HEWLETT PACKARD

HP 9000
Series 700

Model 755 Owner's Guide

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HP 9000 Series 700
Model 755
Owner's Guide

HEWLETT PACKARD

Workstation Systems Group

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Preface

This owner's guide describes how to use your HP 9000 Series 700 Model 755 workstation.

This manual assumes that you have installed your workstation as described in the *HP 9000 Series 700 Model 755 Hardware Installation Guide.*

Audience

This guide is intended for users of HP 9000 Series 700 Model 755 workstations.

Safety and Regulatory Statements

See Appendix A in the back of this manual for the safety and regulatory statements that apply to the HP Series 700 Model 755 workstations.

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

For more information, refer to the following manuals:

- *HP 9000 Series 700 Model 755 Hardware Installation Guide* (A2288–90600)
- *HP Visual User Environment User's Guide* (B1171–90061)
- *Installing and Updating HP–UX* (B2355–90039)
- *Managing Clusters of HP 9000 Computers: Sharing the HP–UX File System* (B2355–90038)
- *System Administration Tasks HP 9000 Series 700 Computers* (B2355–90040)
- *Using HP–UX* (B2910–90001)

To order manuals, please contact your local sales office.

Revision History

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

Edition	Revision History
E0493	First Printing.
E0894	Added information on Model 755/125

Problems, Questions, and Suggestions

If you have any questions or problems with our hardware, software, or documentation, please contact either your HP Response Center or your local HP representative.

You may also use the Reader's Response Form at the back of this manual to submit comments about our documentation.

Documentation Conventions

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

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

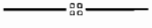
user–supplied values Italic words or characters in formats and command descriptions represent values that you must supply.

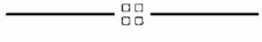
sample user input In examples, information that the user enters appears in color.

`output` Information that the system displays appears in `this typeface`.

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

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

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



Chapter 1
System Overview

This chapter introduces the HP 9000 Series 700 Model 755 workstation. Its purpose is to familiarize you with your workstation and its controls and indicators and give an overview of some of the system's networking capabilities.

Included in this chapter are the following topics:

- Workstation description
- System unit front panel controls
- System unit rear panel controls
- Available keyboards and their differences
- Networking overview

Product Description

The Model 755 workstation provides high performance, expandability, and large RAM and optional storage capability. It is configurable as a deskside workstation or a server, with a maximum of 2 full height 5 1/4–in. SCSI–2 devices and 2 half height devices. It is source code– and binary code–compatible with the Series 700 product family. Model 755 workstations contain the following key features:

- Graphics Options — 19–inch 1280x1024 72 Hz color monitor with one of:
  24–plane CRX color graphics
  Dual 24–plane CRX color graphics
  24–plane CRX color graphics with accelerator, Z–buffer
  24–plane double buffered 2D/3D color graphics
- Main Memory — 12 slots, pair–expandable from 64 MB to 768 MB RAM in 64 MB or 128 MB increments
- Mass Storage
  1.3–GB single–ended SCSI disk
  2.0–GB single–ended SCSI disk
  2.0–GB fast, wide SCSI disk
  Optional 1.0–GB, 2.0–GB single–ended 3.5 inch disk drive
  Optional 1.0–GB, 2.0–GB fast, wide 3.5 inch disk drive
  Optional 600–MB CD–ROM disk drive
  Optional 2.0–GB DDS–format 4–mm tape drive
  Optional 4.0– to 8.0–GB DDS–format 4–mm tape drive (with data compression)
  Optional 3.5–inch 1.4–MB flexible disk drive
- Core I/O
  Single–ended SCSI port (supports up to 7 devices)
  Fast, wide SCSI port (supports up to 15 devices)
  Two 9–pin RS–232C ports
  ETHERNET IEEE 802.3 LAN ports jumper selectable to either AUI LAN (Thick Net) or BNC (Thin LAN)
  One 25–pin HP parallel port
  CD–quality audio input/output
- Expansion
  Two SGC slots (slot 0 for CD–quality audio board and optional FDDI adaptor)
  Four EISA slots
- Operating Systems — HP–UX, DOS / OS/2 emulation

Figures 1–1 and 1--2 show the front and back views of the workstation.

