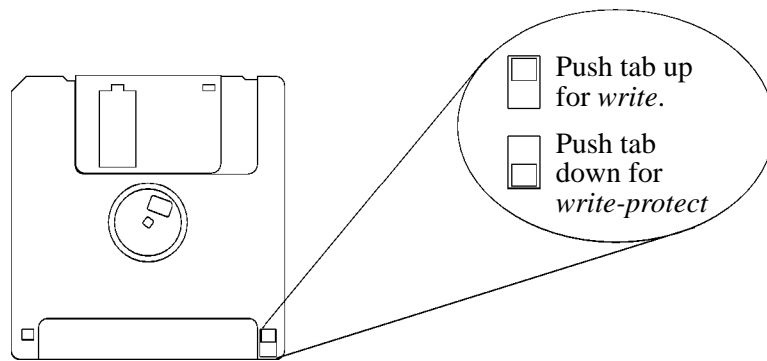
Figure 17   **Setting the Write-Protect Tab on a Floppy Diskette**

To protect files on a diskette from being overwritten, set the write-protect tab to the *write-protect* position, as shown in Figure 17.

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

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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 18.
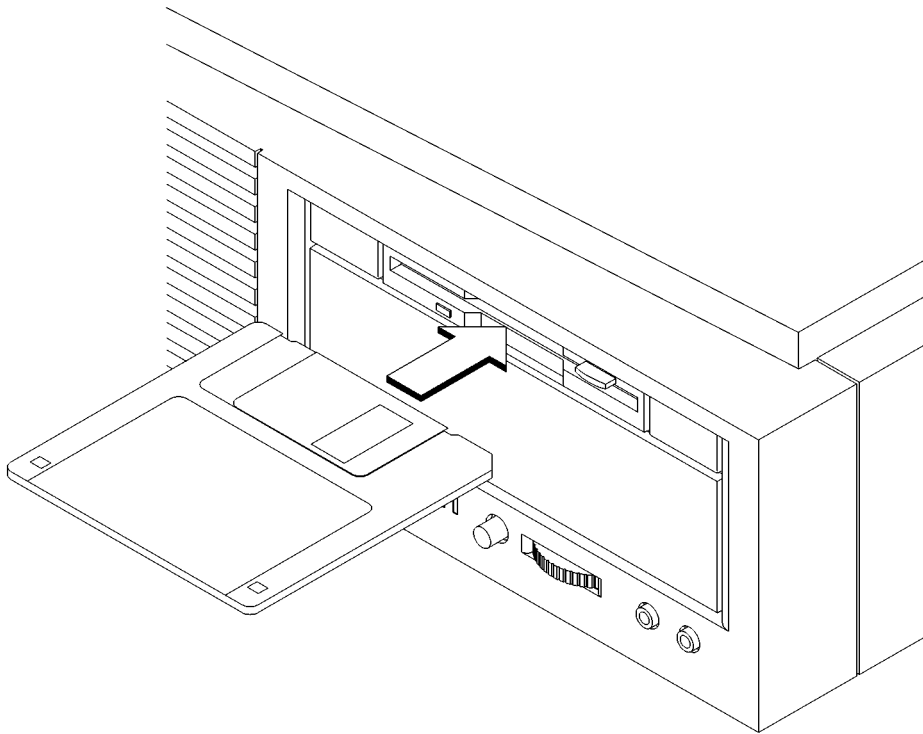
Figure 18   **Inserting and Removing a Floppy Diskette**

2   Push the diskette into the floppy drive until it clicks into place.

3   To remove the diskette, push the eject button (Figure 18), then take out the diskette.

Operating the Floppy Drive

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

Verifying the Floppy Drive Configuration

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

1   Enter the following at a command prompt:

   /sbin/ioscan

After a few moments the **ioscan** utility lists all of the I/O devices it could find. If there is a floppy drive in the list, that listing appears similar to the following:

```
H/W Path     Class          Description

==========   ===========    ===================

8            bc             I/O Adapter

8/0          graphics       Graphics

8/16/10      pc             Built-in Floppy Drive
```

Using Device Files

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.

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   RETURN

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

3   The **Disks and File Systems** window opens.

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

5   From the **Actions** menu, click on **View 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 17.

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

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.

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.

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.

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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 don't 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

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**

The man utility looks up man pages on the system.

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 the contents of 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 work-station, you need to reconfigure the HP-UX Kernel to add the floppy driver. Use the SAM utility to add the **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)

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Troubleshooting

If you have trouble with any of these procedures for using your floppy disk drive, see Chapter 6 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

5

Solving Problems

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.

This chapter is divided into the following sections:

- Common problems and solutions

- Interpreting LED error codes

- Dealing with a boot failure

- Running system verification tests

The instructions in this chapter assume you are using HP-UX version 10.2 or later operating system with HP VUE version 3.0 or later interface.

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.

Problems with Powering Up the System

Table 7 describes possible problems you may encounter when powering up the system and offers possible solutions.

Table 7   **Power Up Problems**

Problem	Solution
The power LED does not 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.
If the problem persists, contact your system administrator or call your designated service representative.	

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Problems Loading and Booting the Operating System

Table 8 describes possible problems you may encounter when loading and booting the operating system and offers solutions.

Table 8　　　　　　　　**Problems Loading and Booting the Operating System**

Problem	Solution
The power LED is lit, and text appears on the screen, but more than two minutes have passed with no sign of system activity.	Make sure that all SCSI devices are set to the proper SCSI ID. (See Appendix C for default SCSI ID settings.) 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).
The system stops or hangs while booting.	Follow the instructions in "Dealing With a Boot Failure" in this chapter.
If problem persists, contact your system administrator or call your designated service representative.	

Problems with the 802.3 Network

Table 9 describes possible problems you may encounter with the 802.3 network and offers solutions.

Table 9   **Problems with the 802.3 Network**

Problem	Solution
Cannot reach other systems on the network. Applications that rely on the network will not 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.
Network Auto-Negotiation fails. Systems cannot connect or establish link. (Models 132L+/B180)	The following can cause Auto-Negotiation failure: • Non-Category 5 cabling. Cabling must be installed by certified installers. • Improper cable termination. • Maximum cable lengths exceeded. • Incompatibility/Interoperability problems between LAN devices. Check the cabling and interfaces for proper installation and operation. If you know the speed/duplex settings for the connection device, you can also manually set the workstation LAN interface setting using the Boot Console Iterface, see "Configure and Display LAN Settings (B132L+/B180L Only)" on page 222. When the workstation fails to establish a link using the LAN-TP(RJ45) connector, the workstation automatically switches from the LAN-TP(RJ45) connector to the AUI connector. You can manually set the LAN interface to the AUI connector using the Boot Console Interface, see "Configure and Display LAN Settings (B132L+/B180L Only)" on page 222.
If problem persists, contact your system administrator or call your designated service representative.	

Problems Using a Hard Disk Drive

Table 10 describes possible problems you may encounter using the hard disk drive and offers solutions.

Table 10   **Problems Using a Hard Disk Drive**

Problem	Solution
The disk drive is not accessible or does not respond.	Make sure that all the SCSI devices are set to the proper SCSI ID. (See Appendix C for default SCSI ID settings.)
	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.)
	Make sure that the system can communicate with the drive as described in "Checking the SCSI IDs" in Appendix B.
	Follow the instructions in "Dealing With a Boot Failure" in this chapter.
If problems persist, contact your system administrator or call your designated service representative.	

Problems Using the CD-ROM Drive

Table 11 describes a possible problem you may encounter when you use the CD-ROM drive and offers a solution.

Table 11   **Problems Using the CD-ROM Drive**

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

Problems Using the DDS Tape Drive

Table 12 describes a possible problem you may encounter using the DDS tape drive and offers solutions.

Table 12   **Problems Using the DDS Tape Drive**

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

Problems Using the Floppy Disk Drive

Table 13 describes a possible problem you may encounter using the floppy disk drive and offers a solution.

Table 13   **Problems Using the Floppy Disk Drive**

Problem	Solution
The floppy drive does not respond to commands.	Re-enter the commands and make sure that you have typed them correctly.
	Make sure that you specified the correct device file for commands that require a device file name.
	Make sure that the write-protect tab is set to *write* if you are trying to copy data to a floppy diskette.
	Use a new floppy diskette.
	Follow the instructions in the section "Running the System Verification Tests" in this chapter to verify that the floppy drive is functioning properly.
If the problem persists, contact your system administrator or call your designated service representative.	

LED Error Codes

This section contains information about the error codes displayed by the LEDs on the system's front panel.

If an error occurs during the power-up diagnostics tests, the diagnostics use the front panel LEDs to display a code for the failing component.

Figure 19 shows the location of the system unit's front panel LEDs. The four amber LEDs indicate system status and error codes.

Table 14 shows the LED error codes as they appear on the front panel LEDs. Use these LED codes to determine the failing component.
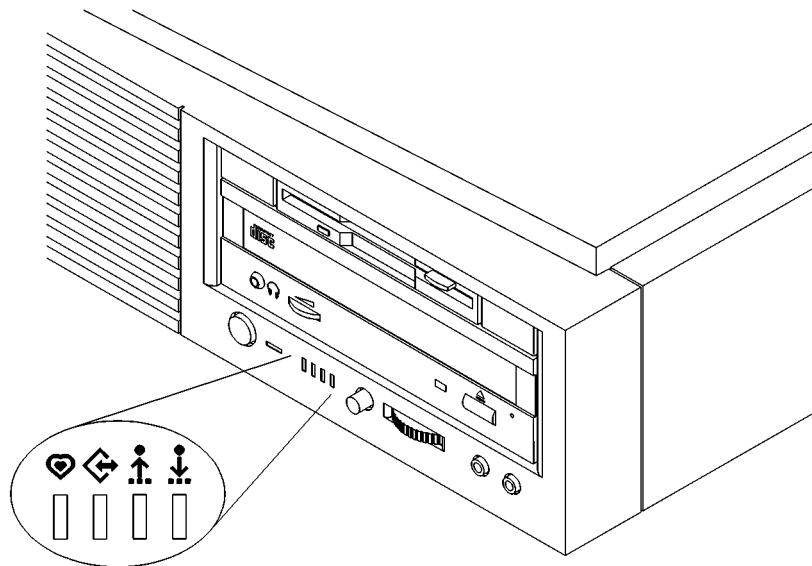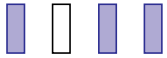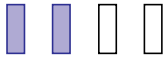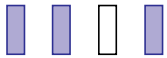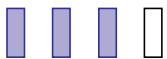
Figure 19   **System Unit Front Panel LEDs**

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Table 14   **LED Error Codes**

LED Value	RS-232 Chassis Code Range	Description
	N/A	Reserved
	7401	No memory found FAULT *Likely cause: SIMMs or processor board*
	N/A	Reserved
	FLT 7000-7F00	Memory Error Fault *Likely Cause: Memory SIMMs* *System console will indicate which SIMM fault occurred on*
	FLT 1030-4099	Processor board FAULT (includes PDH which could be on I/O board.)
	FLT 5000 - 500F FLT 8000 - 8FFF* FLT CD00 - CDFF	I/O System FAULT *Except backplane faults listed below
	FLT 8500, 8501 FLT 8C00-8CFF	Backplane FAULT (includes PCI)
	Any INIT/TEST code	INITIALIZATION and TESTING *Note: These two LED codes will alternate to indicate forward progress: 0111, 1000, 0111,...*
	Any fault not in this table including FLT 1000-101C	Unknown FAULT
	FLT CBF0 - CBFF FLT 1001	HPMC FAULT

Table 14   **LED Error Codes**

LED Value	RS-232 Chassis Code Range	Description
	FLT A088 - A0FF	No console/IPL error FAULT
	N/A	Reserved
	N/A	Reserved
	N/A	Reserved
	N/A	Power on value. Indicates processor board fault when this value remains for more than a second following power up.

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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 command >   **search ipl**

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

The search command looks for bootable media on your workstation.

3 Boot from one of the listed devices by typing 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, such as **sescsi.6.0**

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.

Running System Verification Tests

HP-UX uses an on-line diagnostics product called the Support Tools Manager that allows system operation verifications.

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 on-line man pages by entering the following at the command line prompt:

> **man cstm**

> **man mstm**

> **man xstm**

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

1 At a command line prompt, enter the following:

cstm

The following message appears:

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

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

3 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.
```

4 Press **Enter** to return to the CSTM> prompt after all test results are reported.

5 To exit the Support Tools Manager, enter the following:

CSTM> **exit**

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

Device Verification

The **ioscan** command scans the system and lists the devices that it can find. The following command line reports the device files for the devices it finds:

/usr/sbin/ioscan -fun

Enter the following command for more information on the **ioscan** command:

man ioscan

The **insf** command installs device special files for devices that it finds connected to the system. Enter the following command line to run the **insf** command:

/usr/sbin/insf

Enter the following command for more information on the **insf** command:

man insf

A

Safety and Regulatory Statements

This appendix contains safety and regulatory statements pertaining to your B132L/B132L+/B160L/B180L workstation. It provides information on the following topics:

- Declaration of conformity

- Special video configuration statements

- Emissions regulations

- Emissions regulations compliance

- Datacom users statement

- Acoustics

- Electrostatic discharge (ESD) precautions

- Safety statements

- Laser safety statements

- Warnings and cautions
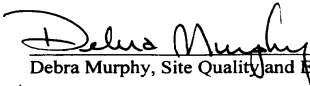
Declaration of Conformity 1

HEWLETT PACKARD

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 / B132L, B160L
Base Product Number:	A4190A
Product Options:	All

conforms to the following Product Specifications:

Safety: IEC 950:1991 + A1, A2 / EN 60950:1992 + A1, A2

EMC: CISPR 11:1990 / EN 55011:1991 Group 1 Class B   (1)
CISPR 22:1985 / EN 55022:1994 Class B   (1)
EN 50082−1:1992
      IEC 1000−4−2: 1995 / EN 61000−4−2:1995 − 4 kV CD, 8 kV AD
      IEC 801−3: 1984 / prEN 55024−3:1991 − 3 V/m
      IEC 1000−4−4: 1995 / EN 61000−4−4:1995 − 4 kV Power Lines
                        2 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, _May 20, 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:+49−7031−14−3143)**

Declaration of Conformity 2

Declaration of Conformity
according to ISO/IEC Guide 22 and EN 45014

Manufacturer: Hewlett-Packard Company
                            100 Domain Drive
                            Exeter, NH   03833
                            USA

Declares , that the:
    Product Name: B-Class Computer Workstation
    Model Numbers: HP9000 / B180L
    Base Product Number: A4323A
    Product Options: all

conforms to the following specifications:

    Safety   IEC 950:1991+A1+A2+A3 / EN 60950:1992+A1+A2+A3
                USA 21CFR Subpart J - for FC Laser module

    EMC   CISPR 11: 1990 / EN 55011: 1991 Class B
                CISPR 22: 1993 / EN 55022: 1994 Class B
                EN 50082-1:1992
                      IEC 1000-4-2: 1995 / EN 61000-4-2: 1995 - 4kV CD, 8 kV AD
                      IEC 801-3: 1984 / EN 55024-3: 1991 - 3 v/m
                      IEC1000-4-4:1995 / EN 61000-4-4:1995 - 2 kV Signal Lines, 4 kV Power Lines
                US FCC Part 15, Level B
                Japan VCCI, Class B

and is certified by:
                British Standards Institute: ISO 9000-2 for Hewlett-Packard, OFG-E, Exeter,NH
                USL Listed to UL1950, 3rd edition, D3 Deviations, File E146385
                CNL Listed to CSA 22.2 No.950
                TUV Certified to EN60950 2nd edition with A1 & A2 & A3
                Australia/New Zealand AS/NZS 3548
                HP Fort Collins CCQD HQE T-Com Report # 97-40ES-002-I

supplementary information:
The product herewith complies with the requirements of the following Directives and carries the CE
marking accordingly:
- the EMC directive 89/336/EEC and 92/31/EEC and 93/68/EEC
- the Low Voltage Directive 73/23/EEC and 93/68/EEC

This product was tested in a typical Hewlett Packard workstation configuration.

Exeter, NH, USA 16ᵗᴴ MAY 1997   Debra Murphy
                Date   Debra Murphy, Site Quality and Engineering Manager

For Compliance Information ONLY, contact:
European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE
                     Standards Europe, Herrenberger Straße 130, D-71034 Böblingen (FAX: +49-7031-14-3143)

Americas Contact: Hewlett-Packard, OFG-E Site Quality Manager, mail stop EXA-02, 100 Domain Drive, Exeter, NH
                     03833, USA (FAX: 603-773-3311)

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Special Video Configuration Statements

The following statements apply only to those applications which include a cable connected to the S-Video connector on the A4248A card. No modification to the regulatory statements is necessary for applications which include cables connected to other connectors on the card but not to the S-Video connector.

For EN55022 or CISPR 22 Applications:

WARNING: **This is a Class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.**

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.

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VCCI Class 2 ITE

　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
目的としていますが、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	Lpa<70dB
operator position	am Arbeitsplatz
normal operation	normaler Betrieb
per ISO 7779	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, installation, and configuration:

- 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 antistatic bags.

- Handle printed circuit boards by their edges, once you have removed them from their protective antistatic bags.

Safety Statement

This equipment conforms to the following safety standards:

- UL 1950
- CSA 950
- IEC 950
- EN 60950

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

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.

Visible LEDs

The visible LED on this product is classified as "**Class 1 LED PRODUCT**" in accordance with **EN 60825-1**.

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 Verietzungen 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 source power 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.

B

Changing Your Workstation's Hardware Configuration

This appendix describes the procedures to change your workstation's hardware configuration. It presents the information in the following sections:

- Checking the SCSI IDs
- Preparing your workstation
- Removing the main tray assembly
- Replacing the main tray assembly
- Installing storage devices
- Installing additional memory
- Installing cache boards
- Installing an EISA, GSC, or PCI option board
- Installing an optional System Graphics RAM (EGRAM) board
- Changing your monitor type

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
- Needlenose pliers
- Torx screwdriver

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

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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:

```
H/W Path    Class                   Description
==============================================
            bc
8           bc                      Pseudo Bus Converter
8/0             unknown             Processor
8/12            ext_bus             GSC Fast/Wide SCSI
Interface
8/12.6              target
8/12.6.0                disk        HP      C3325W
8/12.7              target
8/12.7.0                ctl         Initiator
8/16            ba                  Core I/O Adapter
8/16/0              ext_bus         Built-in Parallel Interface
8/16/1              audio           Built-in Audio
8/16/4              tty             Built-in RS-232C
8/16/5              ext_bus         Built-in SCSI
8/16/5.6                target
8/16/5.6.0              disk        Quantum VP32210
8/16/5.7                target
8/16/5.7.0              ctl         Initiator
8/16/6              lan             Built-in LAN
8/16/7              ps2             Built-in Keyboard/Mouse
8/16/10             pc              Built-in Floppy Drive
8/16/10.2               floppy      HP_PC_FDC_FLOPPY
8/20            ba                  Core I/O Adapter
8/20/2              tty             Built-in RS-232C
8/20/5              ba              EISA Bus Adapter
8/24            graphics            Graphics
62          processor               Processor
63          memory                  Memory
```

4   You can find out the SCSI IDs currently in use by looking under the **H/W Path** heading. For example, the SCSI disk above is listed at address 8/16/5.<u>6</u>.0 which indicates a SCSI address 6.

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

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Preparing Your Workstation

This section describes how to prepare your workstation for changing its configuration. Use the following procedure to prepare your workstation:

1 Shut down your workstation by typing the **shutdown -h** command as root user.

NOTE: When you press the power button, the workstation automatically shuts down the operating system before it powers off the system. However, this is not the recommended method for shutting down your system.

2 When the workstation has completed shutting down, turn off the system unit, turn off the monitor, and any peripheral devices connected to the workstation.

3 Unplug the power cord of the system unit, the monitor, and any peripheral devices from ac wall outlets.

4 Unplug the power cord from the back of the system unit.

5 Remove the floor stand from the system unit (if used), as shown in Figure 20.
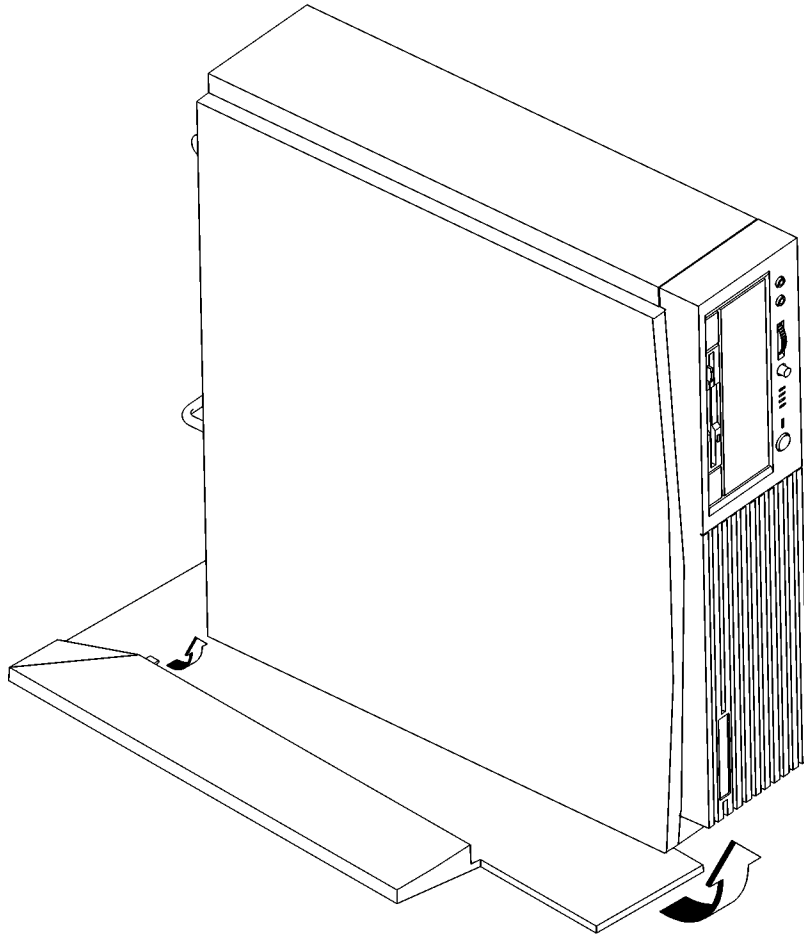
Figure 20   **Removing the Floor Stand**

6 Lay the system unit on a flat surface, such as a table top.

7 Attach a static-grounding wrist strap to bare metal on the back of the system unit.

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Removing the Main Tray Assembly

Perform the following steps to remove the Main Tray Assembly:

1 Shutdown and prepare the workstation as described in *Preparing Your Workstation* earlier in this appendix.

2 Disconnect all cables and connectors from the front and rear connectors of the system unit.

3 Attach a static-grounding wrist strap to bare metal on the back panel of the system unit.

4 Remove the four thumbscrews on the rear of the system unit, as shown in Figure 21.

Thumbscrews

Thumbscrews
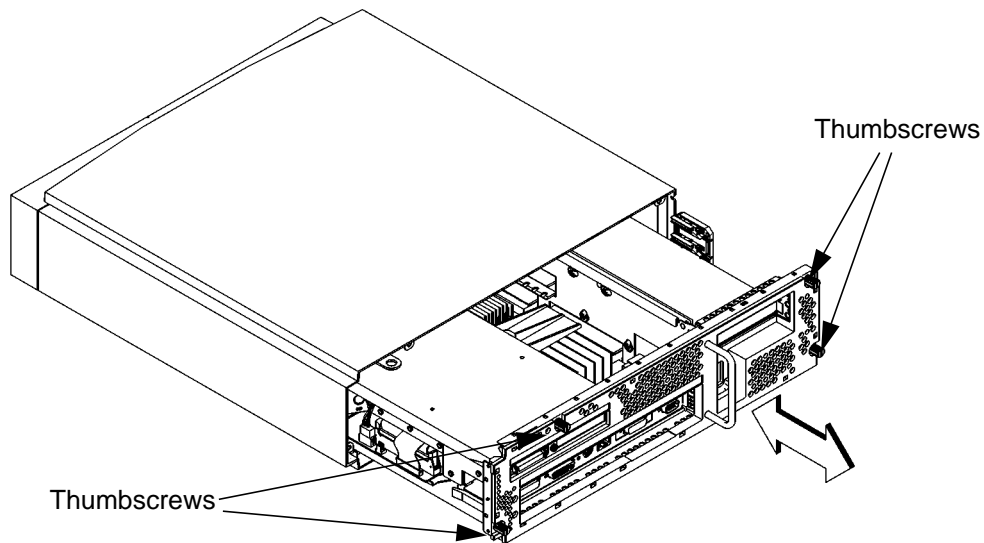
Figure 21 **Removing Main Tray Assembly**

5 Place one hand on the top of the system unit and push, while pulling the handle on the rear panel with your other hand. See Figure 21.

6 Slide the main tray assembly out of the chassis.

Replacing the Main Tray Assembly

Perform the following steps to replace the main tray assembly:

1 Align the main tray assembly with the chassis, aligning the tray with the ridges on the bottom of the case, and slide it into place, as shown in Figure 22.
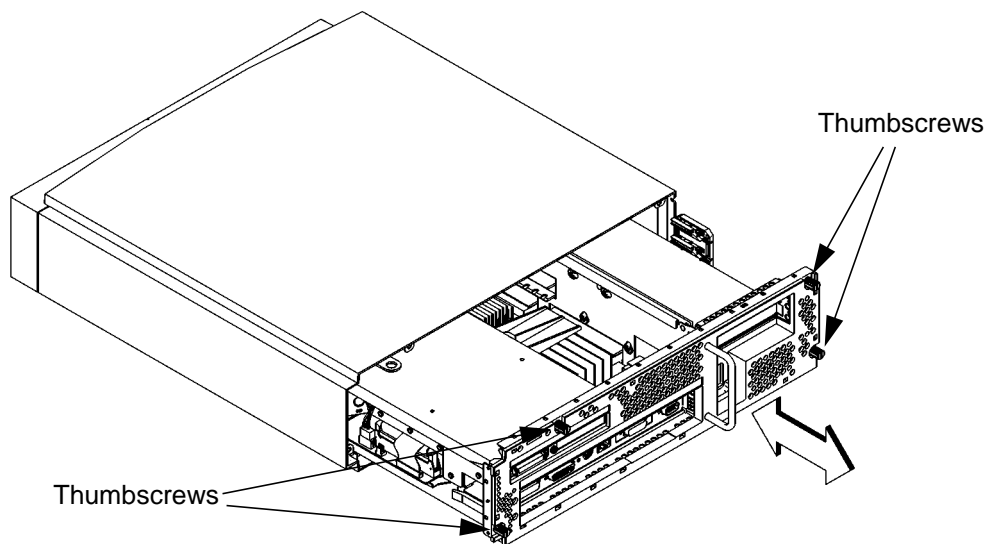
Figure 22   **Replacing the Main Tray Assembly**

2 Slide the main tray in until it is fully seated in the chassis.

3 Tighten the four thumbscrews, as shown in Figure 22.

NOTICE: To maintain regulatory agency compliance, verify that the main tray is fully seated and all four thumb screws are completely tightened.

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4 Reconnect the power cables and any other cables or terminators that you disconnected when opening the workstation.

5 Power on the monitor, any peripheral devices, and the system unit.

If you installed a new hard disk drive, go to Configuring a Hard Disk Drive on page 135.

If you installed a new removable media device, refer to the following chapters for information on using the device:

• Chapter 2 - Using Your CD-ROM Drive

• Chapter 3 - Using Your Digital Data Storage (DDS) Tape Drive

• Chapter 4 - Using Your 3.5-inch Floppy Drive

Installing Storage Devices

This section describes how to install storage devices in your workstation. Before installing a new storage device, perform the following procedures as described earlier in this appendix:

- Checking the SCSI IDs

- Preparing Your Workstation

- Removing the Main Tray Assembly

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

NOTICE: Do not use SCSI ID 7 for any of your storage devices' SCSI addresses. The host SCSI controllers use SCSI ID 7.

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Preparing to Install Your Storage Device

This section describes information that you need to consider and procedures that you need to perform before installing any storage device.

Configuring your Storage Device

Table 15 lists the recommended SCSI IDs for internal storage devices. If an existing device already uses one of the suggested IDs, select an alternate ID.

Table 15   **Default SCSI IDs**

Fast, Wide SCSI and Ultra Wide SCSI	
1st Hard Disk Drive	ID 6
2nd Hard Disk Drive	ID 5
Note: The Fast, Wide SCSI and Ultra Wide controller is set to SCSI ID 7.	
Single-Ended SCSI	
CD-ROM Drive	ID 2
DDS Drive	ID 3
1st Hard Disk Drive	ID 6
2nd Hard Disk Drive	ID 5
Notes: The floppy drive is NOT a SCSI device. Each SCSI controller uses SCSI ID 7.	

NOTICE: The floppy disk drive is not a SCSI device.

Set the jumpers and SCSI IDs according to the installation instructions that came with your device. Narrow Single-Ended SCSI can use addresses in the range 0 through 7, with 7 reserved for the controller. Fast, Wide Differential and Ultra, Wide Single-Ended SCSI can use addresses in the range 0 through 15, with 7 reserved for the controller.

Determining Your Storage Devices Position

Each storage device is restricted as to where in the storage tray it may be installed. Before installing a storage device, use Figure 23 and Table 16 to determine which disk tray position is correct for your device.

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Figure 23 shows the storage device positions in the disk tray. Table 16 lists what devices are supported in the different disk tray positions. The numbers in the table's left column refer to the position numbers in Figure 23.

Front
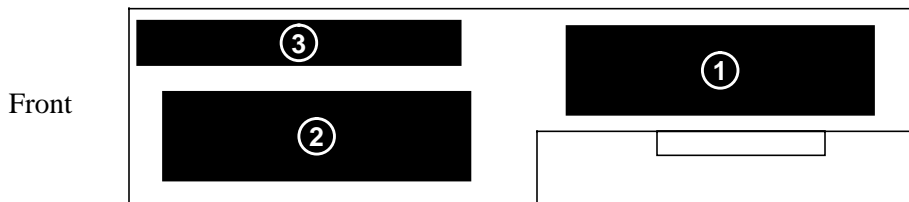
Figure 23   **Disk Tray Positions (Side View)**

Table 16   **Storage Configurations**

Disk Tray Position	Supported Devices	Conditions
3	Floppy Drive	The floppy drive is not a SCSI device.
2	CD-ROM DDS-Tape Single-Ended SCSI Disk Fast Wide SCSI Disk * Ultra Wide SCSI Disk	The CD-ROM drive and the DDS tape drive are single-ended SCSI devices.
1	Single-Ended SCSI Disk Fast Wide SCSI Disk * Ultra Wide SCSI Disk	
* Fast Wide SCSI devices are supported only with the optional Fast Wide SCSI controller.		

Removing the Storage Tray

Before removing the Storage Tray Assembly, perform the procedures described in Preparing to Install Your Storage Device on page 115.

NOTICE:	The Storage Tray Assembly does not have to be removed from the system unit to access a hard disk drive or the 3.5-inch floppy drive.
	If you are installing a hard disk or floppy drive, proceed directly to Removing the Storage Tray Cover on page 120.

Perform the following steps to remove the storage tray assembly from the Main Tray:

1 Pull the tab and slide the memory retainer toward the front of the main tray to remove it, as shown in Figure 24.
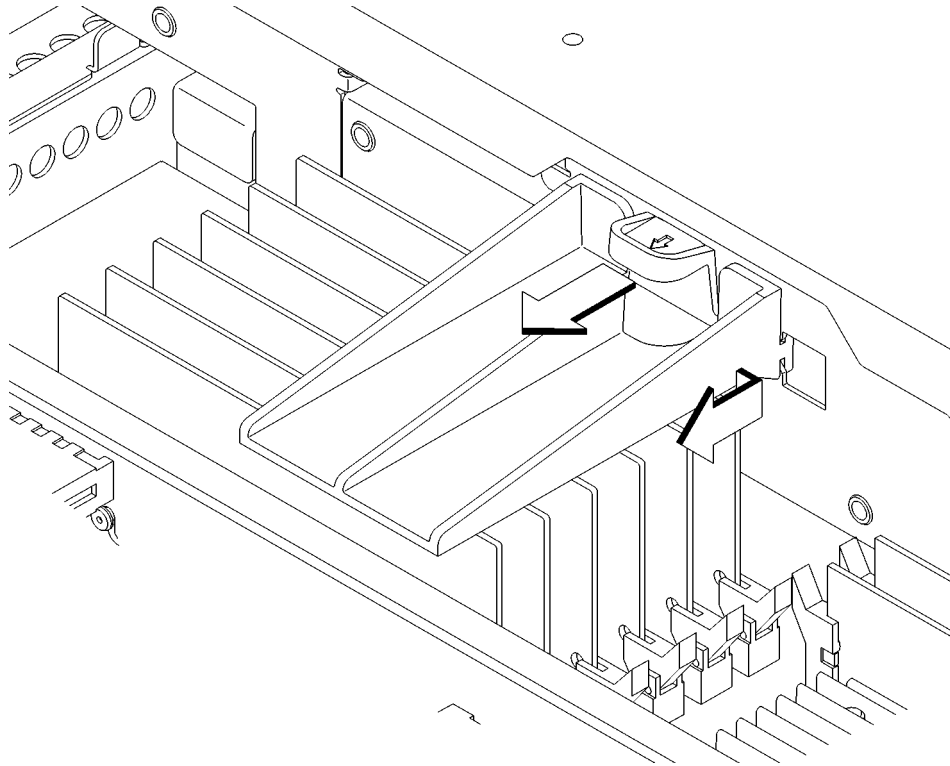
Figure 24   **Removing the Memory Retainer**

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2 Disconnect the power, SCSI and CD Audio cables from the system board and the backplane, as shown in Figure 25.

When disconnecting the floppy cable use the following procedure:

a Lift the locking ring on the connector to the up, or unlocked position.

b While holding the locking ring in the unlocked position, pull the cable out of the connector.

3 Remove SCSI terminators from rear panel SCSI connectors (if necessary).

4 Remove the storage tray retaining screw, as shown in Figure 25.
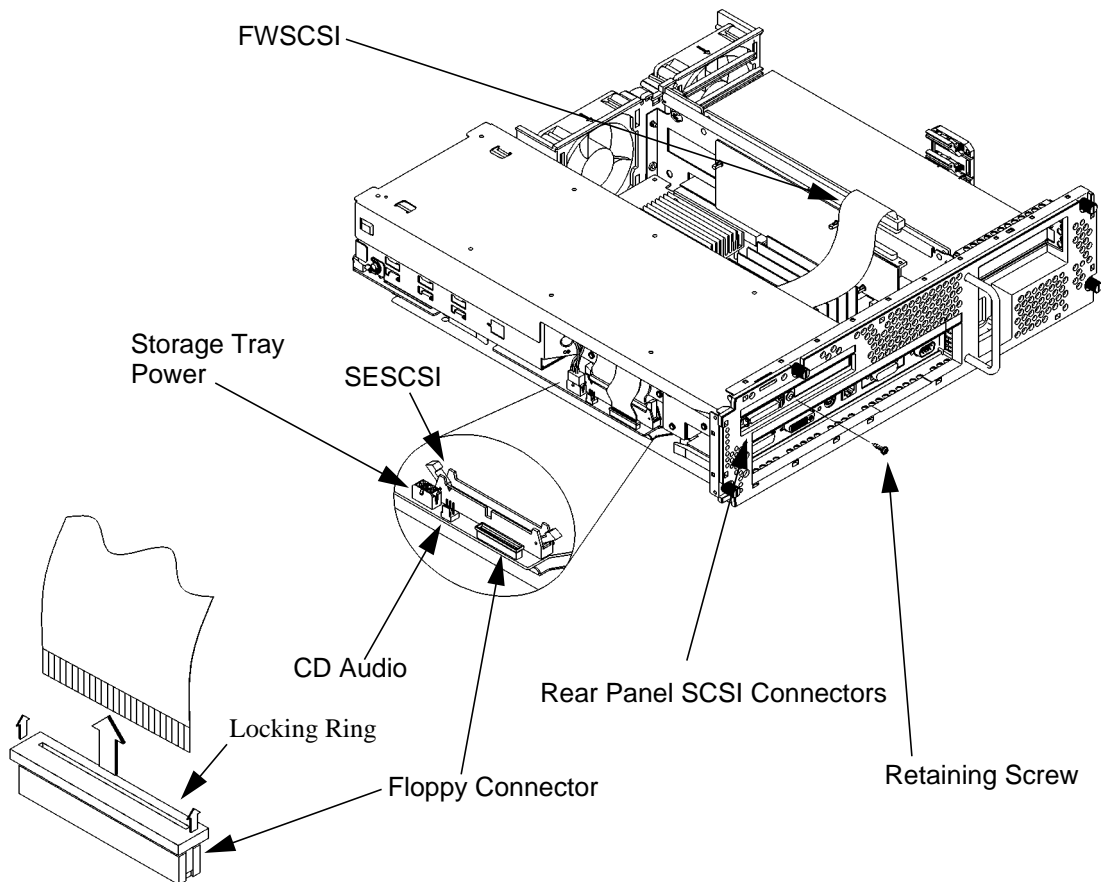
Figure 25   **Disconnecting the Storage Tray Assembly**

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5 Hold the storage tray with both hands and slide it toward the front of the main tray approximately an inch, then lift it straight up to remove it.
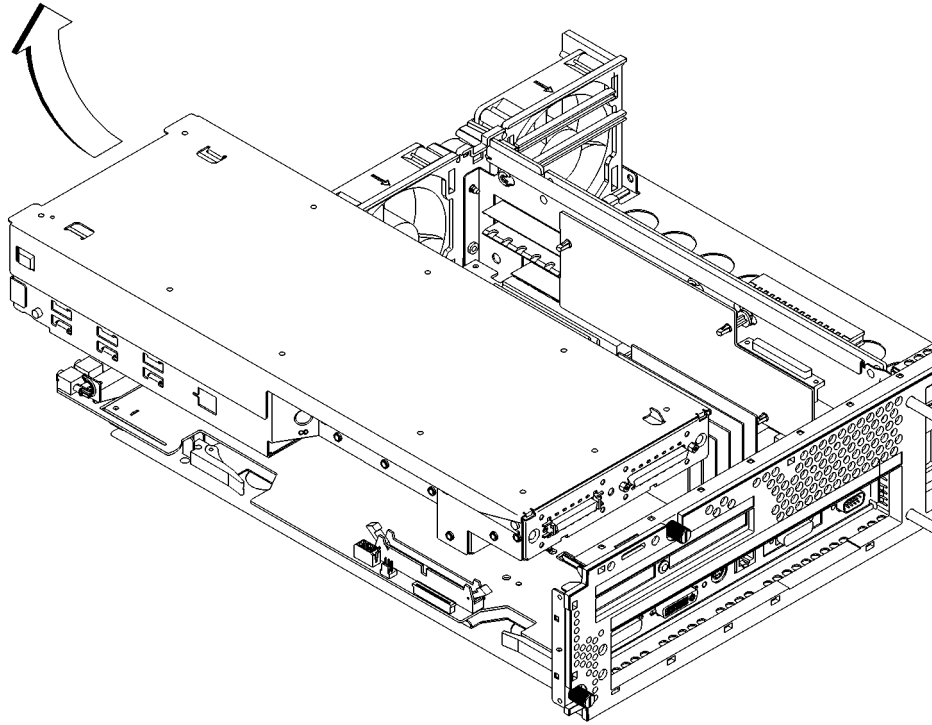
Figure 26   **Removing the Storage Tray Assembly**

Removing the Storage Tray Cover