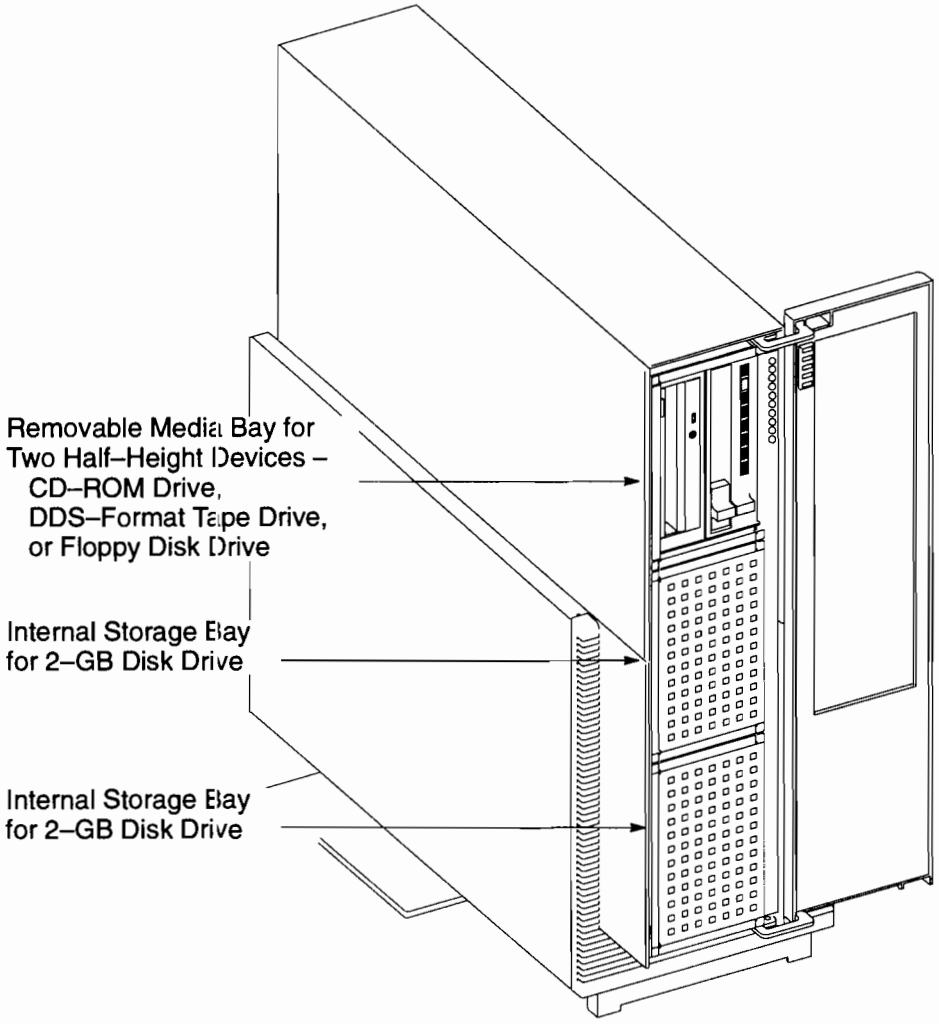


Figure 1–1. Front View with Door Open

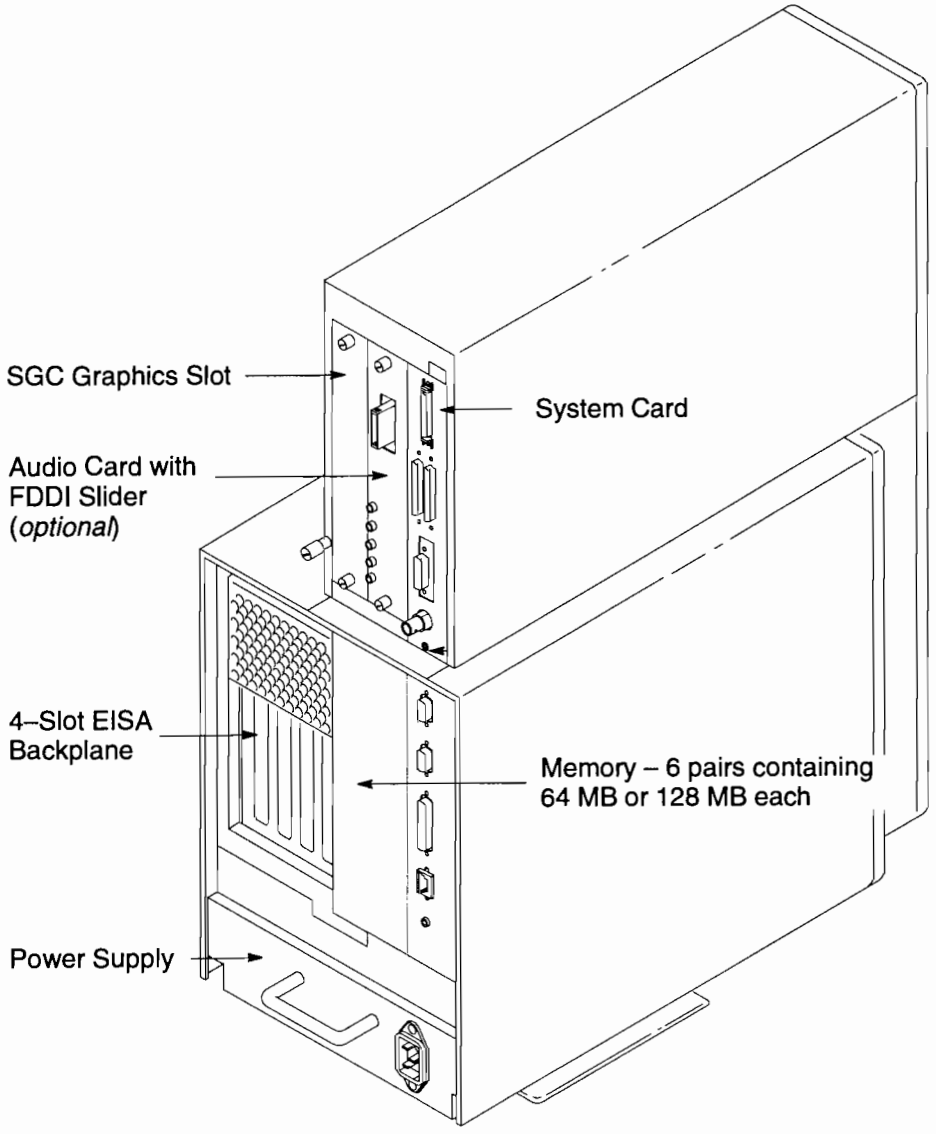


Figure 1–2. Rear View

System Unit Front Panel Controls

Before powering on your system, you should become familiar with the system unit controls. This section describes the front panel switches and indicators. They are:

- Power switch
- LEDs

Figure 1–3 shows locations of the front panel power switch and LEDs. Immediately following Figure 1–3 is an explanation of how each works.

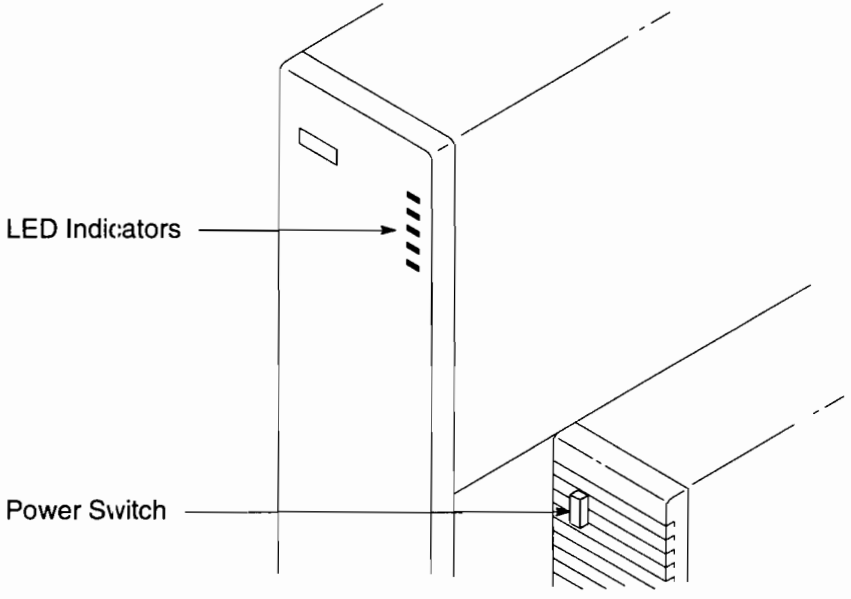


Figure 1–3. Front Panel Power Switch and LEDs

Power Switch

Use the Power switch to turn the power to the system unit on and off. The power Light Emitting Diode (LED) lights green when the system unit is powered on.

LED Indicators

The front of the system unit has five LED indicators, or simply LEDs: one green, and four amber. Next to the four amber LEDs is a symbol representing the activity associated with that LED. The green LED is not labeled. When lit, this LED indicates that the system power is on. Table 1–1 lists what system activity each LED symbol represents. The LEDs described in Table 1–1 represent normal system activity. For information on LED error codes see Chapter 8, "Solving Problems."

Table 1–1. LED Display During Normal System Activity

LED Activity	Meaning
1 ▬	Power On LED (not labeled)
2 ▬ ⇢	Network Transmit In Progress
3 ▬ ⇠	Network Receive In Progress
4 ▬ ◈	Disk Access In Progress
5 ▬ ♡	Operating System Running
▬ = LED On or Flashing	

System Unit Rear Panel Connectors

The back of the system unit contains connectors that allow you to attach peripherals to your workstation. This section describes those rear panel connectors and switches. They are:

- FDDI connector
- SCSI connectors
- Audio connectors
- 802.3 network connectors
- Reset (TOC) switch
- RS–232C serial I/O ports
- HP Parallel I/O Port
- HP–HIL connector
- Tone Ext (Audio) connector
- System ac connector
- EISA card connector
- Graphics device connector

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

Figure 1–4 shows the location of the connectors on the system unit's rear panel. Immediately following Figure 1–4 is an explanation of each connector. Figure 1–5 shows the audio connectors, Figure 1–6 provides a close–up of the system ac connector and EISA card connector, and Figures 1–7 and 1–8 show the two types of graphics device connectors.

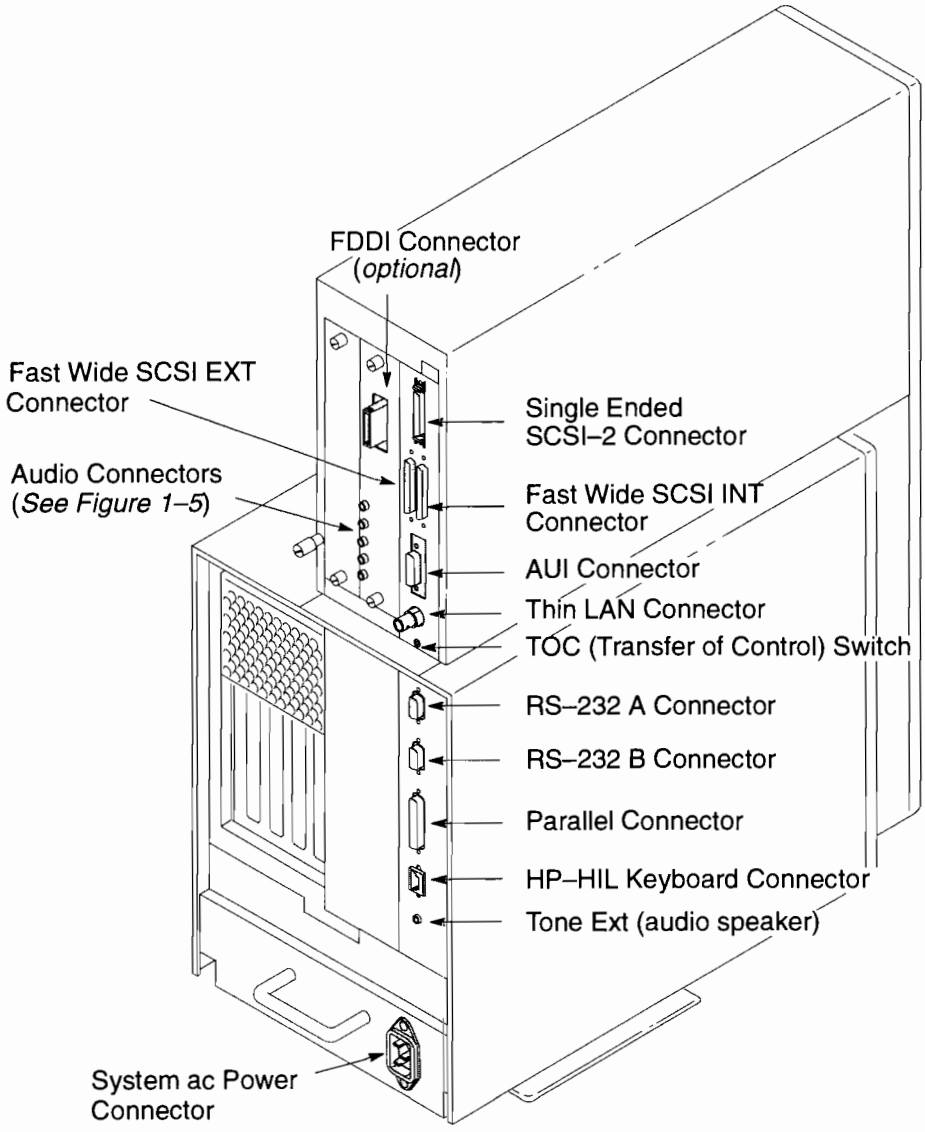


Figure 1–4. System Unit Rear Panel Connectors

FDDI Connector

The Fiber Distributed Data Interface (FDDI) connector is used to connect an optional FDDI adaptor. This is a LAN device that meets an ANSI standard allowing it to transmit 100 million bits per second. For more information on FDDI, see the installation instructions that come with the adaptor.

SCSI Connectors

Use the Small Computer Systems Interface (SCSI) connector to connect internal and external SCSI–2 devices such as DDS–format tape drives and CD–ROM drives. See the instructions that come with each SCSI–2 device for more information on using them.

- Single–Ended SCSI – An eight–bit wide bus with standard receivers and drivers. Total cable length limit is 6 meters.
- Optional Fast Differential SCSI – An eight–bit wide bus with high power receivers and drivers. Total cable length limit is 25 meters with a speed of up to 10 mb per second. When these devices are connected to the EISA, and depending upon the application, the speed is typically 6 mb per second.
- Optional Fast, Wide SCSI – A sixteen–bit wide bus with high power receivers and drivers. Total cable length limit is 25 meters with a speed of up to 20 mb per second.

NOTICE: When attaching external SCSI devices, be sure to terminate the last device on the external SCSI bus. If you are not connecting any external devices to the single–ended or fast,wide SCSI connectors, you must install the appropriate SCSI terminators shipped with the system unit. For more information, see the *Installing Peripherals* manual.

Audio Connectors

Your Model 755 Workstation has CD–quality audio input and output capability through input and output connectors on the rear panel and an internal speaker (see Figure 1–5). A microphone for audio input is not supplied with your workstation. The audio connectors are standard 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 Model 755 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 Inputs — Line–in
  Mono microphone with 1.5V phantom supply
  CDROM audio (if internal CDROM is installed)
- Audio Outputs — Line–out
  Headphone
  Mono speaker jacks
  Built–in mono speaker
- Audio CODEC — Crystal CS4215

The audio electrical specifications for the Model 755 workstation are summarized in Table 1–2

Table 1–2. Audio Electrical Specifications

Frequency Response	25–20,000Hz
Input Sensitivity/Impedance	
Line in	2.0Vpk/47kohm
Microphone	22mVpk/1kohm
Max Output Level/Impedance	
Line Out	2.8Vpp/47kohm
Headphone	2.75Vpp/50ohm
Speaker (internal)	5.88Vpp/48ohm
Speaker (external jack)	4.2Vpp/8ohm
Output Impedence	
Line Out	619ohm
Headphone	118ohm
Speaker (external jack)	11ohm
Signal to Noise*	
Line Out	65dB
Headphone	61dB
Speaker	63dB
Line in	61dB
Microphone	57dB
THD (w nominal load)	
Line Out	–73dB
Headphone	–70dB
Speaker	–68dB
Line in	–75dB
Microphone	–73dB

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

$$n = \frac{dB}{20 \log_{10}} \approx \frac{dB}{6}$$. For example, for 61dB S/N then n= 61/6 $\approx$ 10 significant bits, or in other words, about 6 bits of noise.

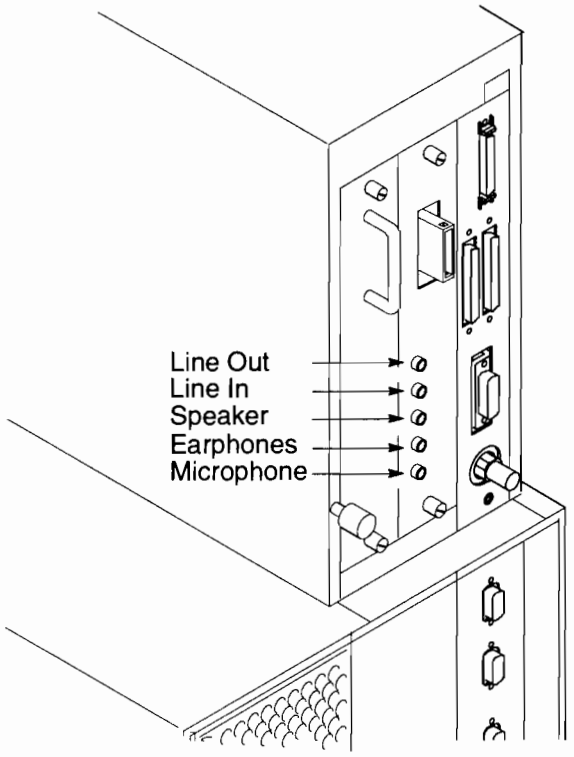


Figure 1–5. Audio Connectors

802.3 Network Connectors

Use the 802.3 ETHERNET network connector to attach the system to the network. You can use only one of either the AUI LAN (Thick Net) connector or the Thin LAN (BNC–type) connector, depending on the type of cabling used at your location.

To change from one LAN type to another, see Appendix B of this guide for instructions on changing your hardware configuration.

TOC (Transfer of Control) Switch

The TOC or reset switch restarts the computer by resetting the operating system.

RS–232C Serial I/O Ports

You can attach a variety of peripheral devices to the two RS–232C Serial I/O (SIO) ports on your workstation. These peripheral devices include printers, plotters, modems, and scanners. Consult the documentation that accompanies each peripheral device for specific information concerning its use.

Both SIO ports are programmable. You can set functions such as bit rate, character length, parity, and stop bits. SIO Ports 1 and 2 are used as interfaces for serial asynchronous devices to the CPU. Both ports operate at up to a 19.2 K baud rate.

Table 1–3 shows the SIO connector pin listings. The serial connectors are 9–pin D–sub connectors. Signal names are those specified in the EIA RS–232 standard.

Table 1–3. 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

HP Parallel I/O Port

The 25–pin HP Parallel I/O port provides an interface for peripheral devices using Centronics interface protocols such as printers and plotters. Consult the documentation that accompanies each peripheral device for specific information concerning its use.

HP–HIL Connector

The HP Human Interface Link (HP–HIL) connector provides an interface for the system keyboard and mouse, and other optional input devices. Consult the documentation that accompanies each input device for specific information concerning its use.

Tone Ext Connector

Use this connector for an external speaker or other audio device. See the earlier section describing audio connectors for a description of the CD–quality audio connectors.

System ac Connector

The system ac connector is located in the power supply. See Figure 1–6.

EISA Card Connector

The EISA card bay is above the power supply and contains four slots for EISA circuit cards. Each EISA card has a faceplate that contains one or more connectors. Four vertical openings allow access to the faceplates of the cards. If your system has no EISA cards, the openings will be covered with blank faceplates. See Figure 1–6.

Graphics Device Connector

You will have one of the following types of graphics devices in your system, depending on your monitor:

- Color graphics card — This device has three BNC connectors; one each for red, blue, and green. These are connected by a cable to three similar connectors on a color monitor. See Figure 1–7.
- Graphics interface card — This device has a connector that is connected to an external graphics processor, which in turn is connected to a video monitor. See Figure 1–8.