To remove the storage tray cover press in the two cover locking tabs then lift the front end of the cover and slide it forward off of the pins in the rear, as shown in Figure 27.
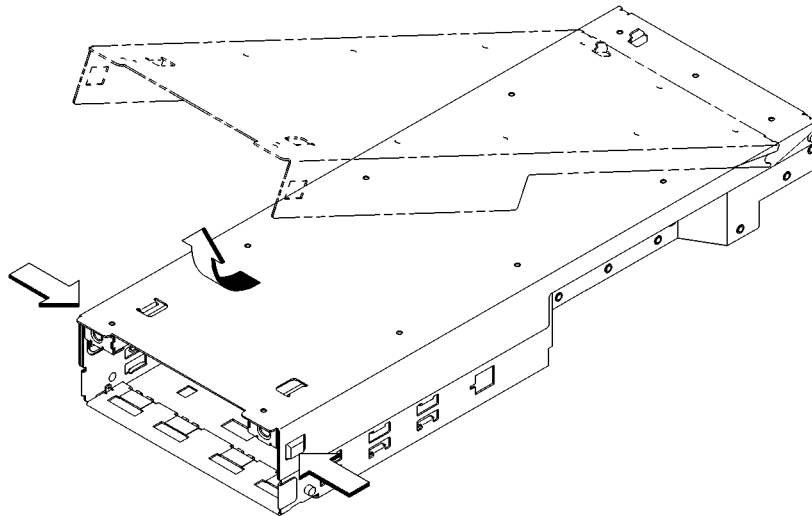
Figure 27   **Removing the Storage Tray Cover**

Proceed to one of the following subsections to install your storage device in the disk tray:

- Installing a CD-ROM or a DDS-Format Tape Drive

- Installing a Floppy Drive

- Installing a Hard Disk Drive in Position 2 (Front Position)

- Installing a Hard Disk Drive in Position 1 (Rear Position)

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Installing a CD-ROM or a DDS-Format Tape Drive

Perform the following procedure to install a CD-ROM or DDS tape drive in
the disk tray:

1 Remove the disk filler panel from the bottom location of the storage tray bezel by
using a coin or other flat, blunt, object to pry it from the front., as shown in
Figure 28.
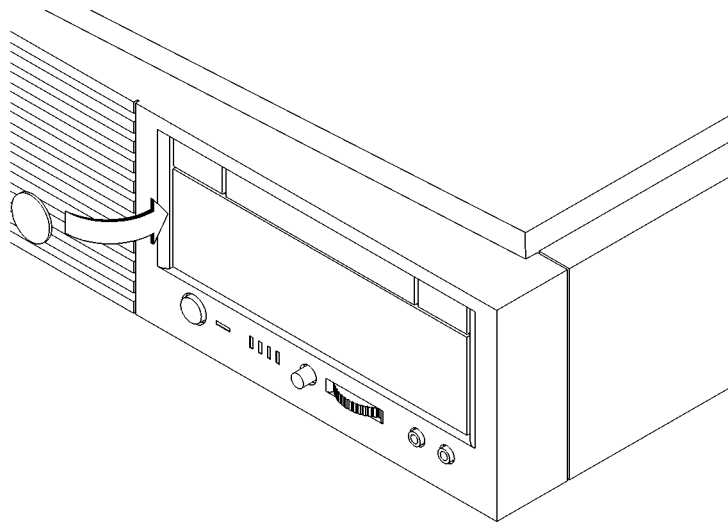
Figure 28   **Removing a Disk Filler Panel**

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2 From the front of the storage tray, line up the slides on the CD-ROM or DDS tape drive with the slots in the storage tray, and slide it into place, as shown in Figure 29.
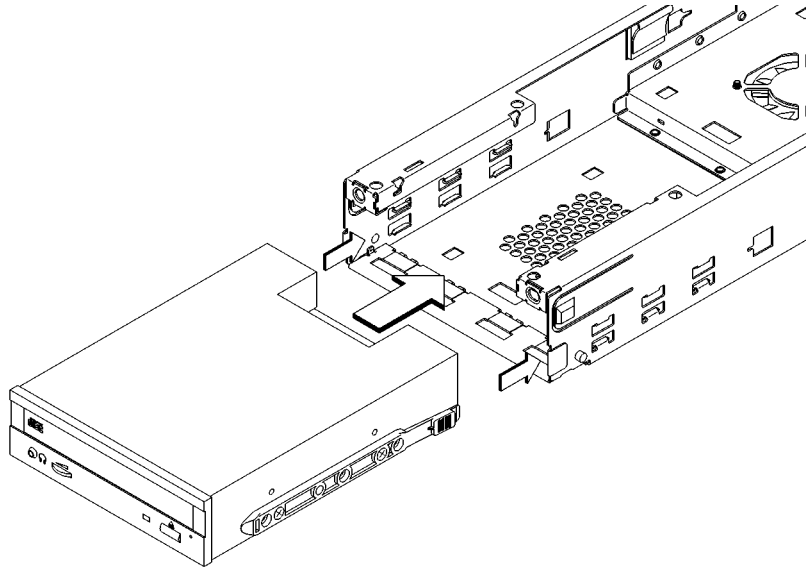
Figure 29   **Installing a CD-ROM or DDS Tape**

3 Push the CD-ROM or tape drive in about half way.

4 Connect the single-ended SCSI data cable and the power cable to the drive.

5 Push the drive in all of the way until you hear and feel the slides snap into place

6 Connect the CD-ROM audio cable to the CD-ROM drive.

7 Feed the CD-ROM audio cable out of the storage tray opening.

8 Proceed to the section entitled Replacing the Storage Tray Cover on page 132.

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Installing a Floppy Drive

Perform the following procedure to install a floppy drive in the disk tray:

1   Remove the floppy filler panel from the top location of the bezel by using a coin or other flat, blunt, object to pry it from the front, as shown in Figure 30.
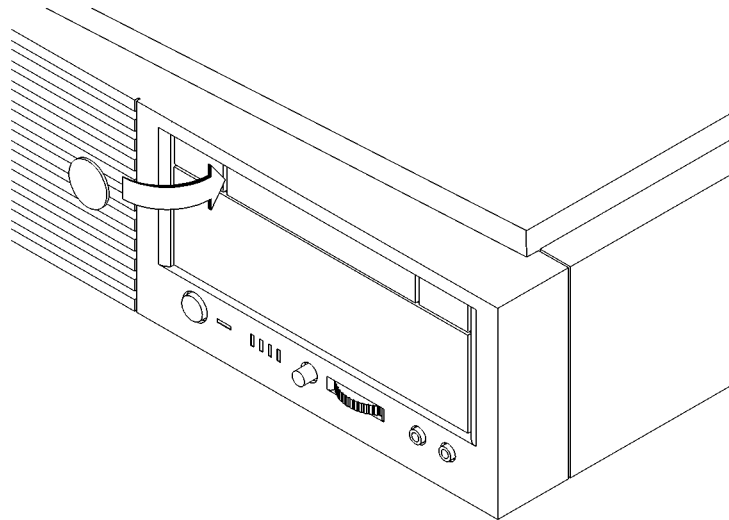
Figure 30   **Removing the Floppy Filler Panel**

2 Set the floppy drive in the floppy support tray. Be sure to line up the alignment pin in the tray with the hole in the floppy drive, as shown in Figure 31.
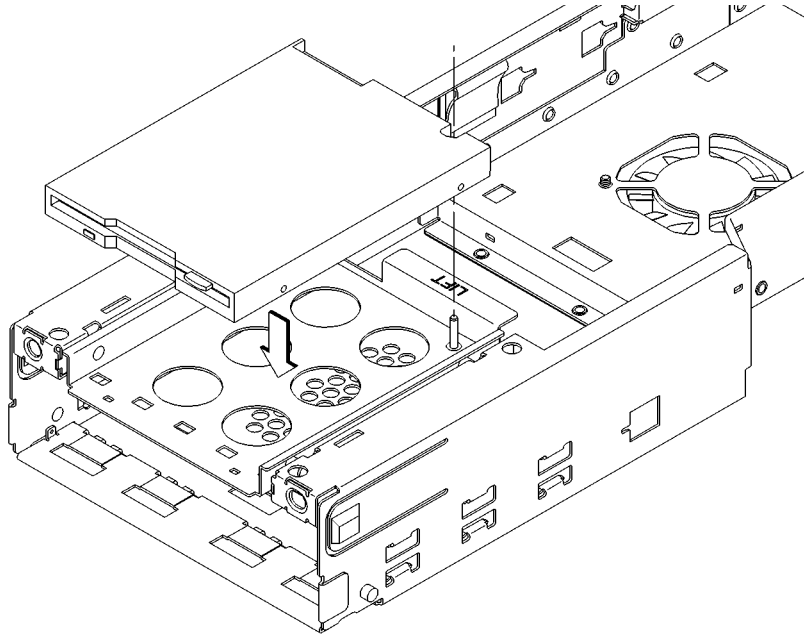
Figure 31 **Installing the Floppy Disk Drive**

3 Connect the floppy data cable to the floppy drive and the system board as shown in, Figure 32.

When connecting the floppy data cable, use the following procedure, as shown in Figure 32:

a Lift the locking ring on the connector to the up, or unlocked position.

b While holding the locking ring in the unlocked position, insert the cable into the connector.

c Press down on the locking ring evenly on both ends until it snaps into the down, or locked, position.
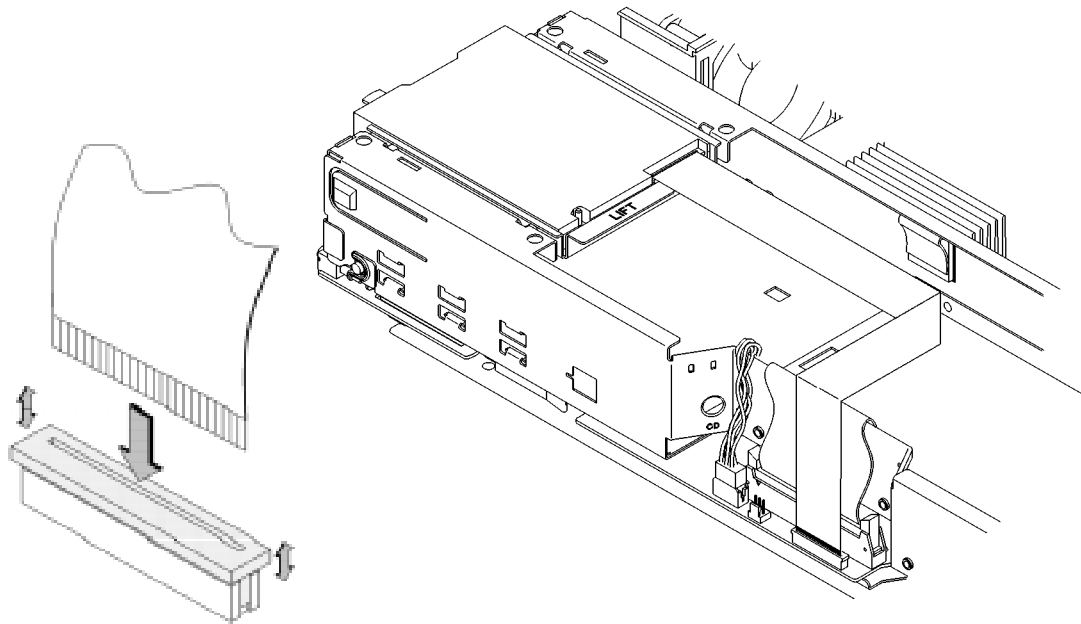
Figure 32   **Connecting the Floppy Drive Data Cable**

4 Proceed to the section entitled Replacing the Storage Tray Cover on page 132.

Installing a Hard Disk Drive in Position 2 (Front Position)

Perform the following procedure to install a hard disk drive:

1   Disconnect the cable from the floppy disk drive, as shown in
    Figure 33.

    a   Lift the locking ring on the connector to the up, or unlocked position.

    b   While holding the locking ring in the unlocked position, pull the cable out of
    the connector.
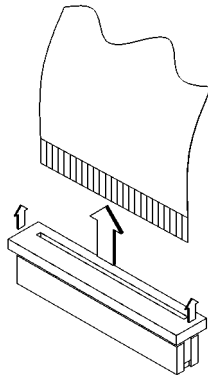
Figure 33   **Disconnecting the Floppy Drive Cable**

2   Lift the rear of the floppy disk carrier, push the carrier toward the rear of the disk tray, then lift the front of the floppy disk carrier from the Storage Tray, as shown in Figure 34.
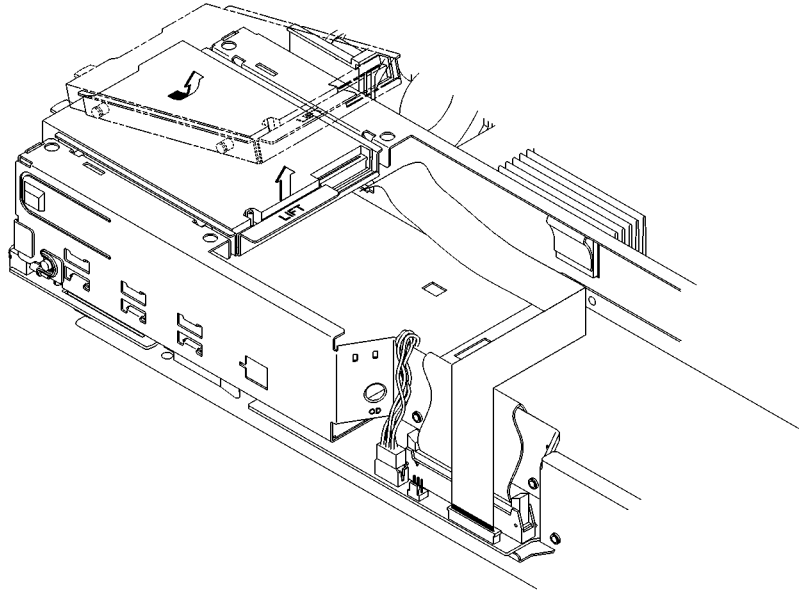
Figure 34   **Removing the Floppy Disk Drive Assembly**

3 Align the four feet on the bottom of the disk drive carrier with the square holes in the storage tray, as shown in Figure 35.
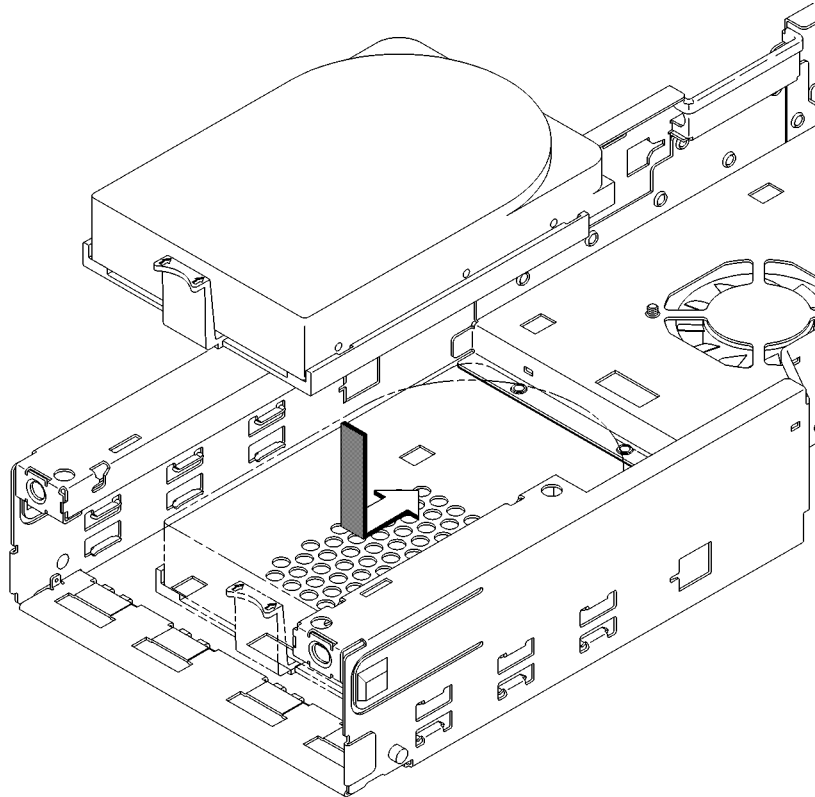
Figure 35   **Installing a Hard Disk Drive in Position 2 (Front Position)**

4 Set the drive in the storage tray.

5 Connect the power connector and the appropriate SCSI connector to the drive.

6 Push the drive toward the rear of the tray until the locking tab on the drive carrier snaps into place, as shown in Figure 35.

7 Replace the floppy and its carrier by setting the mounting pins near the front of the storage tray in place first, then push the carrier toward the front of the storage tray slightly and set the rear mounting pins in place.
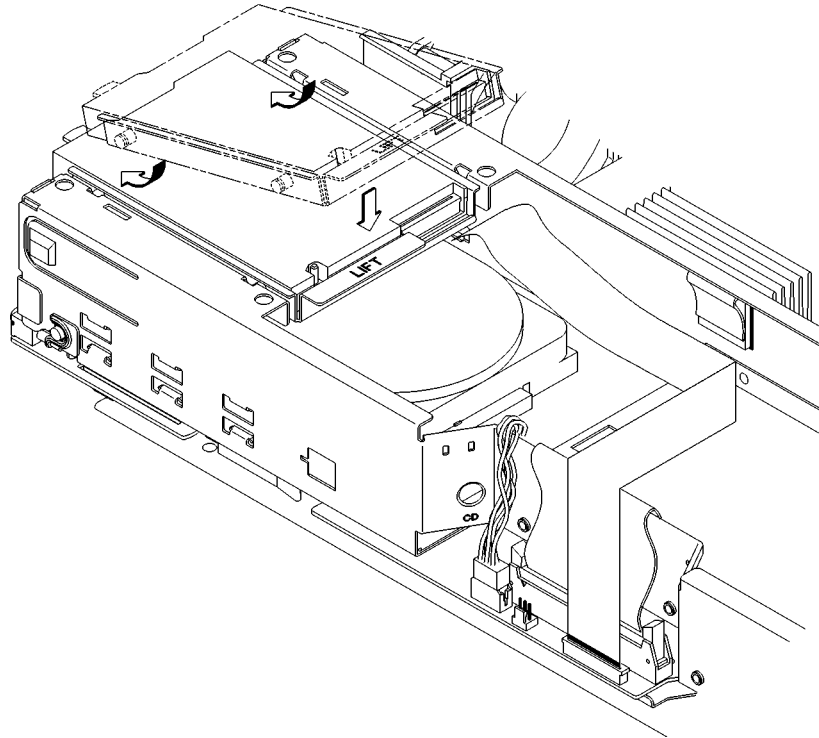
Figure 36   **Replacing the Floppy Drive and Carrier**

8 Push down firmly on the rear of the floppy carrier to ensure that it is fully locked in place.

9 Connect the cable to the floppy drive.

When connecting the floppy data cable, use the following procedure, as shown in Figure 37:

a Lift the locking ring on the connector to the up, or unlocked, position.

b While holding the locking ring in the unlocked position, insert the cable into the connector until the blue line is even with the locking ring.

c Press down on the locking ring evenly on both ends until it snaps into the down, or locked, position.
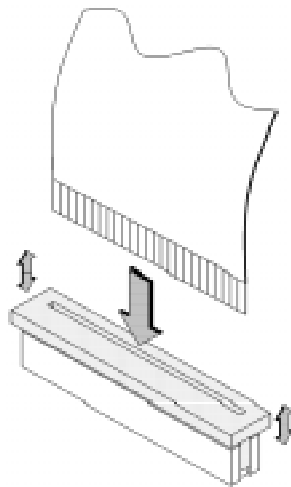
Figure 37   **Connecting the Floppy Drive Data Cable**

10 Proceed to the section entitled Replacing the Storage Tray Cover on page 132.

Installing a Hard Disk Drive in Position 1 (Rear Position)

Perform the following procedure to install a hard disk drive in position 1:

1 Align the four feet on the bottom of the drive carrier with the square holes in the storage tray, as shown in Figure 38.
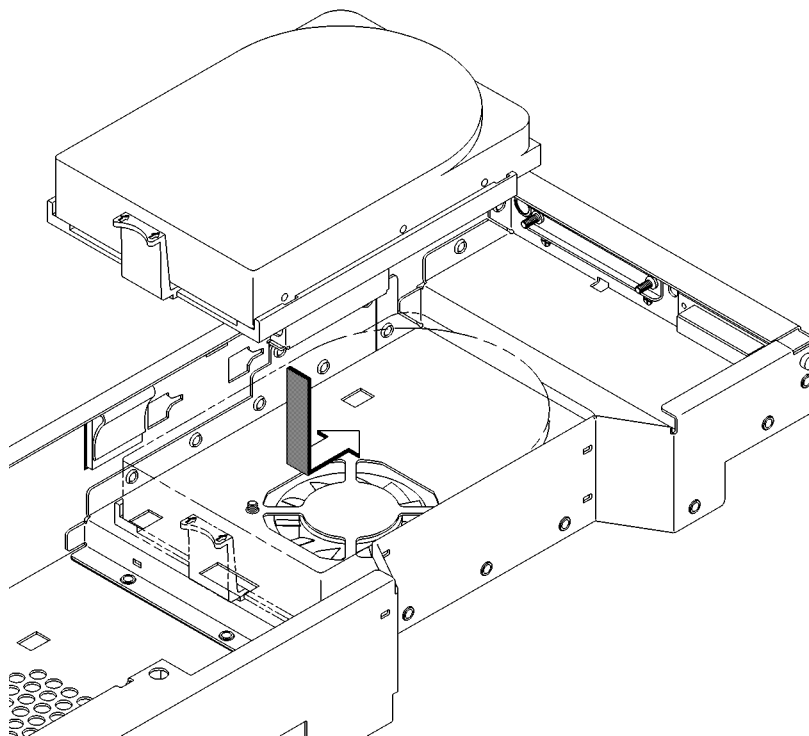
Figure 38   **Installing a Hard Disk Drive in Position 1 (Rear Position)**

2 Set the drive in the storage tray.

3 Connect the power connector and the appropriate SCSI connector to the drive.

4 Push the drive toward the rear of the tray until the locking tab on the drive carrier snaps into place, as shown in Figure 38.

5 Proceed to the section entitled Replacing the Storage Tray Cover on page 132.

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Replacing the Storage Tray Cover

Perform the following procedure to replace the storage tray cover, as shown in Figure 39:

1 Slide the cutouts on the rear of the cover onto the pins on the storage tray.

2 Swing the cover into place.

3 Press down on the front edge of the cover to make sure that the locking tabs on the storage tray fully engage the cover.
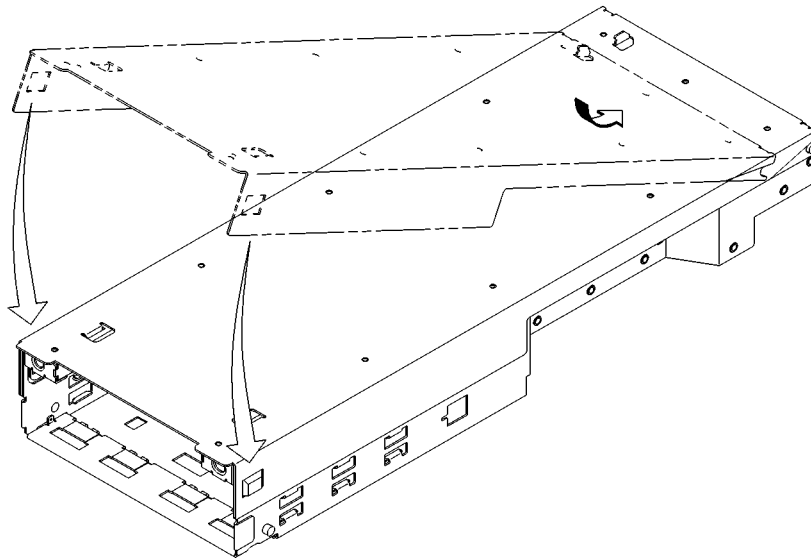
Figure 39 **Replacing the Storage Tray Cover**

4 If you removed the storage tray, continue with the next section Replacing the Storage Tray on page 133.

If you did not remove the storage tray, follow the instructions in Replacing the Main Tray Assembly on page 112.

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Replacing the Storage Tray

When replacing the storage tray, use the following procedure:

1 Align the pins on the back panel of the main tray with the holes on the rear of the storage tray and slide the storage tray onto the pins, as shown in Figure 40.

Retaining Screw
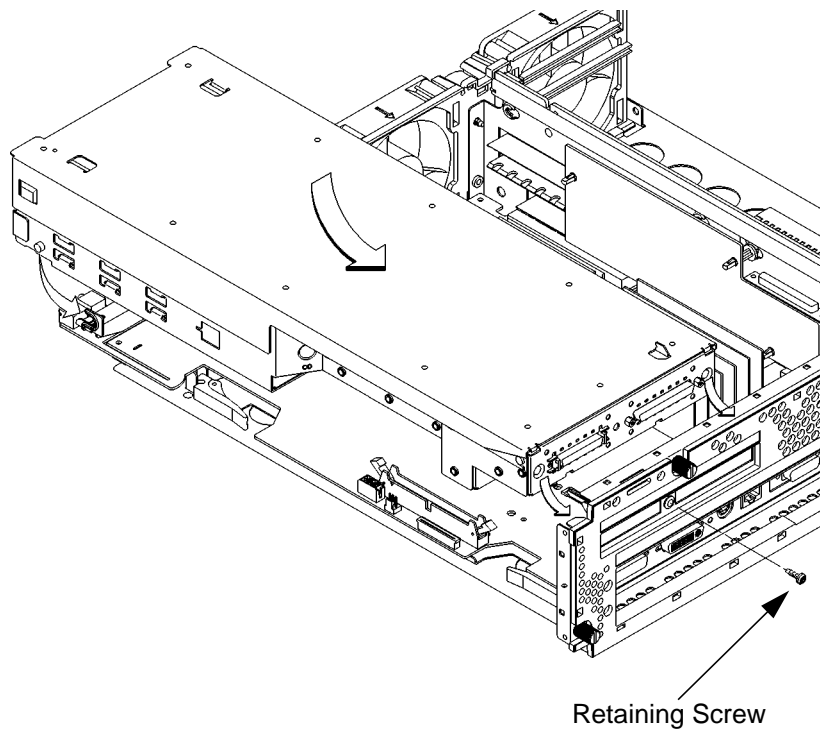
Figure 40   **Installing the Storage Tray Assembly**

2 Lower the front of the storage and move it slightly forward to align the pins on its side with the slots on the main tray, as shown in Figure 40.

3 Slide the storage tray towards the rear of the main tray until the pins are fully seated in the main tray slots, as shown in Figure 40.

4 Replace and tighten the storage tray retaining screw, as shown in Figure 40.

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5 Reconnect the floppy, SE SCSI, power, CD-ROM audio, and FW SCSI cables as shown in Figure 41. Reconnect rear-panel SCSI connector terminators, if necessary.

When connecting the floppy cable to the system board, use the following procedure:

a Lift the locking ring on the connector to the up, or unlocked, position.

b While holding the locking ring in the unlocked position, insert the cable into the connector until the blue line is even with the locking ring.

c Press down on the locking ring evenly on both ends until it snaps into the down, or locked, position.
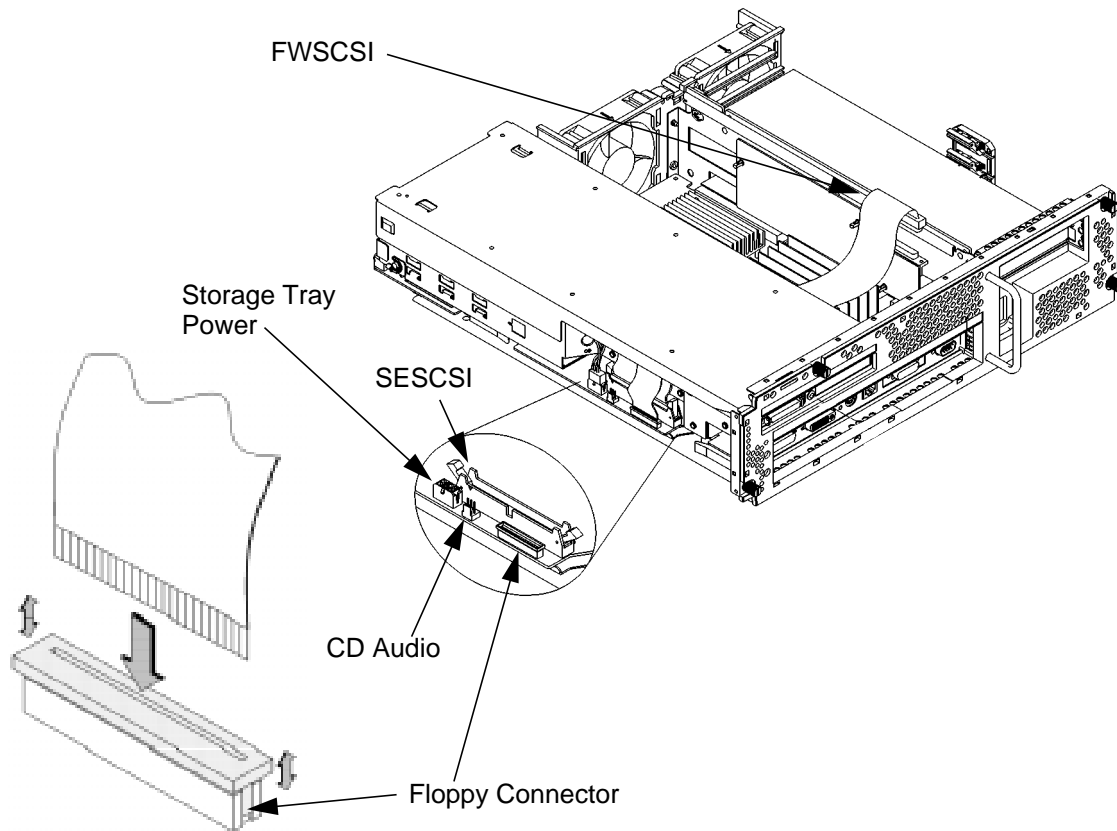
Figure 41 **Connecting the Storage Tray Cables**

Configuring a Hard Disk Drive

This section describes how to add a hard disk drive to your system as a file system using SAM. If you installed a new hard disk drive, follow these instructions to make your new disk usable as a file system. For more information about configuring a hard disk drive, refer to the *System Administration Tasks* manual.

This procedure requires you to log in as **root**. If you cannot log in as **root**, contact your system administrator.

1 In a terminal window, enter the following at the prompt:

> **/usr/sbin/sam**

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

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

4 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.

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

6 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.

7 Click on **OK**.

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8   The Set Disk Usage and Options window opens. Select File System and click on
        OK.

9   The following screen messages appear:

```
Task started.
Creating the device file...
Modifying "/etc/checklist"...
Task completed.
```

   Click on **OK**.

Installing Additional memory

Before installing memory modules, perform the procedure described in Removing the Main Tray Assembly on page 111.

When you have completed changing your workstation's memory configuration perform the procedure described in Replacing the Main Tray Assembly on page 112.

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

- Before you attempt to install additional memory modules in your B132L/ B132L+/B160L/B180L workstation, use the information described in Appendix D, "Boot Console Interface," to determine the current memory configuration for this workstation.

- Read over the steps involved in installing memory modules before you begin.

- You must insert memory modules in pairs of equal size.

- Modules should be inserted in the lowest numbered memory pair first then in numerical order. For example, install memory in 0A and 0B first, then 1A and 1B, and 2A and 2B. You must also install the largest memory modules first. For example, install 64 Mbyte module pairs, then 32 Mbyte module pairs, then 16 Mbyte module pairs, and so on. Note that the B180L supports the use of 128 Mbyte modules. Refer to Figure 42 for memory pair numbering and location.

- When you have finished installing additional memory modules, use the Boot Console Interface to verify that they are seen by the workstation.

You may need to remove existing memory modules and move them to a different location when changing your workstation's memory configuration. Use the following procedure to remove memory modules. Use the procedure in the subsection entitled Installing Memory Modules on page 141 to install memory modules.

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Removing Memory Modules

Perform the following steps to remove memory modules:

1   Locate the memory modules on the CPU board, as shown in Figure 42.
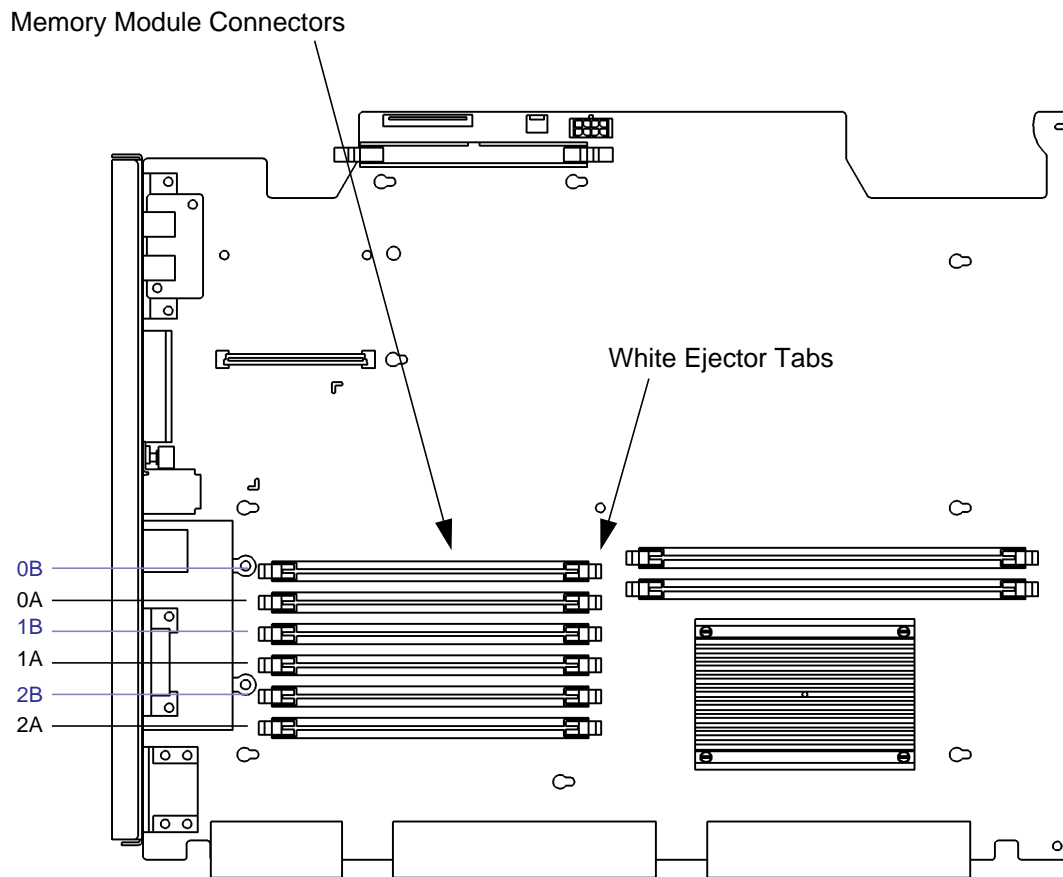
Figure 42   **Memory Module Location**

2 Pull the tab on the memory retainer and slide it toward the front of the main tray to remove it, as shown in Figure 43

Figure 43   **Removing the Memory Retainer**

3 To remove a memory module, push the ejector tabs on each side of the module. Lift the memory module up and out of the connector and place it on a static-free surface. Figure 44 shows how to remove a memory module.
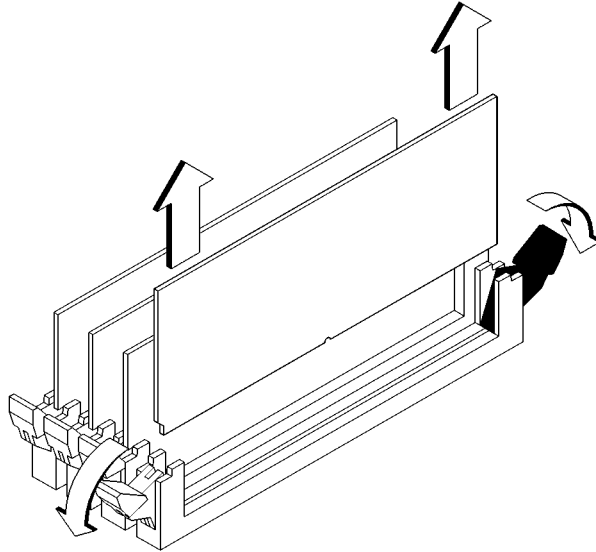
Figure 44 **Removing a Memory Module**

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Installing Memory Modules

Perform the following steps to install memory modules:

1 Locate the memory connectors on the CPU board, as shown in Figure 45.
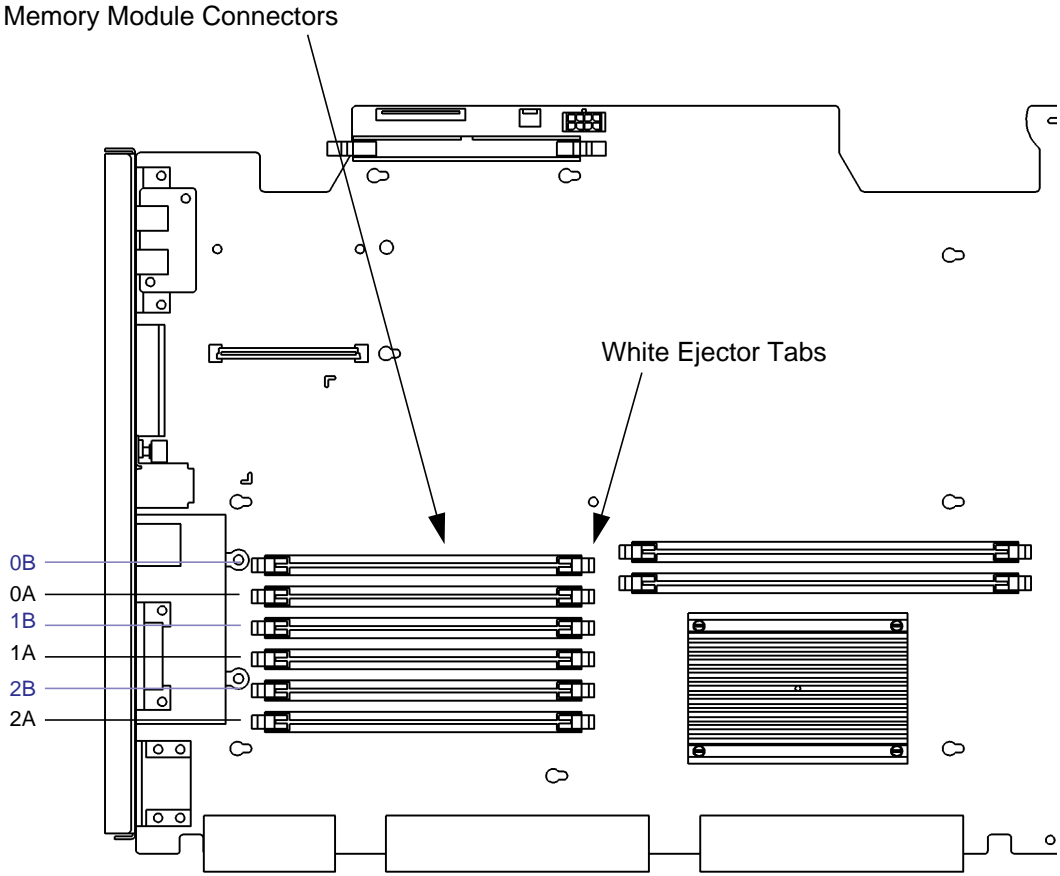
Memory Module Connectors

White Ejector Tabs

0B
0A
1B
1A
2B
2A

Figure 45 **Memory Module Location**

2   Pull the tab on the memory retainer and slide it toward the front of the main tray to remove it, as shown in Figure 46.
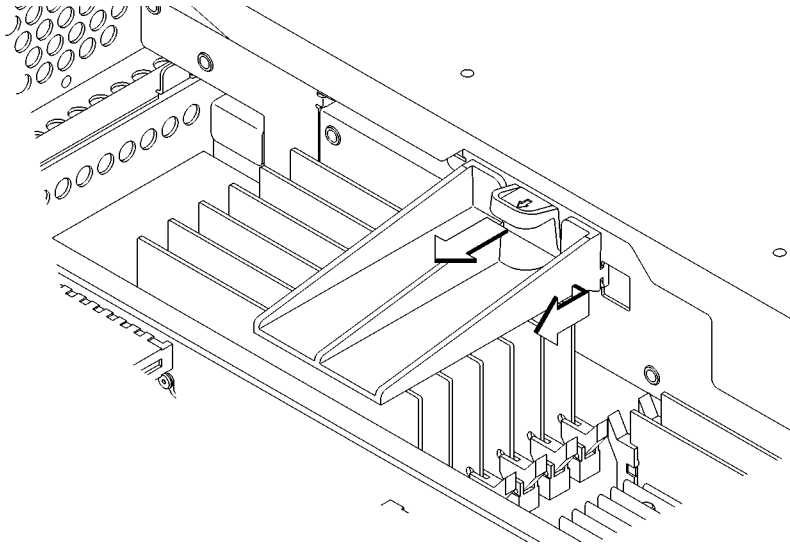
Figure 46   **Removing the Memory Retainer**

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3 Close the ejector tabs on each side of the memory connector to lessen the force required to seat the memory module, as shown in Figure 47.

4 Line up the memory module with the guides making sure that the notched end of the memory module is toward the white ejector tab (front of the main tray), as shown in Figure 47.

White Ejector Tab
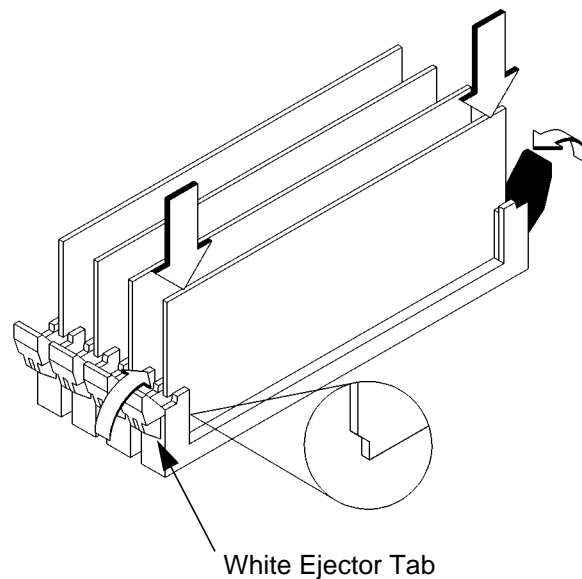
Figure 47 **Installing Memory Modules**

5 Press firmly and evenly on the memory module to ensure that it is fully seated.

6 Install the memory retainer.

7 To verify that this installation was successful, follow the steps in Appendix D, "The Boot Console Interface," on displaying memory information. If you have only replaced a faulty memory module, 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) >."

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Removing Cache Boards

Follow these steps to remove the cache boards from the workstation.

1 Locate the cache boards on the CPU board, as shown in Figure 48.

Cache Board Connectors
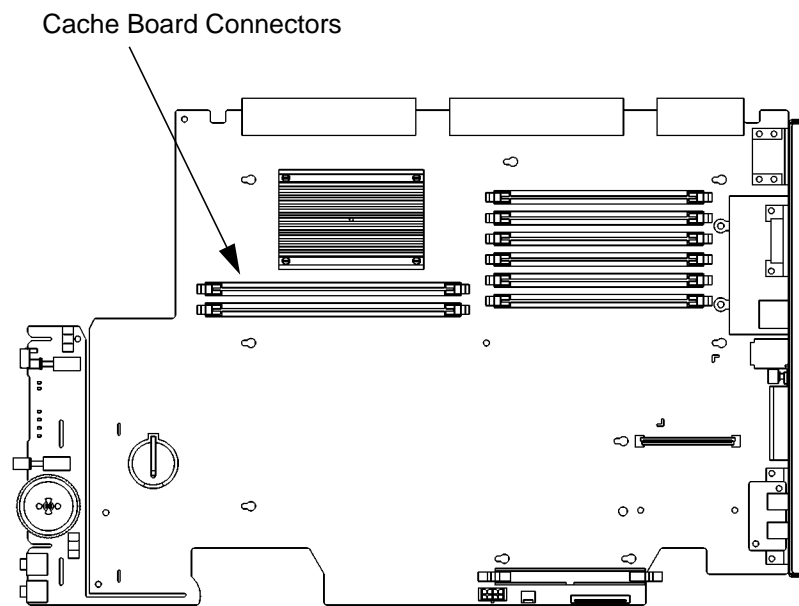
Figure 48   **Cache Boards Location**

2 To remove a cache board, push the ejector tabs on each side of the board. Lift the cache board up and out of the connector and place it on a static free surface.

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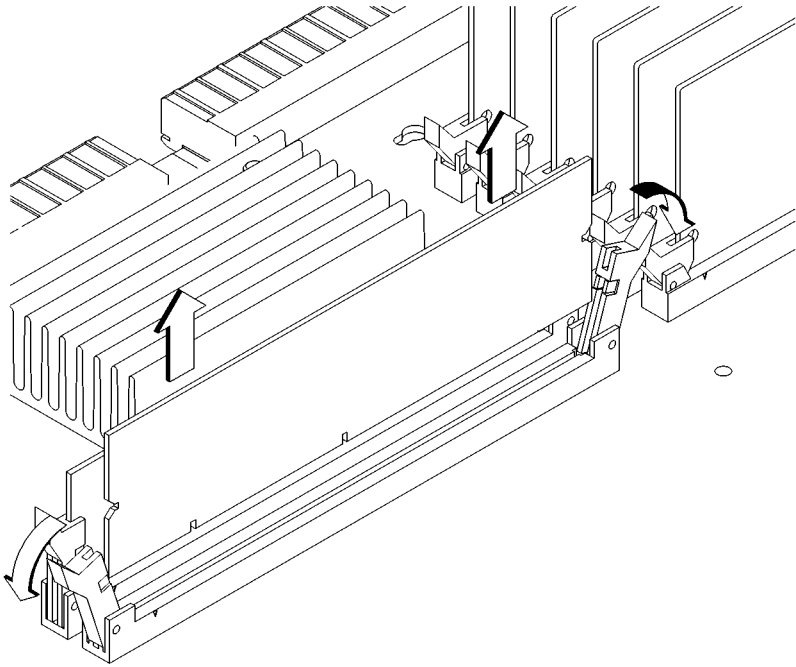
Figure 49   **Removing a Cache Board**

Installing Second Level Cache Boards

Before installing second level cache boards, perform the procedure in Removing the Main Tray Assembly on page 111.

Follow these steps to install second level cache boards into your workstation.

1   Locate the cache board connectors on the CPU board, as shown in Figure 50.

Cache Board Connectors
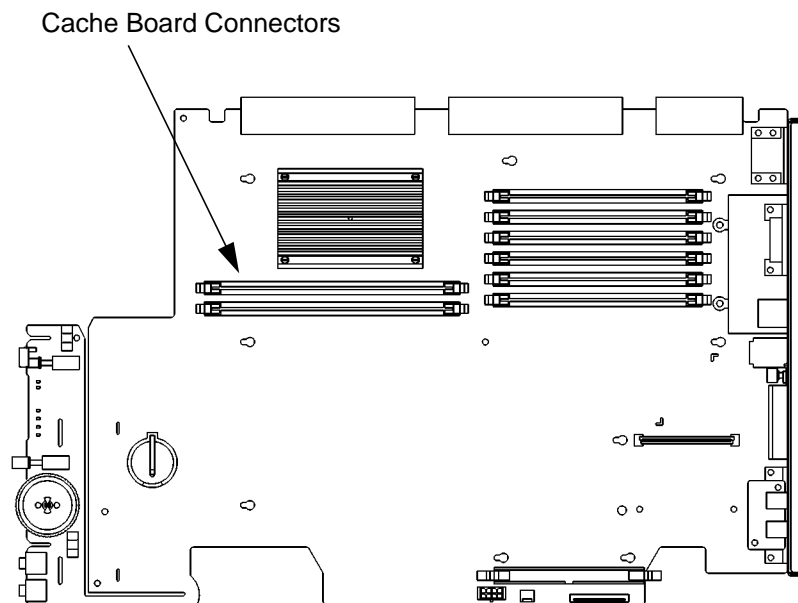
Figure 50   Cache Boards Location

2   Open the ejector tabs on each side of the cache connector and line the cache board up with the guides making sure that the keying notches along the connector edge of the board are away from the memory modules, as shown in Figure 51.

Keying Notches
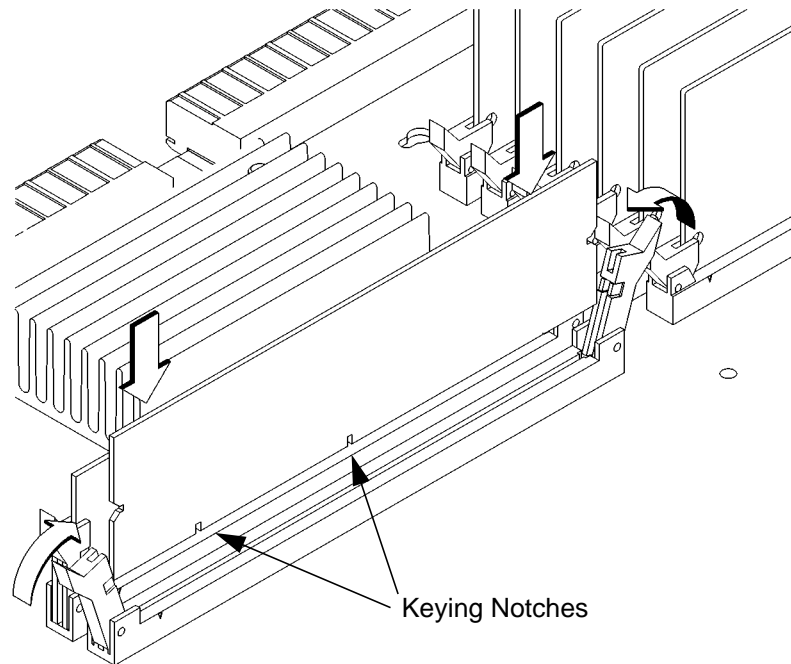
Figure 51   **Installing Cache Boards**

NOTICE: You must install cache boards in pairs of equal size.

3   Press firmly and evenly on the cache board to ensure that it is fully seated. The ejector tabs will close and engage the notches on the sides of the cache board as you push down.

4   Perform the procedure in Replacing the Main Tray Assembly on page 112.

Installing a PCI, EISA, or GSC Option Board

Your workstation includes two option slots. Option slot 1 supports either PCI or GSC option boards. Option slot 2 supports either PCI, EISA, or GSC option boards.

Figure 52 shows the physical layout of the option slots.
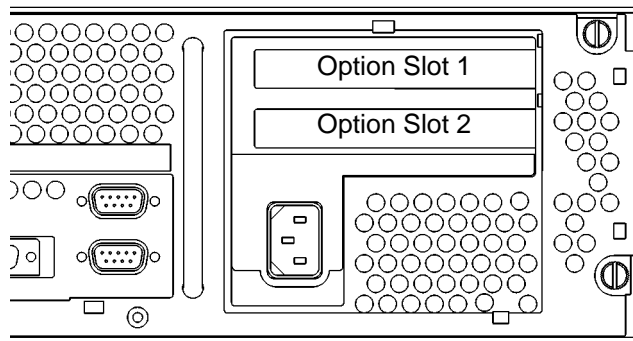
Figure 52   **Option Slots from Outside the System Unit**

Graphics Adapter Considerations

If you are installing a graphics option, read the information in this section first.

Special Video Configuration Statements

The following statements apply only to those applications which include a cable connected to the S-Video connector on the A4248A card. No modification to the regulatory statements is necessary for applications which include cables connected to other connectors on the card but not to the S-Video connector.

For EN55022 or CISPR 22 Applications:

WARNING: **This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.**

For FCC Applications:

NOTICE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Graphics Paths

graphics(0) is the built-in 8-plane graphics adapter.

graphics(1) and *graphics(2)* are graphics adapters installed in option slots 1 and 2.

When a dual display graphics adapter (an adapter which has two video output connectors) is installed, the video connector on the left (when looking at the system from the rear) is *graphics(NA)* and the video connector on the right is *graphics(NB)*, where *N* is the slot number in which the graphics adapter is installed. *A* and *B* denote the two video output connectors on the dual display adapter.

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

Graphics Configuration Restrictions

The system supports only four graphics displays at a time. A "display" is a video output port or connector. For example, the Dual Visualize Enhanced Graphics Card (A4451A) is a dual display card. It has two external video connectors so it accounts for two of the maximum of four displays. Installing two of these cards accounts for four displays, which is the maximum supported by the system.

The built-in graphics adapter accounts for one graphics display (*graphics(0)*). If four displays are installed in the option slots, the built-in graphics adapter is automatically disabled.

NOTICE:	The A4077A Color Graphics Card, A4078A Dual Color Graphics Card, A4079B HCRX-8Z graphics adapter, and the A4071B HCRX-24 graphics adapter with the A4072A Z Accelerator attached are **not supported** in the B Class workstations.

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Installing the Option Board

Before installing option boards you must perform the procedure described in Removing the Main Tray Assembly on page 111.

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

1 Push in the locking tab and slide the option board support bracket toward the rear of the main tray to remove it, as shown in Figure 53.

2 Remove the blank plate retaining screw, then remove the blank plate, as shown in Figure 53.

Blank Plate
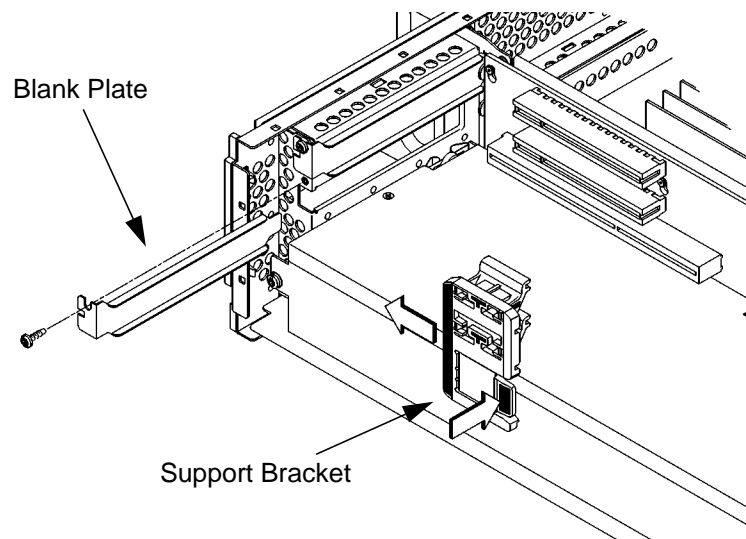
Support Bracket

Figure 53   **Removing the Option Board Support Bracket and Blank Plate**

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3 Slide the board into the slot, as shown in Figure 54.

4 Press in firmly on both ends of the option board at the same time to make sure that it is firmly seated in the backplane connector.