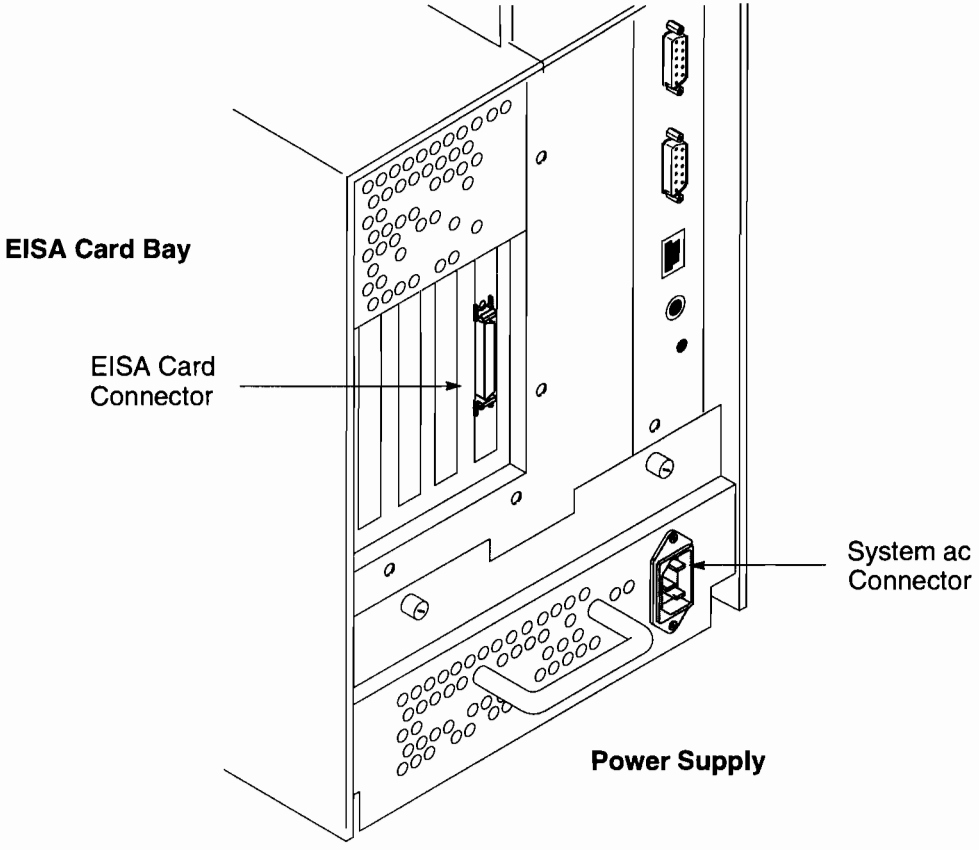


Figure 1–6. System ac Connector and EISA Card Connector

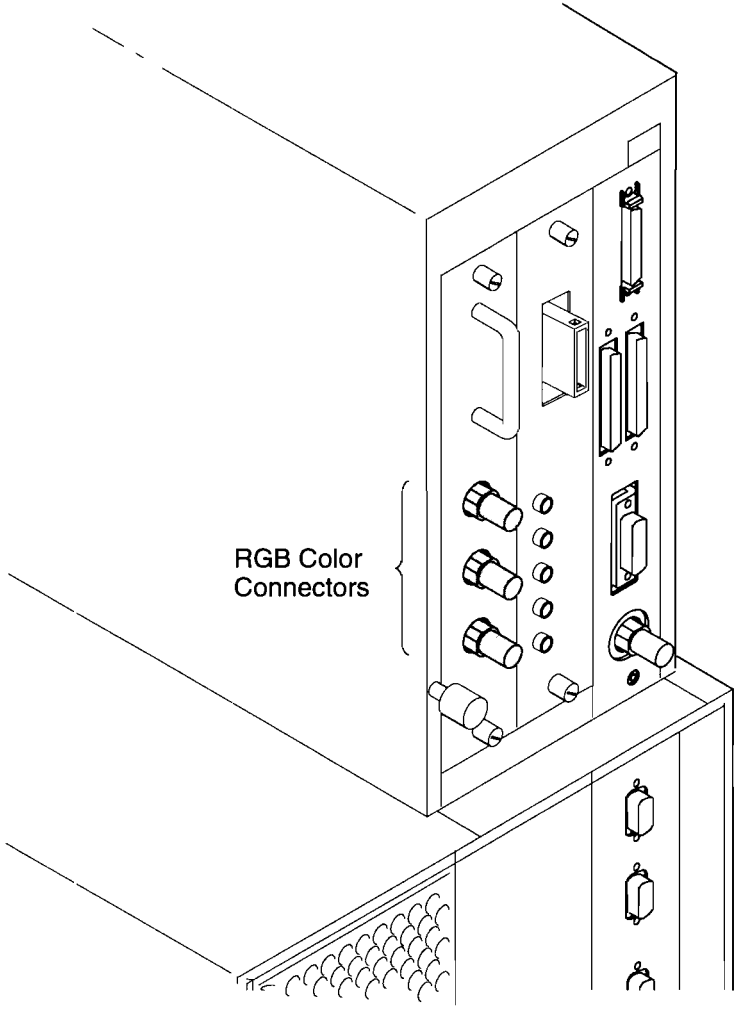


Figure 1–7. Color Graphics Card Connectors

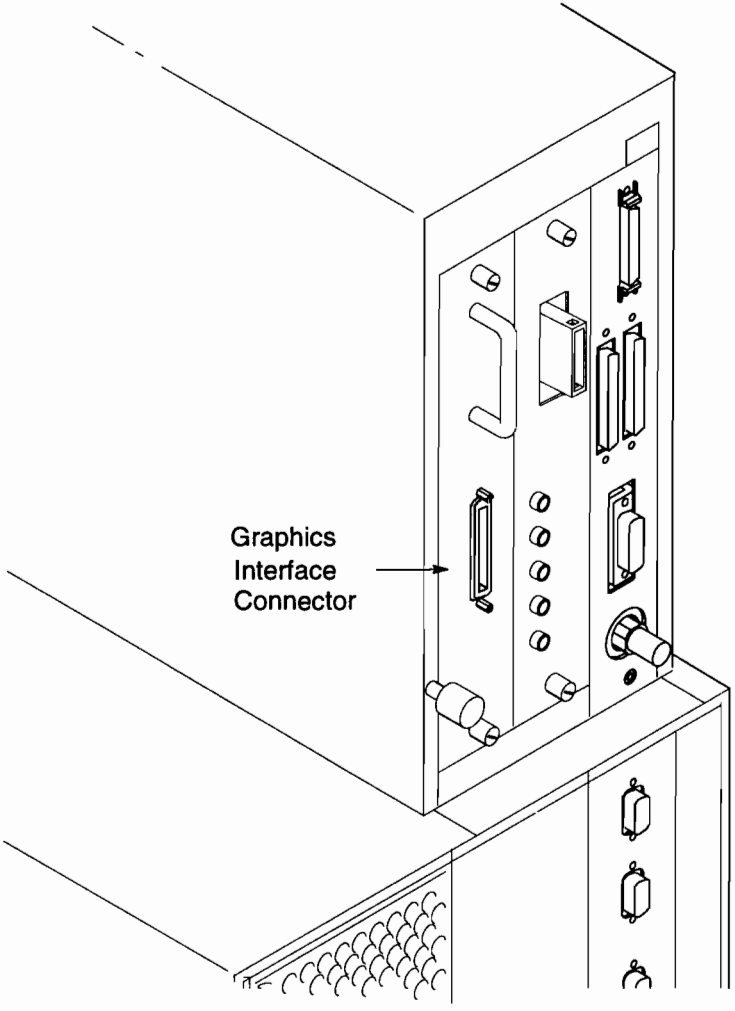


Figure 1–8. Graphics Interface Card Connector

Monitors

To learn about your monitor that came with your workstation, refer to the documentation included with the monitor.

Keyboards

There are two types of Hewlett–Packard keyboards available for use with your workstation. They are the following:

- ITF Keyboard (Also known as the HP 46201A/B Keyboard)
- PC Keyboard (Also known as the PC–101 (HIL) Keyboard, the "Enhanced Vectra" Keyboard, and the C1429A/B Keyboard)

CAUTION: Use only devices that conform to the HP–HIL specification with Hewlett–Packard computer systems. Devices that are not HP–HIL compatible but have similar connectors may appear to be compatible, but will damage your system.

Keyboard Differences

The ITF and PC keyboards differ in three ways: which keys are present, the arrangement of the keys, and the keys' output codes. Some keys on one keyboard (the ITF keyboard for example) may not exist on the other keyboard. These keys generate codes which also may not exist as output from the other keyboard (or may be generated by a different key). Codes that are generated when a key is pressed are called *keycodes*.

Some applications expect to use keycodes generated by keys existing on one of the keyboards (the ITF keyboard for example). Since the keys do not exist on the other keyboard (the PC keyboard for example), an accommodation must be made if the PC keyboard is to be used. In most cases, it is still possible to use some other key that is equivalent (generates the same keycode from a different key). To do this, it is necessary to know which keys are equivalent on the two keyboards. Table 1–4 compares the equivalent keys of the ITF and PC keyboards.

NOTICE: Keyboard keys not mentioned in Table 1–4 are the same on both keyboards.

Table 1–4. PC Keyboard to ITF Keyboard Equivalent Keys

PC Keycap Symbol	ITF Keycap Symbol
F9	blank1 (left)
F10	blank2
F11	blank3
F12	blank4 (right)
PrintScreen / SysReq	**Menu**
Scroll Lock	**Stop**
Pause / Break	**Break / Reset**
Page Up	**Prev**
Num Lock	**System / User**
End	**Select**
Page Down	**Next**
Enter	**Return**
Alt (left)	**Extend Char** (left)
Alt (right)	**Extend Char** (right)
No Equivalent	**Clear Line**
No Equivalent	**Clear Display**
No Equivalent	**Insert Line**
No Equivalent	**Delete Line**
No Equivalent	**Print / Enter**
No Equivalent	, (number pad)
No Equivalent	**Tab** (number pad)

(Continued)

Table 1–4. PC Keyboard to ITF Keyboard Equivalent Keys (cont.)

PC Keycap Symbol	ITF Keycap Symbol
Esc	**Esc / Del**
Insert	**Insert Char**
Home	▶
Delete	**Delete Char**
Caps Lock	**Caps**
Esc Shifted	**Esc / Del** Shifted
Pause / Break Shifted	**Break / Reset** Shifted
Num Lock Shifted	**System / User** Shifted
0 / Ins (number pad)	**0** (number pad)
1 / End (number pad)	**1** (number pad)
2 / ▼ (number pad)	**2** (number pad)
3 / Pg Dn (number pad)	**3** (number pad)
4 / ◀ (number pad)	**4** (number pad)
6 / ▶ (number pad	**6** (number pad)
7 / Home (number pad)	**7** (number pad)
8 / ▲ (number pad)	**8** (number pad)
9 / Pg Up (number pad)	**9** (number pad)
. / Del (number pad)	. (number pad)
Ctrl (left)	**Ctrl**
Ctrl (right)	No Equivalent

Networking Overview

Your Model 755 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. For more information on these capabilities see your system administrator and the *Using HP–UX HP 9000 Workstations* manual that came with your workstation.

mail

You can send and receive mail messages on your workstation. HP VUE uses the *elm* mailer. For more information on mail, read the online man page by entering the following at a command–line prompt:

man mail Return

TELNET

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

man telnet Return

rlogin

The **rlogin** application also allows you to log in to another computer system on the network from your workstation. For more information on **rlogin**, read the online man page by entering the following at a command–line prompt:

man rlogin Return

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 read the online man page by entering the following at a command–line prompt:

man ftp Return

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 online man page by entering the following at a command–line prompt:

man rcp Return

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.

Chapter 2
Getting Started Using HP VUE

This chapter introduces you to your workstation, HP–UX and the Hewlett–Packard Visual User Environment (HP VUE) by explaining the following tasks:

- Starting up your workstation for the first time
- Starting up your workstation
- Logging in to your workstation
- The HP VUE workspace
- Creating a new user account
- Changing your password
- Logging out from your workstation
- Shutting down your workstation

NOTICES: Use this chapter if your workstation is running HP VUE.

If your system does not have HP VUE installed, go to the next chapter entitled "Getting Started Using the HP–UX Command Line Shell."

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

Starting Up Your Workstation for the First Time

This section describes the procedure for starting up your workstation for the first time after the initial hardware installation. If this is not the first time your workstation has been started up, go to the "Starting Up Your Workstation" section later in this chapter.

If your workstation has preloaded software (the HP–UX operating system is loaded on the hard disk at the factory), it is shipped with a yellow sticker covering the system's power switch. Follow the instructions in this section to start up a workstation with preloaded software for the first time after the initial hardware installation.

If your workstation does not have preloaded software and you ordered the HP–UX software separately, refer to the manual *Installing and Updating HP–UX* for instructions.

If your system does not have a hard disk installed, or if it has a hard disk installed and you want your workstation to be a cluster client node (cnode), refer to the *Managing Clusters of HP 9000 Computers: Sharing the HP–UX File System* manual for instructions on setting up clusters and cnodes.

When you turn on your workstation for the first time, you are asked for some information about your system. If you do not have the information, you may press the Return key. HP–UX uses its default value for that question.

Before you start, you should know the following information:

- The *system name* of your computer. (This is sometimes called the *host name*.) The system name cannot exceed eight characters in length. Obtain a system name from your system administrator.
- If you are connecting your system to a local area network, you also need to know the *Internet Protocol address* (*IP address*) of your computer. This is a four–element code that uniquely identifies your computer among all those located on your network (or any other network). Obtain this address from your system administrator.
- The *time zone* where your computer is located.

Use the following instructions to start up your workstation:

1. Push in the power switch on the monitor. The power LED lights up to indicate that the power is on.

2. Turn on the power to any external peripherals.

3. Push in the power switch on your workstation. The power LED lights up to indicate that the power is on.

4. You are prompted for information about your workstation. Enter this information as it is requested. If you do not have the information when prompted for it, press the Return key:

   You can provide the information later by executing the following command from a terminal window:

   /etc/set_parms Return

   The system will also ask if you want to set a root password. You should set a password for the root account at this time. If you choose not to select a root password, you may do so later as described in the "Changing Your Password" section later in this chapter.

   When you have finished answering the questions, the system finishes its boot sequence and the login window opens. See the section entitled "Logging In to Your Workstation" later in this chapter for instructions on logging in.

Starting Up Your Workstation

This section describes the procedure for starting up your workstation. If this is the first time that your workstation has been started up since the initial hardware installation, go to the "Starting Up Your Workstation for the First Time" section earlier in this chapter.

Use the following instructions to start up your workstation:

1. Push in the power switch on the monitor. The power LED lights up to indicate that the power is on.

2. Turn on the power to any external peripherals.

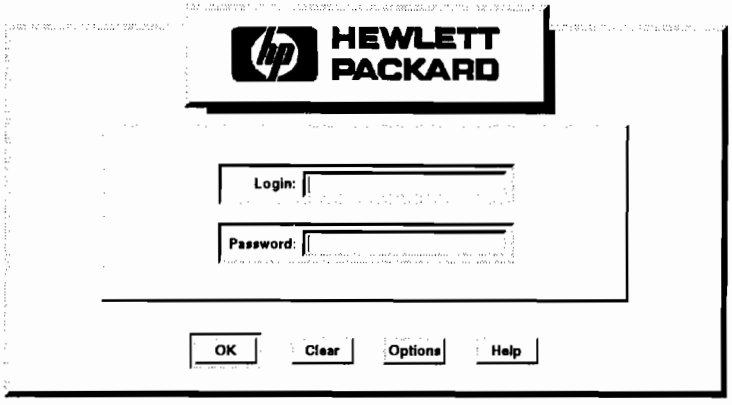
3. Push in the power switch on your workstation. The power LED lights up to indicate that the power is on.

   After two or three minutes, many messages appear on your screen. These messages convey information about the various hardware and software subsystems that are being activated by the boot process. Unless something is wrong with your system, you are not asked to respond to any of these messages.

   The login window opens. See the next section entitled "Logging In to Your Workstation" for instructions on logging in.

Logging In to Your Workstation

After your workstation has successfully booted HP–UX and started HP VUE, the following **Login** window opens:



If this window does not appear, see Chapter 6, "Solving Problems."

1. The first time you log in, you must log in as **root**. To log in as **root**, type the following in the **Login:** box:

   root Return

   If this is not the first time you have logged in, type your username in the **Login:** box.

   If you don't have a username yet, ask your system administrator to assign you a personal username account or follow the instructions in the section entitled "Creating a New User Account," later in this chapter. Until you get a username account, you may log in as **root**.

2. If a password has been set for **root**, or if you are logging in with your own username, you must enter the correct password in the **Password:** box at this time. The password is secret and does not appear on the screen.

If the copyright notice appears on your screen followed by the HP VUE workspace, you are now logged in. Skip Step 3.

If a window opens over your login window cautioning you about your workstation's hostname being **unknown**, start HP VUE as described in Step 3.