5 Use the blank plate retaining screw to secure the option board, as shown in Figure 54.
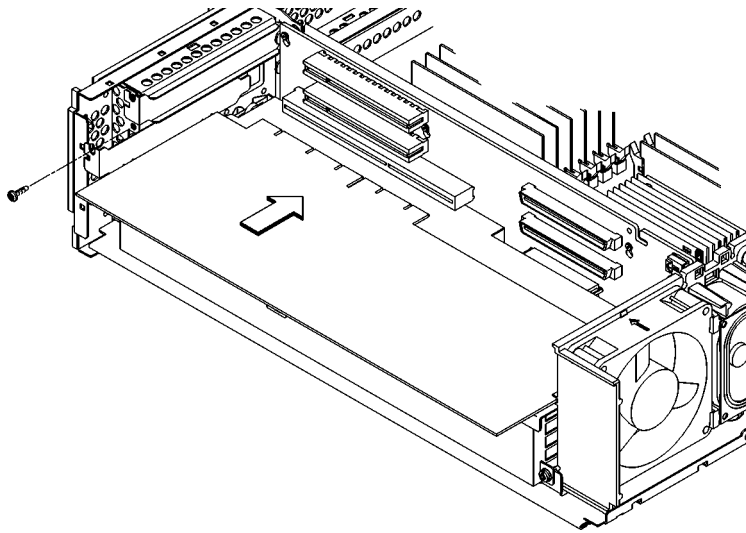
Figure 54   **Installing a PCI, EISA, or GSC Option Board**

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6 If you are installing an EISA or GSC option board, you must use a ballpoint pen tip, or other blunt instrument, to remove the PCI adapter from the correct slot position on the option board support bracket, as shown in Figure 55.
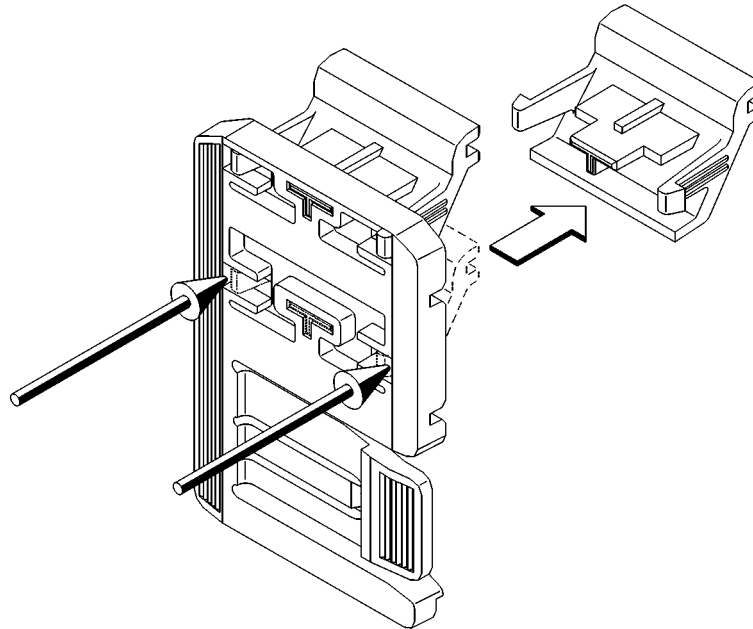
Figure 55 **Removing the PCI Adapter**

7   Place the option board support bracket over the edge of the option board and slide it into the slot on the power supply until the locking tab snaps into place, as shown in Figure 56.
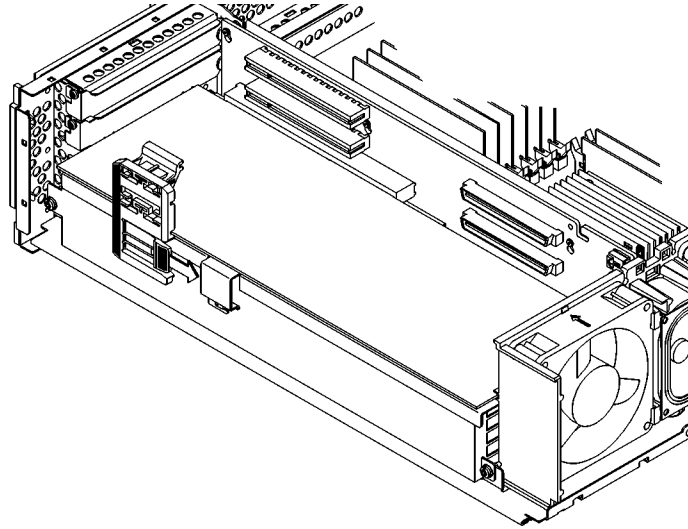
Figure 56   **Replacing the Option Board Support Bracket**

8   Replace the main tray assembly as described in Replacing the Main Tray Assembly on page 112.

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Replacing the Battery

1 Remove the main tray as described in Removing the Main Tray Assembly on page 111.

2 Pull the tab on the memory retainer and slide it toward the front of the main tray to remove it, as shown in Figure 57
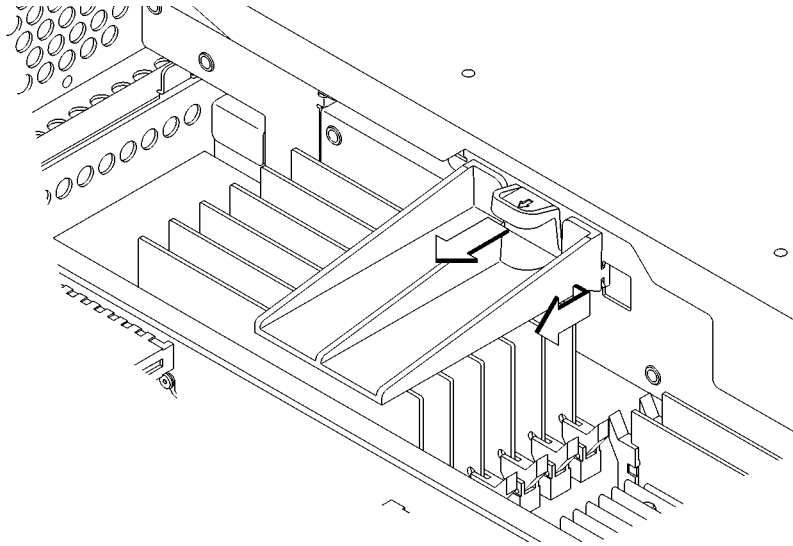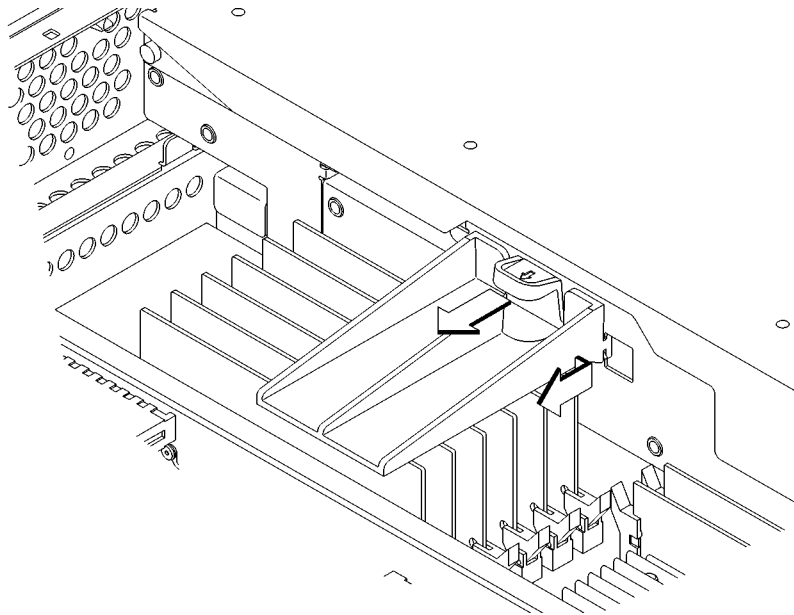

Figure 57   **Removing the Memory Retainer**

3 Disconnect the cables from the system board and the optional fast, wide SCSI adapter, as shown in Figure 58.

When disconnecting the floppy cable use the following procedure:

a Lift the locking ring on the connector to the up, or unlocked position.

b While holding the locking ring in the unlocked position, pull the cable out of the connector.

4 Remove the storage tray retaining screw, as shown in Figure 58.
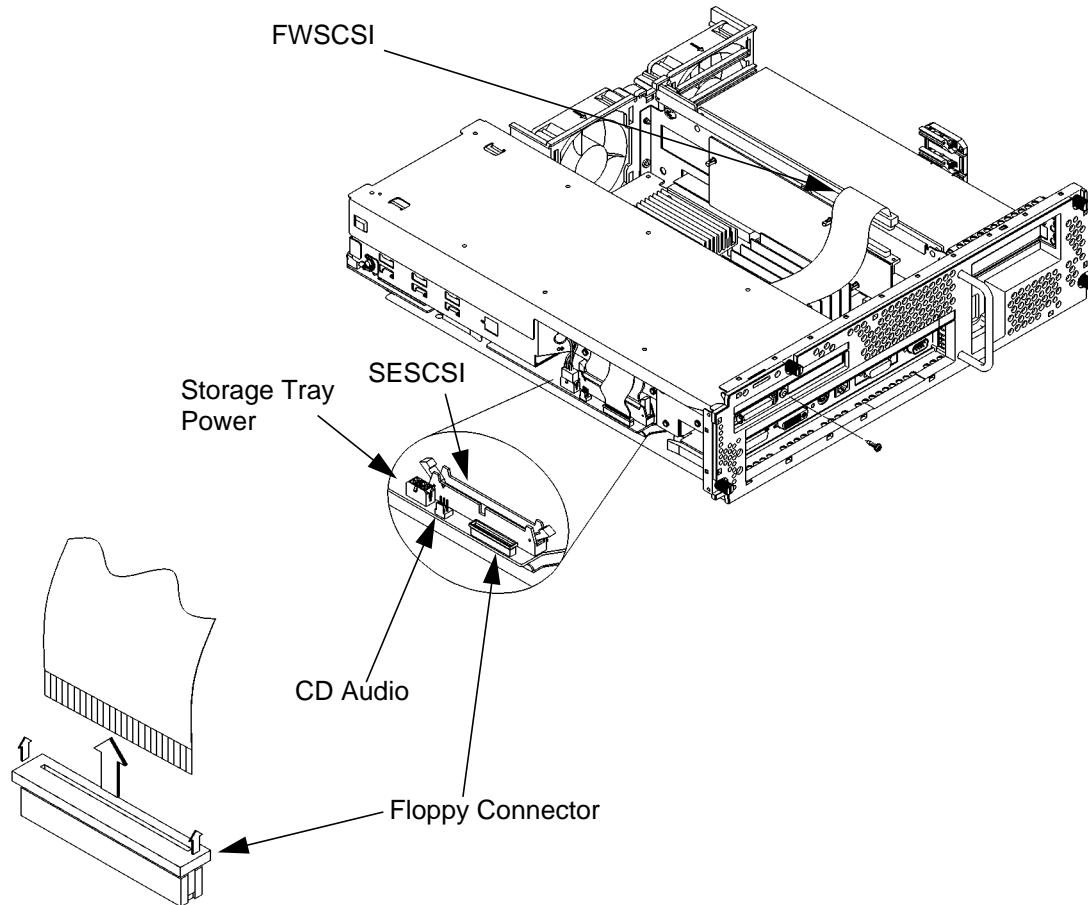
Figure 58   **Disconnecting the Storage Tray Assembly**

5   Hold the storage tray with both hands and slide it toward the front of the main tray approximately an inch, then lift it straight up to remove it.
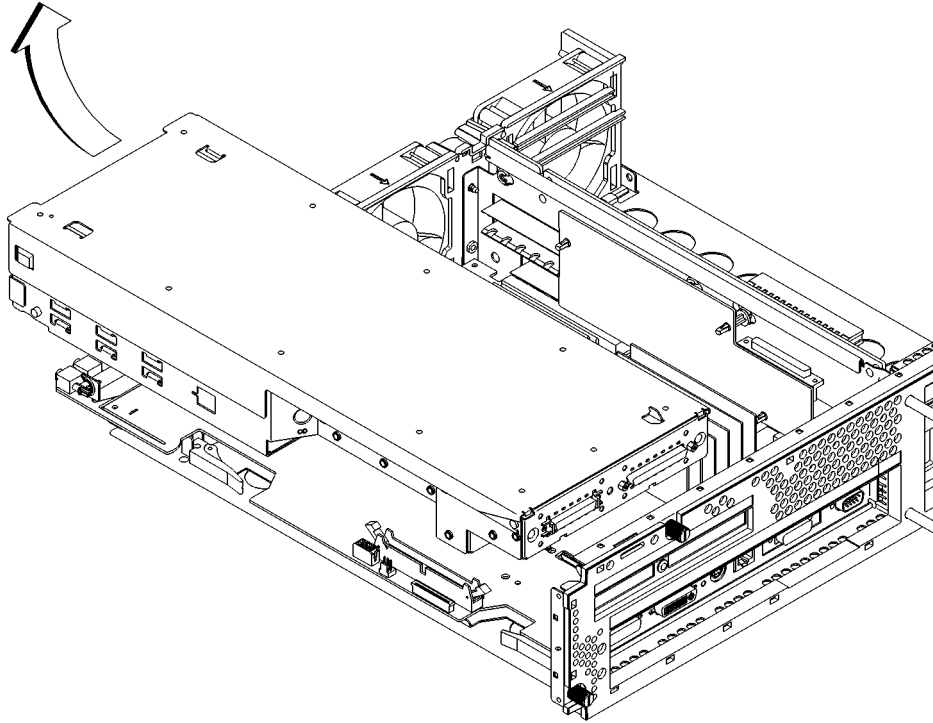
Figure 59   **Removing the Storage Tray Assembly**

6 Lift the clip and slip the battery out of its holder, as shown in Figure 60.

NOTICE:	Note the orientation of the battery. Make sure that you put the new battery in place with the positive (+) side facing up.
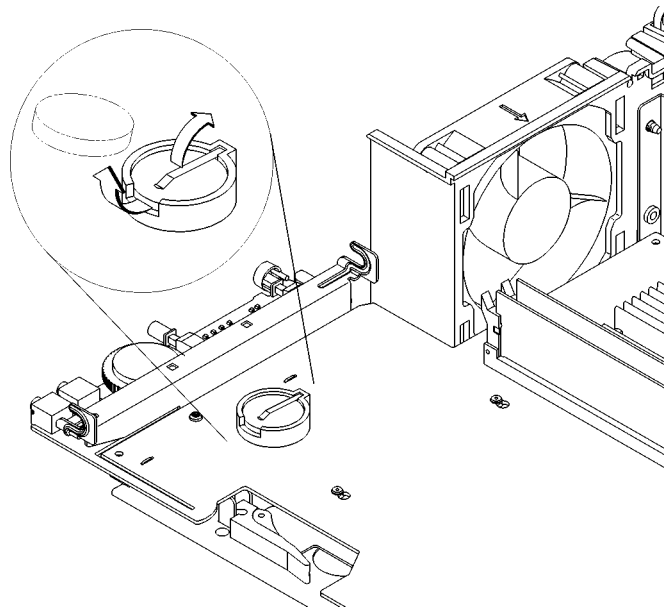
Figure 60   **Removing the Battery**

7 Insert the new battery in the holder with the positive (+) side facing up. (Only use HP part number 1420-0314 or equivalent.)

CAUTION:	Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.
ATTENTION:	Il y a danger d'explosion s'il y a replacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type recommandé par le constructeur. Mettre au rébut les batteries usagées conformément aux instructions du fabricant.

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8 Align the pins on the back panel of the main tray with the holes on the rear of the storage tray and slide the storage tray onto the pins, as shown in Figure 61.
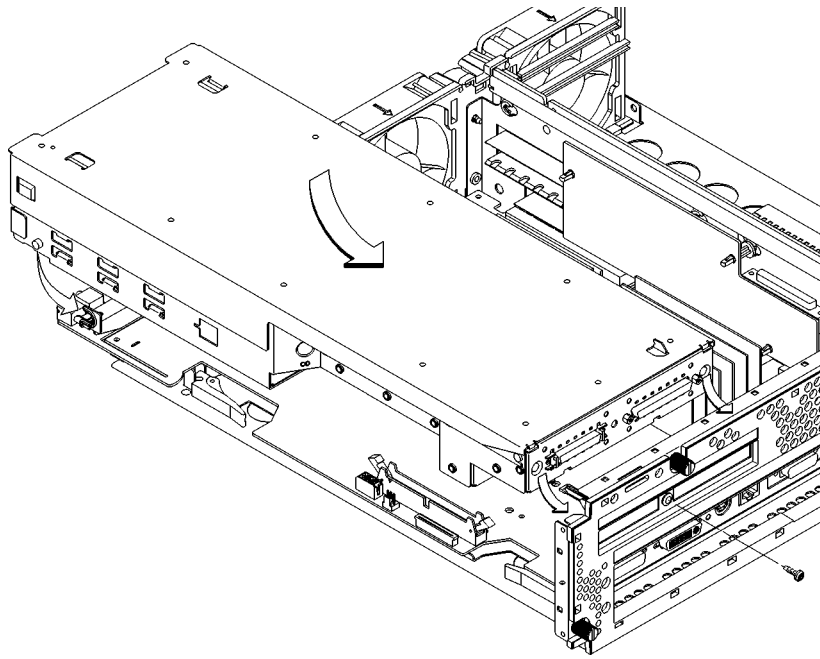
Figure 61   **Installing the Storage Tray Assembly**

9 Lower the front of the storage tray and move it slightly forward or backward to align the pins on its sides with the slots on the main tray, as shown in Figure 61.

10 Slide the storage tray towards the rear of the main tray until the pins are fully seated in the main tray slots, as shown in Figure 61.

11 Replace and tighten the storage tray retaining screw, as shown in Figure 61.

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12 Reconnect the floppy, SE SCSI, power, CD-ROM audio, and FW SCSI cables as shown in Figure 62.

When connecting the floppy cable to the system board, use the following procedure:

a Lift the locking ring on the connector to the up, or unlocked, position.

b While holding the locking ring in the unlocked position, insert the cable into the connector with the locking ring.

c Press down on the locking ring evenly on both ends until it snaps into the down, or locked, position.
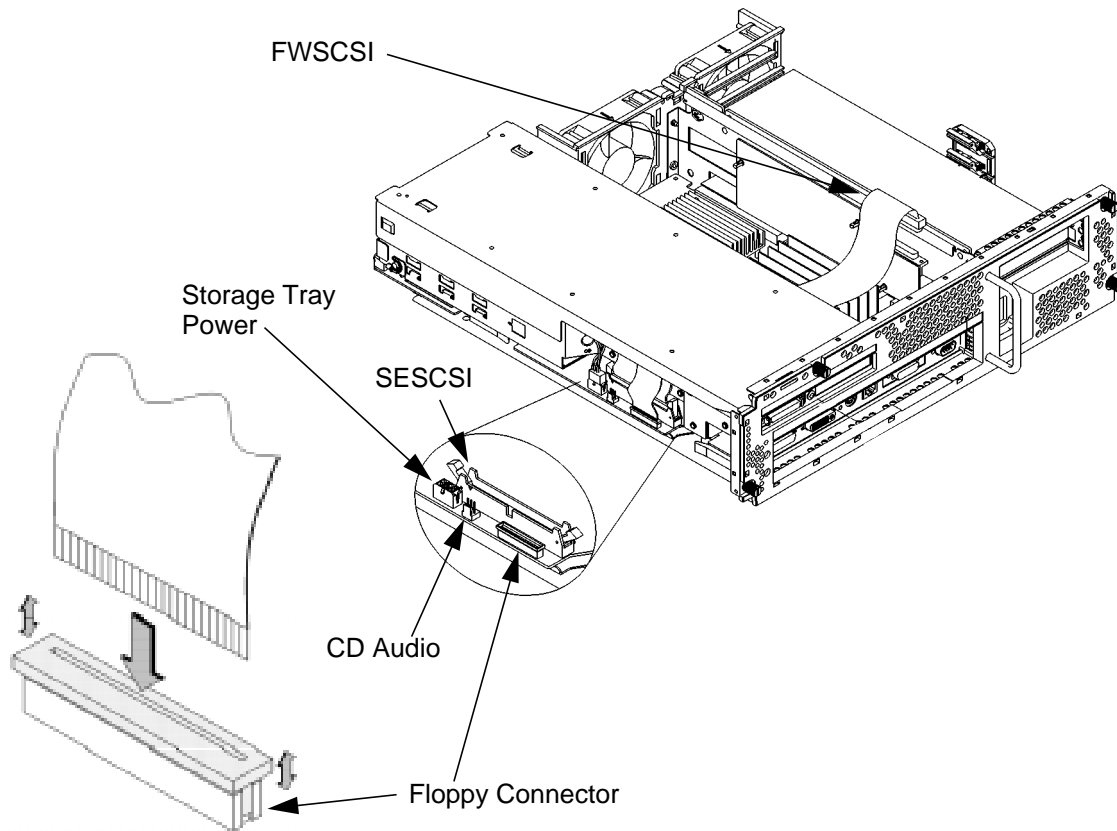
Figure 62   **Connecting the Storage Tray Cables**

13 Follow the instructions in Replacing the Main Tray Assembly on page 112.

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Installing the Optional EGRAM (Enhanced Graphics RAM) Module

Before you can install the EGRAM module you must perform the following procedures:

*   Removing the Main Tray Assembly on page 111

*   Removing the Storage Tray on page 117

Perform the following procedure to install the EGRAM module:

1   Install the standoffs into the four holes on the CPU board, as shown in Figure 63.
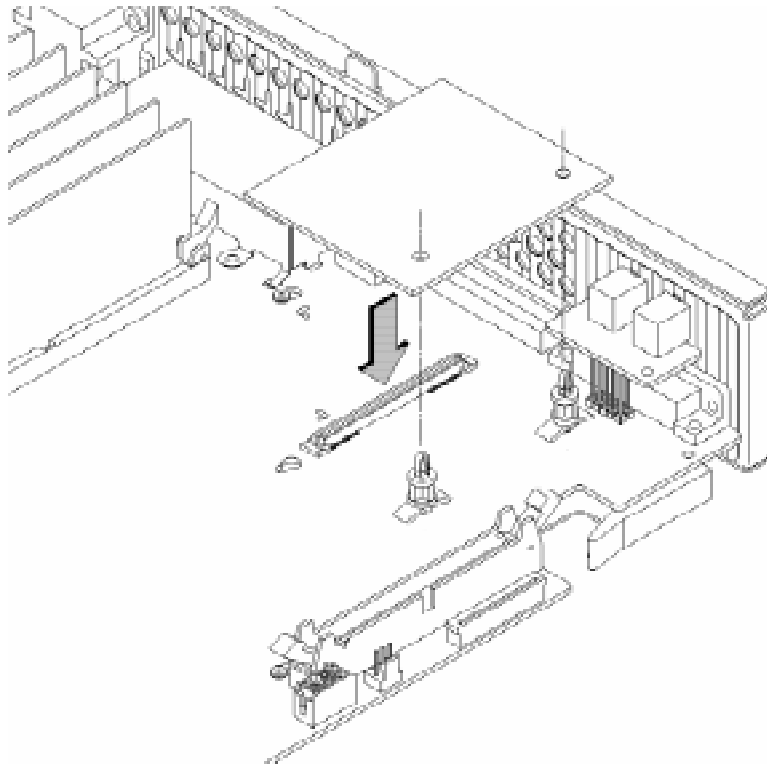
Figure 63   **Installing the Optional EGRAM Module**

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2   Line up the connector on the EGRAM module and the connector on the CPU board while at the same time aligning the standoffs to the holes in the EGRAM module, as shown in Figure 63.

3   Connect the EGRAM board to the CPU board. Press down firmly on the connector area and near the standoffs to make sure that the module is fully seated and that the standoffs are fully engaged with the EGRAM module.

4   Follow the instructions in Replacing the Storage Tray on page 133

5   Follow the instructions in Replacing the Main Tray Assembly on page 112

Installing the Optional Fast Wide Differential SCSI Controller

Before you can install the FWD SCSI controller (B132L/B160L only) you must perform the procedure described in Removing the Main Tray Assembly on page 111.

NOTE: You cannot use both the Ultra, Wide-SE SCSI and the Fast Wide Differential SCSI option at the same time.

Perform the following procedure to install the FWD SCSI controller:

1   Install the three standoffs, as shown in Figure 64.

2   Line up the connector on the FW SCSI controller and the connector on the CPU board while at the same time aligning the standoffs to the holes in the FWD SCSI controller, as shown in Figure 64.
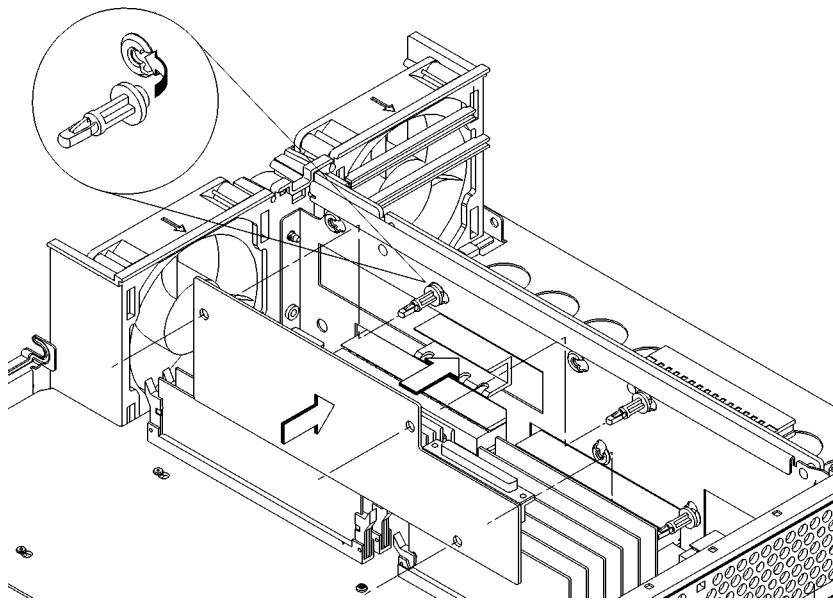
Figure 64   **Installing the Optional FWD SCSI Controller**

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3 Connect the FWD SCSI controller to the CPU board by pressing firmly on the connector area and near the standoffs to make sure that the FWD SCSI controller is fully seated and that the standoffs are fully engaged with the FWD SCSI controller.

4 Remove the storage tray cover by pressing in the two cover locking tabs then lifting the front end of the cover and sliding it forward off of the pins in the rear, as shown in Figure 65.
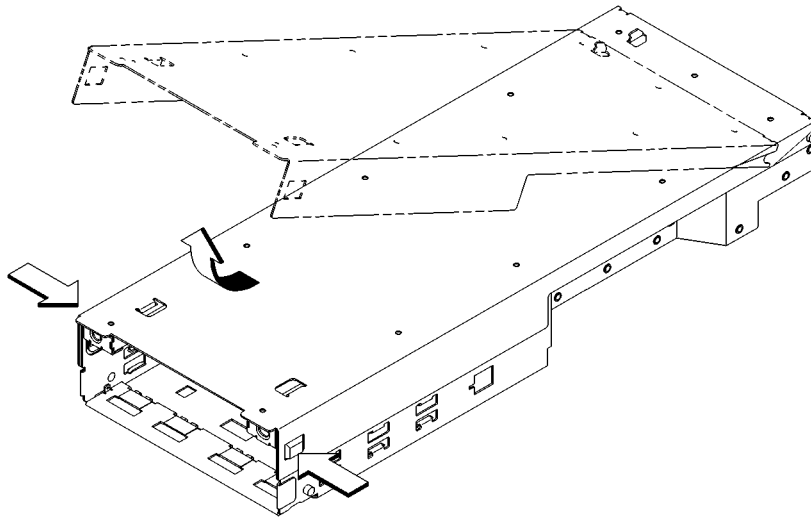
Figure 65   **Removing the Storage Tray Cover**

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5 Remove the two screws and remove the blank plate from the rear panel, as shown in Figure 66.
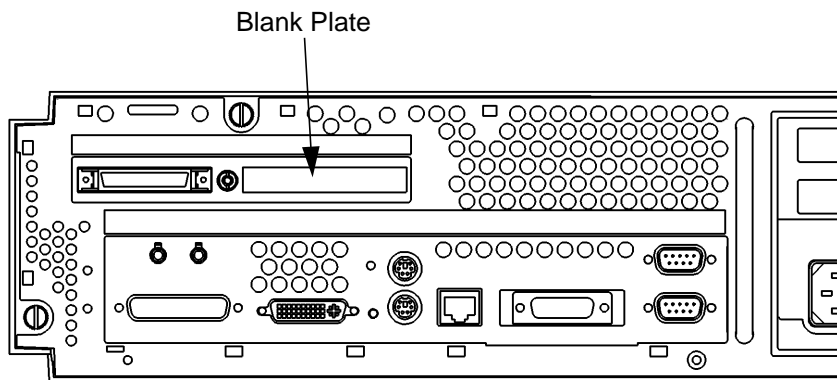
Blank Plate

Figure 66   **Removing the Blank Plate**

6 Connect the end of FWD SCSI cable to the FWD SCSI controller making sure
that the red line on the cable is toward the rear (away from the fans) of the main
tray, as shown in Figure 67.
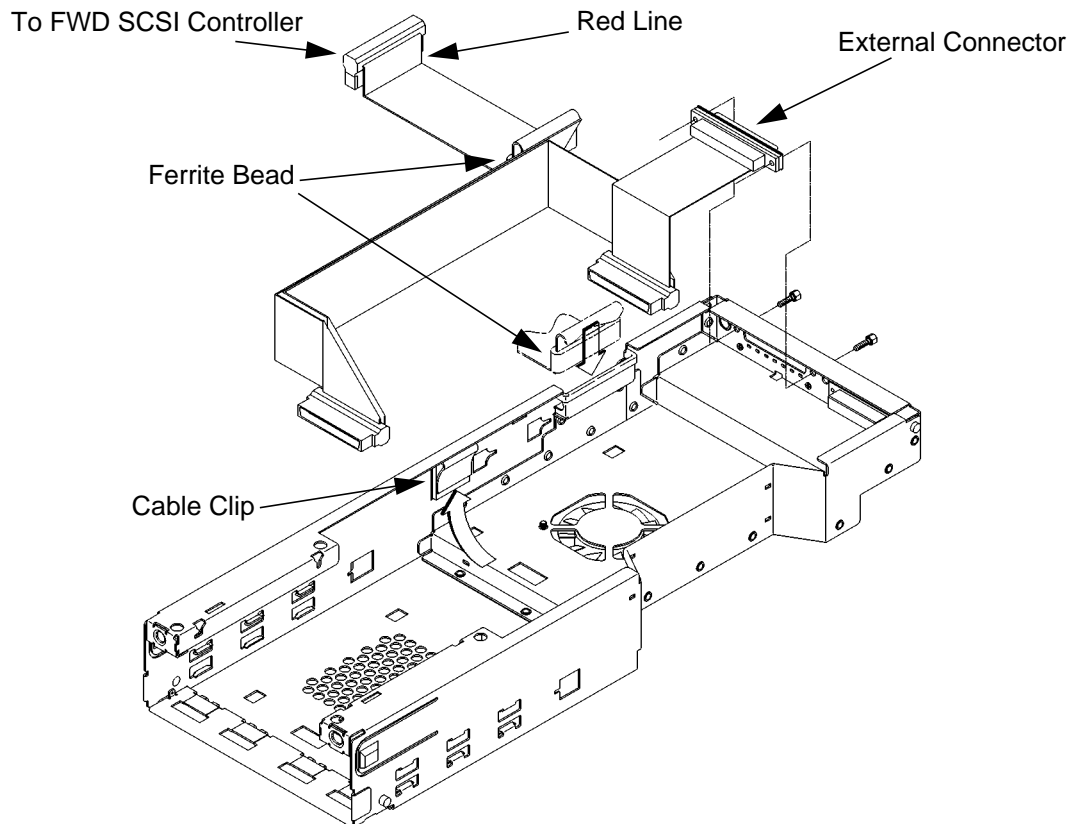
Figure 67   **Installing the FWD SCSI Cable**

7 Set the ferrite bead into the slot on the side of the storage tray. Make sure that the
cable is dressed so that it will not be damaged by the storage tray cover

8 Use the two hex standoffs to install the external connector on the end of the FWD
SCSI cable into the rear panel of the storage tray, as shown in Figure 67.

9 Secure the cable in the cable clip so that it does not interfere with the disk drives,
as shown in Figure 67.

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10 Slide the cutouts on the rear of the storage tray cover onto the pins on the storage tray and swing the cover into place, as shown in Figure 68.

11 Press down on the front edge of the cover to make sure that the locking tabs on the storage tray fully engage the cover.
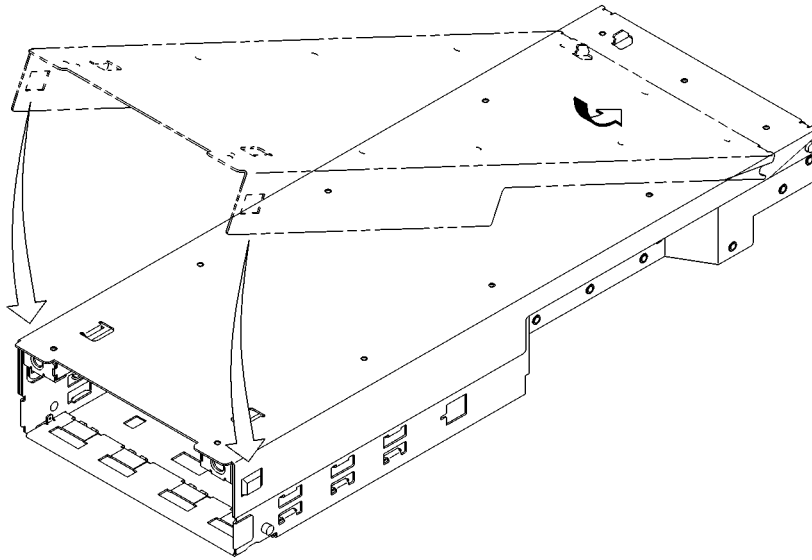
Figure 68   **Replacing the Storage Tray Cover**

12 If you are not connecting any external devices to the external FWD SCSI connector you must connect the FWD SCSI terminator.

13 Follow the instructions in Replacing the Main Tray Assembly on page 112

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 reconfigure 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, you need to perform the following:

Wait 2 seconds after the Num Lock light flashes near the end of the boot sequence, then press **Tab** (only press **Tab** once) to initiate the automatic monitor selection process.

The system cycles through the supported monitor types. Until the system tries a monitor type that is compatible with your monitor, the display is unreadable.

When you are able to read the information displayed, press the **Enter** key to stop the system from trying other monitor types. The system displays information similar to the following:

```
MONITOR INFORMATION
Path            Slot Head Type   Size     Freq Class
----            ---- ---- ---- --------- ---- -----
GRAPHICS(0)       0    1   12 1280x1024 72Hz
This is type 12 of 15 types.
Press [RETURN] to select this monitor type:
```

The system queries you to save the new monitor type. If the monitor type displayed is correct, press $\overline{\underline{\mathbf{Y}}}$ to save this monitor type.

```
MONITOR INFORMATION
Path            Slot Head Type   Size     Freq Class
----            ---- ---- ---- --------- ---- -----
GRAPHICS(0)       0    1   12 1280x1024 72Hz
This is type 12 of 15 types.
Press [RETURN] to select this monitor type:
Press [y] to save this monitor type:
```

If this is not the correct monitor type, press any other key to continue the search.

Changing the Console to External Terminal

In the event that your console stops displaying to your graphics device, use the following procedure to display to 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 top serial connector) on the system rear panel.

4   Power on the system.

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

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C

SCSI Connections

This appendix provides information about connecting Small Computer System Interface (SCSI) devices to an HP 9000 B132L/B132L+/B160L/180L workstation. It presents the information in the following sections:

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

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

If no external devices are connected to the external SCSI connectors on the rear panel of the workstation, a SCSI terminator must be installed.

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SCSI Bus Differences

A Small Computer Systems Interface (SCSI) bus is an IEEE standard bus for connecting your workstation to internal and external SCSI devices running at different speeds, singly or in combination. Examples of these SCSI devices are 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 SCSI (NSE SCSI) bus, and a fast, wide differential SCSI (FWD SCSI) bus or an ultra, wide, single-ended SCSI bus. Table 17 shows the specification differences between these SCSI buses, and Table 18 shows the SCSI addresses, ID numbers, and arbitration priorities for each.

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

Table 17   **SCSI Bus Differences**

Transfer Rate	Data Bus Width	Maximum Addresses*	Maximum Cable Length	Device Physical Location	Controller Embedded or Optional
Single-Ended Up to 5 Mbytes per second	8 bits	8	6.0 meters (19.6 feet)	Internal and external	Embedded
Fast, Wide Up to 20 Mbytes per second	16 bits	16	25 meters (82 feet)	Internal and external	Optional
Ultra, Wide-SE Up to 40 Mbytes per second	16 bits	16**	2.0 meters (6.56 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 18   **SCSI Bus Addresses, ID Numbers, and Arbitration Priorities**

SE SCSI Address	SCSI ID Number		Priority
	15 8	**7 . . . . . 0**	
7	. . . .	1	1
6	. . . .	. 1	2
5	. . . .	. . 1	3
4	. . . .	. . . 1	4
3	. . . .	. . . . 1 . . .	5
2	. . . .	. . . . . 1 . .	6
1	. . . .	. . . . . . 1 .	7
0	. . . .	 1	8
15	1	. . . .	9
14	. 1	. . . .	10
13	. . 1	. . . .	11
12	. . . 1	. . . .	12
11	. . . . 1 . . .	. . . .	13
10	. . . . . 1 . .	. . . .	14
9	. . . . . . 1 .	. . . .	15
8	 1	. . . .	16

8-bit Devices Single-Ended SCSI Bus

16-bit Devices Fast, Wide SCSI Bus

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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 externally connected 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 externally connected Fast, Wide Differential SCSI devices:

- 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 externally connected Ultra, Wide Single-Ended SCSI devices:

- C2978A cable with 0.5 meter (1.64 feet) length

- C2979A cable with 1.5 meter (5 feet) length

CAUTION:	SCSI cables approved by HP are designed to function within the SCSI tolerances for HP devices. Use of other cables can result in significant problems with system operation.

The NSE SCSI definition limits the total cable length of NSE SCSI cables to 6 meters (19.6 feet).

The FWD SCSI definition limits the total cable length of FWD SCSI cables to 25 meters (82 feet).

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

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

If you are daisy-chaining NSE 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 FWD 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 (1.6 feet) length
* C2979A cable with 1.5 meter (5 feet) length

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

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Connectors and Terminators

Any NSE SCSI device connecting to the system must use a 50-pin high-density thumb screw connector on the end connecting to the systems external connector.

Any FWD SCSI device connecting to the system must use a 68-pin high-density thumb screw connector on both ends.

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

NOTICE: If no external devices are connected to any SCSI connector on the back panel, a SCSI terminator must be installed. 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 a C2905A, 68-pin terminator for the FWD SCSI bus, a C2904A, 50-pin high density terminator for the NSE SCSI bus or a C2972A, 68-pin terminator for the ultra, wide-SE SCSI bus from Hewlett-Packard.

SCSI Configuration Constraints

You are limited to the 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:

*   NSE SCSI bus

*   Optional FWD SCSI bus

*   Ultra, wide-SE SCSI

Narrow-SE SCSI Bus Configuration Constraints

For the narrow-SE SCSI bus, HP-UX supports only one of each type of removable disk drive and two of the same type tape devices per system. Table 19 shows configuration constraints for each NSE SCSI device type. If the system has an internal CD-ROM drive, tape drive or hard disks connected to the SE SCSI bus, you must count them as SE SCSI devices.

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Table 19   **Narrow-SE SCSI Bus Configuration Constraints**

NSE SCSI Devices	Maximum Number of Each Type of Device Allowed
Hard Disk Drives (two internal)	7
CD-ROM Drives (one internal)	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 NSE SCSI Devices	7
NOTICE: Magneto-Optical Autochangers use three NSE SCSI drive address. Each address must be accounted for in the maximum number of SE SCSI devices allowed.	

CAUTION: Do not mix Narrow, Single-Ended SCSI, Fast, Wide Differential SCSI and Ultra, Wide Single-Ended peripherals on the same bus.

Fast Wide Differential SCSI Bus Configuration Constraints

FWD SCSI devices do not work with NSE SCSI devices.
Table 20 shows the configuration constraints for each FWD SCSI device type.

Table 20   **Fast, Wide Differential SCSI Bus Configuration Constraints**

FWD SCSI Devices	Maximum Number of Each Type of Device Allowed
FWD SCSI Disk Drive (two internal)	15
FWD SCSI Disk Arrays (addressed as single drive)	7

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CAUTION: Do not mix Narrow, Single-Ended SCSI, Fast, Wide Differential SCSI, and Ultra, Wide Single-Ended SCSI peripherals together on the same bus.

Ultra, Wide Single-Ended SCSI Bus Configuration Constraints

Ultra Wide-SE SCSI devices do not work with NSE SCSI or FWD SCSI devices. Table 20 shows the configuration constraints for each Ultra SCSI device type.

Table 21   **Ultra Wide Single-Ended SCSI Bus Configuration Constraints**

Ultra, Wide-SE SCSI Devices	Maximum Number of Each Type of Device Allowed
Ultra, wide-SE SCSI Disk Drive (two internal)	2
Ultra, wide-SE SCSI Disk Arrays (addressed as single drive)	1

CAUTION: Do not mix Narrow, Single-Ended SCSI, Fast, Wide Differential SCSI and Ultra, Wide Single-Ended SCSI peripherals together on the same bus.

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Determining SCSI Bus Length

This section helps you to determine the total length of the NSE SCSI bus and the FWD SCSI bus and the Ultra, wide-SE bus.

NSE SCSI Bus Length

Follow these instructions to calculate your total NSE SCSI bus length (including the system unit, external NSE SCSI devices, and NSE SCSI interconnect cables) using Table 22:

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 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 NSE 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 22   **Bus Length Worksheet for NSE SCSI Bus**

NSE SCSI Device	Internal NSE SCSI Bus Length meters (feet)	Device Internal Length meters (feet)	External Cable Length meters (feet)
System Unit	1.5 (4.9)	1.5 (4.9)	N/A
A2655A	0.3 (1.0)		
C1520B	0.2 (0.7)		
C1521B	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 6 meters [19.6 feet])

FWD SCSI Bus Length

Follow these instructions to calculate your total bus length for the FWD SCSI bus on your system, using Table 23.

1 List all of your internal FWD SCSI disk drives in the first column.

2 In the third column, write the lengths of the internal FWD SCSI bus that correspond to your devices.

3 In the fourth 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 section on "SCSI Restrictions.")

4 Add all of the numbers in the third column and write the sum on the subtotal line

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at the bottom of the column. Do the same for the fourth column.

5 Add the subtotals together and write the total on the Total FWD SCSI Bus Length line.

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, try configuring your installation with shorter cables.

If you have problems, call your designated service representative.

Table 23 **Bus Length Worksheet for FW SCSI Bus**

FWD SCSI Device	Internal FWD SCSI Bus Length meters(feet)	Device Internal Length meters(feet)	External Cable Length meters(feet)
System Unit	1.5 (4.9)	1.5 (4.9)	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 bus length for the UW-SE SCSI bus on your system, using Table 23.

1 List all of your internal UW-SE SCSI disk drives in the first column.

2 In the third column, write the lengths of the internal UW-SE SCSI bus that correspond to your devices.

3 In the fourth column, write down the lengths of the UW-SE SCSI interconnect cables you are using for your installation. (Cable lengths are listed in subsection "Cables" in the section on "SCSI Restrictions.")

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4   Add all of the numbers in the third column and write the sum on the subtotal line at the bottom of the column. Do the same for the fourth column.

5   Add the subtotals together and write the total on the Total UW-SE SCSI Bus Length line.

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

If you have problems, call your designated service representative.

Table 24   **Bus Length Worksheet for UW SCSI Bus**

UWSE SCSI Device	**Internal UWSE SCSI Bus Length meters(feet)**	**Device Internal Length meters(feet)**	**External Cable Length meters(feet)**
System Unit	1.5 (4.9)	1.5 (4.9)	N/A
Device _____	1.0 (3.3)		
Device _____	1.0 (3.3)		
Device _____	1.0 (3.3)?		

Subtotals: _____   + _____

TotalUW-SE SCSI Bus Length   =   _____

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

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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   In a terminal window, 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:

```
H/W Path          Class          Description
============================================================
8                 bc             Pseudo Bus Converter
8/0               unknown        Processor
8/12              ext_bus        GSC Fast/Wide SCSI Interface
8/12.6            target
8/12.6.0          disk           HP   C3325W
8/12.7            target
8/12.7.0          ctl            Initiator
8/16              ba             Core I/O Adapter
8/16/0            ext_bus        Built-in Parallel Interface
8/16/1            audio          Built-in Audio
8/16/4            tty            Built-in RS-232C
8/16/5            ext_bus        Built-in SCSI
8/16/5.6          target
8/16/5.6.0        disk           Quantum VP32210
8/16/5.7          target
8/16/5.7.0        ctl            Initiator
8/16/6            lan            Built-in LAN
8/16/7            ps2            Built-in Keyboard/Mouse
8/16/10           pc             Built-in Floppy Drive
8/16/10.2         floppy         HP_PC_FDC_FLOPPY
8/20              ba             Core I/O Adapter
8/20/1            hil            Built-in HIL
8/20/2            tty            Built-in RS-232C
8/20/5            ba             EISA Bus Adapter
8/24              graphics       Graphics
62                processor      Processor
63                memory         Memory
```

2   Determine which SCSI IDs are currently in use by looking under the H/W Path heading.

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NSE SCSI Device IDs

Before assigning a NSE SCSI device ID to your drive, you need to check your NSE SCSI device IDs. To check what SCSI device IDs are available and assign an ID to your device, follow these instructions which use Table 25:

1   Write in the NSE SCSI device ID of any internal drives in Table 25

2   Write in the type of external drives (SE SCSI, FW SCSI or Ultra SCSI) currently connected to your system under the heading "External Device Drives" and each drive's SCSI device ID under the heading "Device ID."

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 NSE 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 existing 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. It is reserved for the built-in SCSI bus controller

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Table 25   **Single-Ended SCSI Device IDs**

SCSI Device Drives	Internal Device ID (Address) Number (Only 0 through 6 Available)	External Device ID (Address) Number (Only 0 through 6 Available)
Internal System Drives:		
System SCSI Drive(s)	_____	_____
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		
	N/A	_____
1st _____	N/A	_____
2nd _____	N/A	_____
3rd _____	N/A	_____
4th _____	N/A	_____
5th _____	N/A	_____
6th _____	N/A	_____
7th _____	N/A	_____
NOTICE: You can have no more than 7 single-ended SCSI devices (internal and external) connected to the system.		

5 Write in the SCSI device ID of any internal drives in Table 25.

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."

7 Add your new drive to the table if it is an external device. If it is an internal drive, continue to Step 8.

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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.

FWD 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 26.

1 Write in the type of internal drives currently connected to your system under the heading "Fast, Wide SCSI Device Drives" and each drive's SCSI device ID under the heading "Device ID."

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 26   **Fast, Wide SCSI Device Drives and Device ID**

Fast, Wide SCSI Device Drives	Device ID (Address) Number (ID 7 not available)
1st Internal Device _____	_____
2nd Internal Device _____	_____
NOTICE: You can have no more than 15 SCSI devices connected to a fast, wide 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 26.

1   Write in the type of internal drives currently connected to your system under the heading "Ultra SCSI Device Drives" and each drive's SCSI device ID under the heading "Device ID."

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 ultra, wide single-ended SCSI device ID to your drive. Refer to the drive's installation documentation for information on changing the device ID.

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

Table 27   **Ultra Wide SE SCSI Device Drives and Device ID**

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

Connecting to the SCSI Ports

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

SCSI Port Connection

The system contains three (3) external SCSI connectors:

- Narrow, Single-Ended SCSI Connector

- Fast, Wide Differential SCSI Connector

- Ultra, Wide Single-Ended SCSI Connector

Figure 69 shows the two SCSI connectors. SCSI cables connect to these ports with a high-density thumb screw connector.

FW SCSI or
UW SCSI Connector
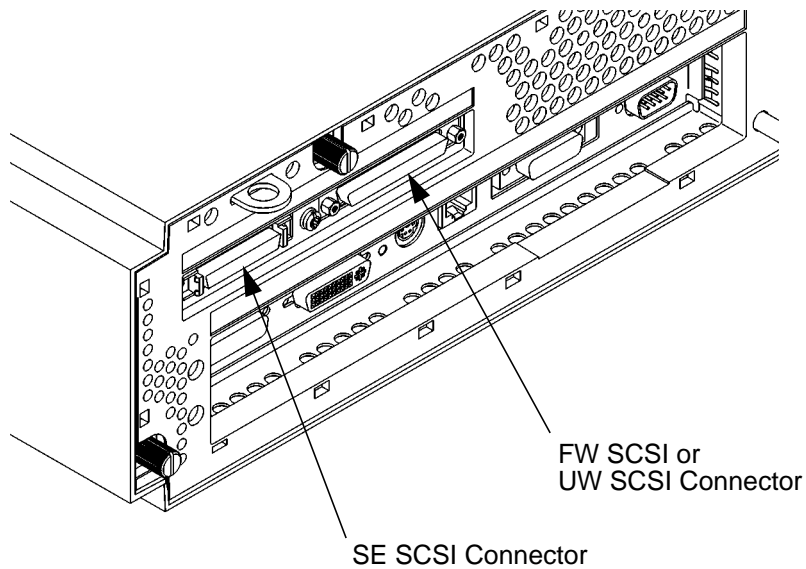
SE SCSI Connector

Figure 69   **Rear Panel SCSI Connectors without Terminators**

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NOTICE: If no external devices are connected to the SCSI connectors on the back panel, a SCSI terminator must be installed. The last device connected to the SCSI bus must be terminated with a SCSI terminator.

If you do not already have a SCSI terminator, you must order a C2905A, 68-pin terminator for the FWD SCSI bus, a C2904A, 50-pin high density terminator for the NSE SCSI bus or a C2972A, 68-pin high density terminator for the Ultra, Wide, Single-Ended SCSI bus.

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
- Configure and display LAN setting
- Displaying system information
- Displaying PIM information

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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, GSC, and PCI 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.

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```
------ Main Menu -------------------------------------------------
Command                     Description
-------                     -----------
BOot [PRI|ALT|<path>]       Boot from specified path
PAth [PRI|ALT|CON|KEY][<path>]Display or modify a path
SEArch [DIsplay|IPL] [<path>] Search for boot devices

COnfiguration [<command>]   Access Configuration menu/commands
INformation [<command>]     Access Information menu/commands
SERvice [<command>]         Access Service menu/commands

DIsplay                     Redisplay the current menu
HElp [<menu>|<command>]     Display help for menu or command
RESET                       Restart the system
------
Main Menu: Enter command >
```