3. If the following window opened over your login window:

Move your mouse pointer to [Start HP VUE] and click the left mouse button.

NOTICE: If your system's hostname is unknown, at some later time you should run the program **/etc/set_parms** or contact your system administrator to set a hostname.

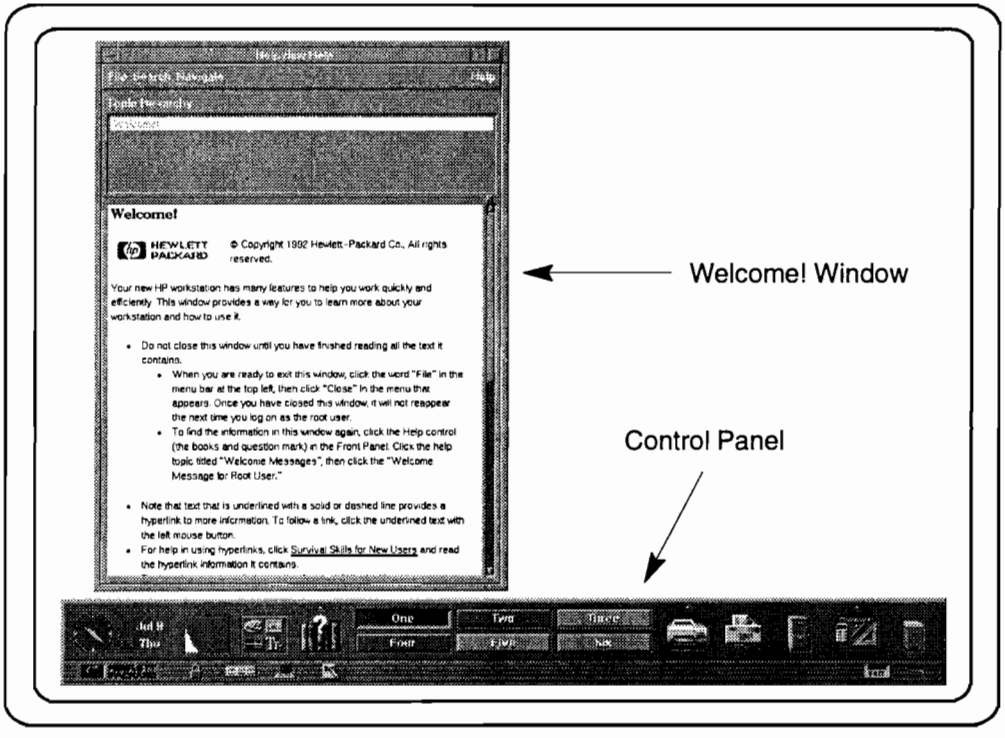
The copyright notice appears on your screen followed by the HP VUE workspace. You are now logged in.

The HP VUE Workspace

This section gives an overview of the HP VUE environment. For more information on using HP VUE, refer to the *HP Visual User Environment User's Guide.*

After you log in, an HP VUE workspace, similar to the following, opens. There is a **Welcome!** window and the **control panel**.

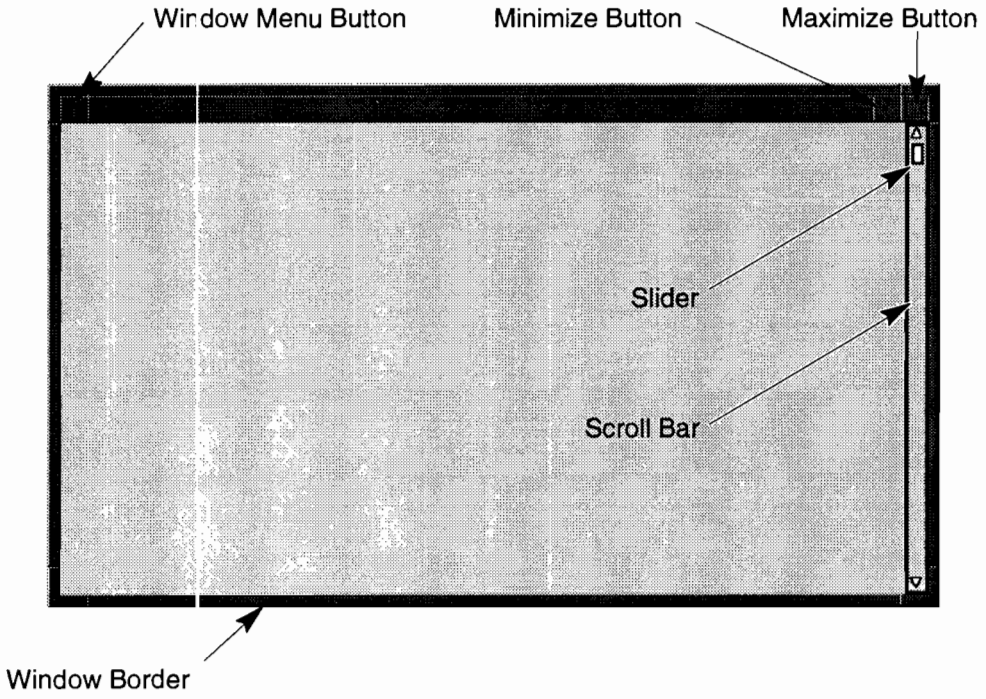
NOTICE: Your initial HP VUE workspace may look slightly different from the one shown.



Understanding HP VUE Windows

This subsection describes some features of windows in the HP VUE environment.

All windows in HP VUE have some characteristics in common. All windows have a **Window Menu Button**, a **Minimize Button**, a **Maximize Button**, and a **Window Border**. Some windows may also have a **scroll bar** on the side or along the bottom. The following illustration shows where each of these window features is located.



Window Menu Button — The **Window Menu Button** creates a menu list from which you can choose a window control action. If you move the mouse pointer to the **Window Menu Button** and press and release the left mouse button once (*single–click*), a **Window Menu** opens with a list of choices. To select a choice from the menu, move the mouse pointer to the desired menu selection and single–click the left mouse button. To close the **Window Menu** without making a selection, move the mouse pointer outside of the window and single–click the left mouse button.

Minimize Button — The **Minimize Button** changes a window into an **icon**. (An **icon** is a small picture.) When you minimize a window, whatever process is running in that window keeps running, even though you can't see its progress.

To minimize a window, move the mouse pointer to the window's minimize button and single–click the left mouse button. The window closes and a small icon opens on your HP VUE workspace. To get the window back from an icon, place the mouse pointer on the icon, then quickly press and release the left mouse button twice. (This is called *double–clicking*.) The icon closes and the window reopens.

Maximize Button — The **Maximize Button** changes the size of the window so that it fills the entire workspace. To maximize a window, move the mouse pointer to the window's maximize button and single–click the left mouse button. The window grows. Single–clicking on the maximize button again restores the window to its original size.

Window Border — The **Window Border** has two purposes: to size the window and indicate whether or not the window is the active window.

- To **size a window**, move the mouse pointer to a spot on the window border. The mouse pointer changes to an arrow that points either up, down, left, right or in one of the four possible diagonal directions, depending upon where on the window border the mouse pointer is placed. Press and hold the left mouse button. Move the mouse in the direction of the arrow. An outline appears. Move the mouse until the outline is the appropriate size. Release the mouse button and the window grows or shrinks to the selected size.
- In the HP VUE environment, one window is always the **active window**. The active window is the one which is receiving input from the keyboard at the present time. When a window is the **active window**, it has a different border color than the other windows on the display.

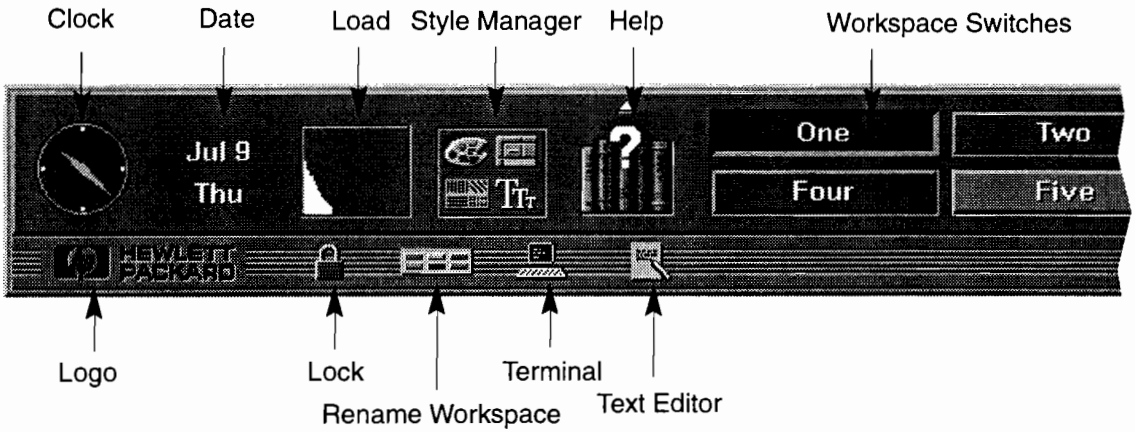
  To make a window the **active window**, place the mouse pointer anywhere inside of the window and single–click the left mouse button.

Scroll Bar — A **scroll bar** appears on a window that contains more information than will fit in the window. If there is a vertical scroll bar on the right side of a window, there is more information either above or below the information that is currently displayed in the window. If there is a horizontal scroll bar along the bottom of the window, there is more information either to the left or the right of the information that is currently displayed in the window.

Use the **scroll bar** to view the rest of the window's information by moving the mouse cursor to the **scroll bar slider**. Press and hold the left mouse button and move the mouse until more information scrolls into the window. When the information you wish to view is visible, release the left mouse button.

Understanding the HP VUE Control Panel

This section describes the HP VUE **control panel** buttons and their features.



Clock — The **clock** display shows the current workstation time.

Date — The **date** display shows the current workstation date.

Load — The **load** display shows workstation activity. This is actually an application displaying a window in the **control panel**.

Style Manager — The **style manager** button starts up the **style manager** which allows you to change your display's appearance, and allows you to change the system device behavior (the speed necessary to double–click your mouse, for example).

Help — The **help** control starts up the **help manager** which provides online help.

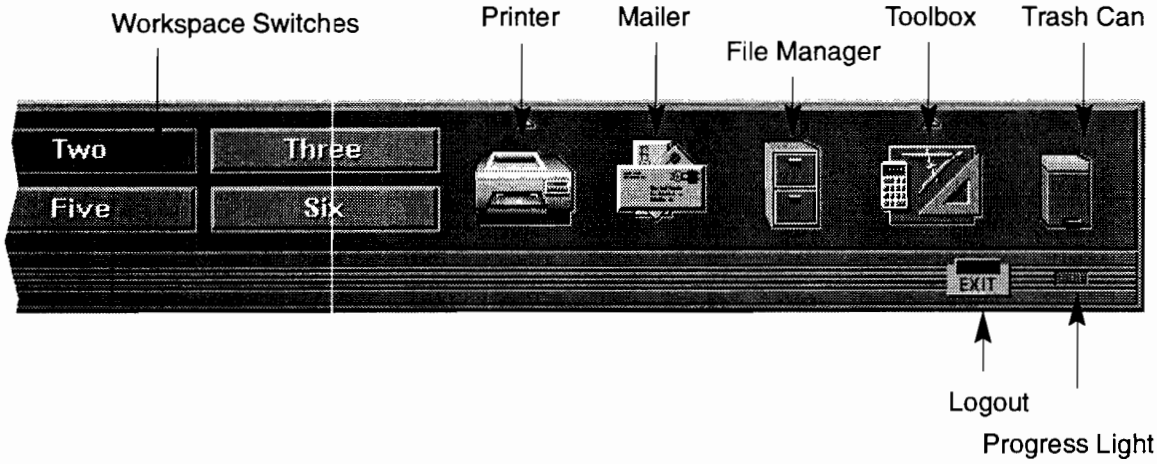
Logo — The **logo** control allows you to see HP VUE version information.

Lock — The **lock** control allows you to lock your workstation, preventing unauthorized input.

Rename Workspace — The **rename workspace** button displays a dialog box that allows you to rename a workspace.

Terminal — The **terminal** control starts up a terminal window, providing access to a command–line prompt.

Text Editor — The **text editor** control starts up the **text editor**. This button is also a drop zone that accepts a file icon dragged from a file manager window.



Workspace Switches — The **workspace switches** allow you to select another workspace.

Printer — The **printer** control allows you to display printer job status on the system default printer. This button is also a drop zone that accepts a file icon. The **printer** sub panel can be configured for printers other than the default.

Mailer — The **mailer** control starts up your electronic mail application. This button is also a drop zone that accepts a file icon.

File Manager — The **file manager** control starts up a **file manager** window showing your home directory.

Toolbox — The **toolbox** control opens your **personal toolbox**. The **toolbox** sub panel opens other toolboxes that contain actions and utilities.

Trash Can — The **trash can** control allows you to display the contents of the trash can. This button is also a drop zone that accepts a file icon.

Logout — Clicking on the **logout** control begins the logout process.

Progress Light — The **progress light** blinks to indicate an activity in progress, such as a new window opening.

Using the HP VUE Workspace

This subsection describes how to perform a few basic tasks in the HP VUE Workspace.

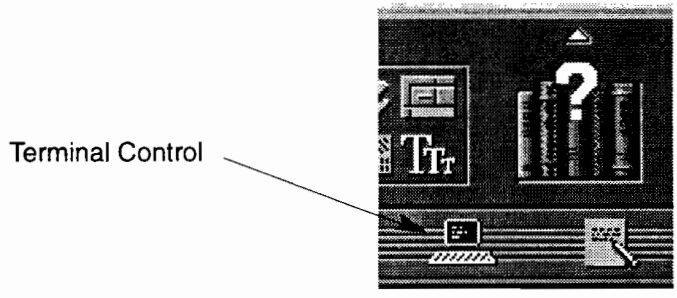
1. Read and explore the information in the **Welcome!** window, then continue with Step 2 below.

2. Close the **Welcome!** window by placing the mouse cursor on the window's **menu button** and double–clicking the left mouse button.

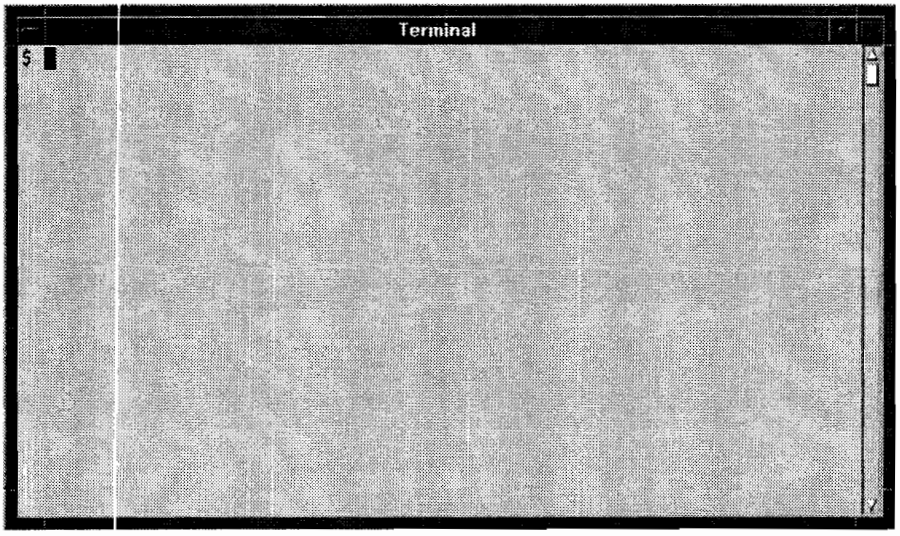
3. **Terminal windows** are like user terminals connected to your system. Enter keyboard commands to execute programs and control your workstation in a **terminal window**.

   Always use a terminal window to enter commands from the keyboard. You may have several terminal windows open at the same time and execute commands in each terminal window separately.

   To create a terminal window, move the mouse pointer to the **terminal control**. (The **terminal control** is the icon on the control panel that looks like a computer terminal, as shown in the following illustration.) Click the left mouse button once. A terminal window opens.



4. Place the mouse pointer anywhere in the new terminal window and single–click the left mouse button to make it the active window. The border of the window changes color to indicate that it is now the active window. Enter your commands from the keyboard.