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```
------ Configuration Menu -------------------------------------------
Command                        Description
-------                        -----------
AUto [BOot|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 >
```

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```
------ 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                 Dispay I/O interface information
LanAddress         Display built-in system LAN address
MEmory             Display memory information
PRocessor          Display processor information
WArnings           Display selftest warning messages

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
------
Information Menu: Enter command >
```

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```
------ 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:

This procedure should be done by a system administrator.

1 Close any files and applications on your workstation.

2 Use the **shutdown -h** command as root user to shut down your system. When shutdown is complete, press the power switch on the front panel of the system unit.

NOTICES: 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 boot console 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 device.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.

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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**

    The operating system on the specified device is used to start your workstation.

*   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)>

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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 optional fast, wide differential SCSI bus, or the built-in ultra, wide-SE SCSI bus (Model B180L only).

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

lan is all connections to the built-in LAN.

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

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Resetting Your Workstation

To reset 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 > reset
```

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 28.

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

Table 28   **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 **con**	Your workstation's primary display device
keyboard or **key**	Your workstation's primary ASCII input device

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

```
Main Menu: Enter command > path
```

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The paths are displayed in **Mnemonic Style Notation,** as shown in Table 29.

Table 29 **Mnemonic Style Notation**

I/O Type	Specification Format
Built-in FWSCSI	**fwsci.**scsi_address**.**logical_unit_number
Built-in UWSCSI	**fwsci.**scsi_address**.**logical_unit_number
Built-in SCSI	**sescsi.**scsi_address**.**logical_unit_number
Optional	**gsc**n**.**scsi_address**.**logical_unit_number
Optional	**pci**n**.**scsi_address**.**logical_unit_number
Built-in LAN	**lan.**server_address**.**init_timeout.io_timeout

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 28.

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 28 and *path* is the specification of the path in Mnemonic Style Notation (as described in Table 29). 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:

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

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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;

> **monitor**

The correct usage for setting the graphics configuration is:

> **monitor** *graphics_path type*

where valid *graphics_path* parameters are:

graphics(0) - The built-in 8-plane graphics adapter.

graphics(1) and *graphics(2)* - Graphics adapters installed in option slots 1 and 2.

and *type* is the numerical monitor type

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When a dual display graphics adapter (an adapter which has two video output connectors) is installed, the video connector on the left (when looking at the system from the rear) is *graphics(NA)* and the video connector on the right is *graphics(NB)*. Where *N* is the slot number in which the graphics adapter is installed.

For example, a Dual Visualize Enhanced Graphics Card (A4451A) installed in option slot 1 would be *graphics(1A)* and *graphics(1B)*.

NOTICE: There are graphics configuration restrictions of which you must be aware when adding graphics adapters or reconfiguring your graphics devices. For details on graphics configuration restrictions, see the subsection "Graphics Configuration Restrictions" in Appendix B.

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(0)     0     1   f8000000   1280x1024   72Hz   12


Configuration Menu: Enter command >
```

In this example, only the built-in graphic adapter graphics(0) is configured. The monitor type for graphics(0) 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,Greyscale
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,Greyscale
GRAPHICS(0)    0    1   10 1200x1600  75Hz  VESA
GRAPHICS(0)    0    1   11 1200x1600  75Hz  VESA,Greyscale
GRAPHICS(0)    0    1   12 1280x1024  72Hz
GRAPHICS(0)    0    1   13 1280x1024  72Hz  Double buffered
GRAPHICS(0)    0    1   14   640x480  60Hz
GRAPHICS(0)    0    1   15 --------user defined-------

Configuration Menu: Enter command >
```

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

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

```
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.
```

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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:

If your keyboard connects to the PS/2 connector on your system, wait 2 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**.

```
MONITOR INFORMATION


   Path        Slot  Head   Type      Size     Freq Class
-----------    ----  ----   ----   ----------  ---- -----
GRAPHICS(0)     0     1      n       nnnnxnnnn  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**.

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Changing the Console to External Terminal

In the event that your console stops displaying to your graphics device, use the following procedure to display to 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 top serial connector) on the system rear panel.

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 a memory configuration table with properly-installed and configured memory (Sample Output 1).

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 of configured.

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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      128MB        Configured
  1a/b       64MB        Configured
           ---------
  TOTAL     192MB

  Active, installed memory (bytes)  :   201326592 of Standard DRAM

       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, similar to the example below.

```
I/O MODULE INFORMATION

                                                         IODC IODC
Path         Decimal Type                    Location   HVER SVER Vers Dep
------------ ------- ----------------------- ---------- ---- ---- ---- ----
8            8       Bus Converter           built-in   5040 0000 0x00 0x00
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
HIL          8/20/1  HIL                     built-in   0170 7300 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
----       ----                        -------
20/5/1     Unknown EISA card or slot empty

PCI Cards

Slot      Path                            Bus  Class
--------  ------------------------------- ---  -----------------
built-in  8/0/19/0                          0  SCSI
built-in  8/0/20/0                          0  Ethernet
```

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Setting the Auto Boot and Auto Search Flags

auto boot and **auto search** are variables stored in your workstation's non-volatile 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**.

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Autosearch searches for devices in the following order:

> Primary boot path
>
> Alternate boot path
>
> Built-in fast, wide SCSI devices
>
> SCSI card in slot 1
>
> SCSI card in slot 2
>
> 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**

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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 (B132L+/B180L 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 or 10 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 Mbits/sec network speed and full duplex mode, type the following at the prompt:

> Configuration Menu: Enter command > **LanConfig 10/Full_dx**

To select 100 Mbits/sec network speed and half duplex mode, type the following at the prompt:

> Configuration Menu: Enter command > **LanConfig 100/Half_dx**

To select 100 Mbits/sec 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 Mbits/sec, half duplex only), type the following at the prompt:

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`Configuration Menu: Enter command >` **LanConfig AUI**

NOTE:	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 BOot 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

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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. Strict-ly 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 firmware 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.

CDE The Hewlett-Packard Common Desktop Environment.

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, ex-

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cept 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

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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**.

CRX color graphics Expanded graphics capability offering 24-plane color, 24-plane Z-buffered color, or 48-plane Z-buffered color capability.

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) cas-

settes.

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

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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**.

EISA (Extended Industry Standard Architecture) An industry standard bus architecture based on and compatible with that used by IBM in their AT series computers.

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.

fast, differential SCSI An 8-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 10 MB per second. *See also* **fast-wide SCSI**, **single-ended standard SCSI**, **Small Computer System Interface**.

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* **fast, differential SCSI**, **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**,

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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.

firmware The control software that is embedded in ROM and is always resident despite the status of the operating system. It handles the booting of the system, initialization of I/O, and starts the loading of the operating system.

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.

HCRX color graphics Accelerated 8-plane or 24-plane graphics. *See also* **CRX color graphics**.

Help Manager The HP VUE applica-

tion 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*, or /home/*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

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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 system 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 pass-

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word.

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**.

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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 pro-

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gram 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, differential SCSI**, **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 combi-

nation. *See also* **fast, differential SCSI**, **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.

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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 op-

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eration of windows on the HP VUE
Workspace. The Workspace Manager is
a special Window Manager. *See also*
Window Manager.

workstation A compact, graphics-ori-
ented 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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