5. To display the revision level of HP–UX your system is running, enter the following in your terminal window:

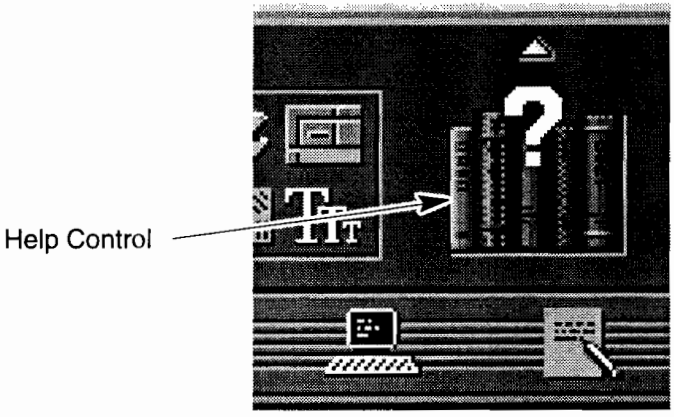
uname –r Return

6. Close the terminal window by double–clicking its window menu button.

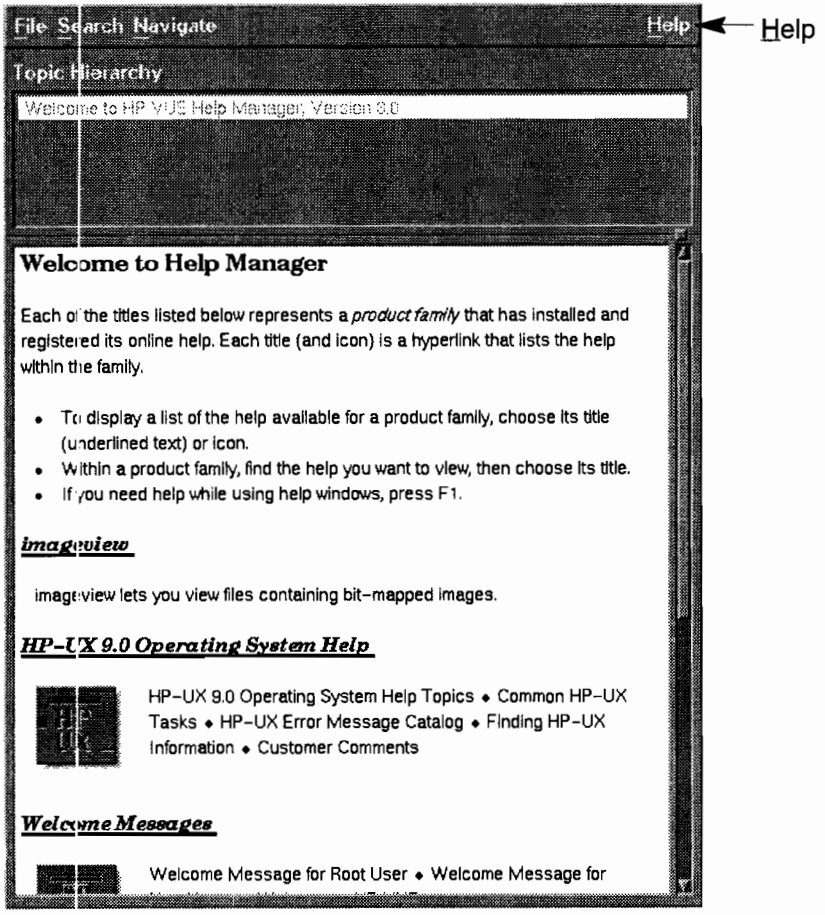
Using the HP VUE Online Help

This subsection describes how to get to the help system.

1. Move the pointer to the **help control**, which is the icon on the control panel with a question mark (**?**). Single–click the left mouse button once.



2. The **Help** window opens. Click on **Help** in the upper right hand corner of the window for help on using the help system.



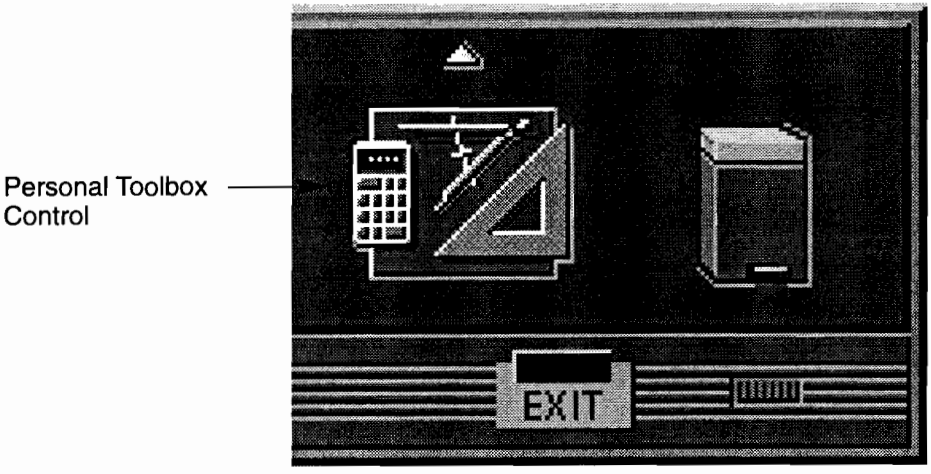
3. To close the help window, place the mouse cursor on its window menu button and double–click the left mouse button. The window closes.

Creating a New User Account

A new user account is created with a system utility called SAM (System Administration Manager). Follow the instructions in this section to create a new user account.

1. Log in as **root.**

2. Move the mouse pointer to the **personal toolbox control**, shown below, and single–click the left mouse button.



3. The **PersonalToolbox** window opens. Move your mouse pointer onto the **Sam** icon shown below and double–click the left mouse button.

4. The initial **SAM** window opens. Double–click on the line labeled **Users and Groups –>**

5. The **Users and Groups** window opens. Double–click on the line labeled **Users**

6. The **Users** window opens. At the top of the window is a list. Single–click on **Actions**

7. A menu opens below the word **Actions**. Single–click on **Add...**

8. A window opens. Single–click on the box labeled **Login Name:** Then type the name for the new user account and press Return

9. Single–click on OK

10. A password window opens. Single–click the box labeled **Password:**, then type the login password for the new user account and press Return

NOTICE: A password must contain at least six characters. One of those characters must be a number, a dash (–), or an underline (_).

CAUTION: Make sure you do not forget the password you use. If you forget a user account password, log in as **root** and set a new password with the SAM utility or contact your system administrator.

11. Single–click on OK

12. You are requested to re–enter the password. Single–click the box labeled **Password:**, then re–enter the password **exactly** as you entered it the first time.

13. Single–click on [OK]

14. In a few moments a window opens with the following message:

```
Task Completed
```

Single–click on [OK]

15. At the top of the window is a list. Single–click on **List**

16. A menu opens below the word **List**. Single–click on **Exit**

The main **SAM** window becomes visible again.

17. In the main **SAM** window, single–click on [Exit SAM]

The **SAM** window closes.

18. Double–click the window menu button in the upper left corner of the **PersonalToolbox** window. The window closes.

Changing Your Password

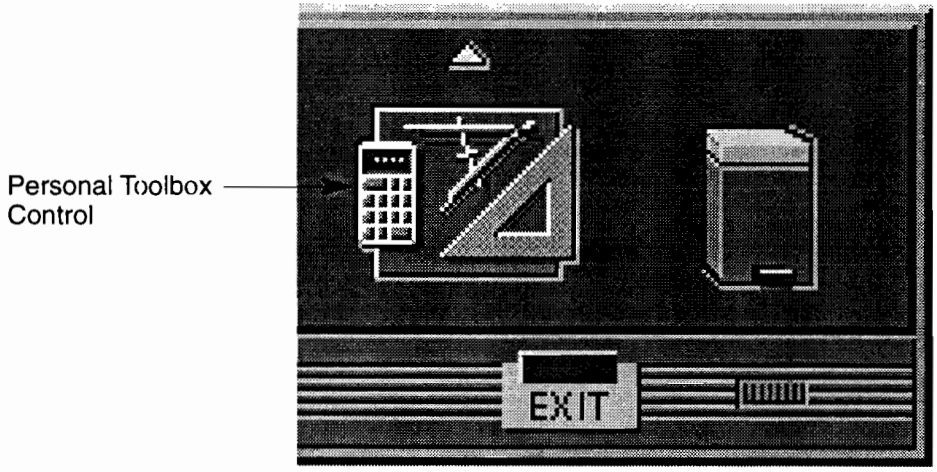
This section describes how to change your password from HP VUE.

NOTICE: When you log in for the first time, you should add a password for the **root** account to ensure system security.

CAUTION: If you are changing the password for **root**, make sure you do not forget the password you use. If you forget the password for **root**, you cannot log in as **root**; therefore you cannot set a new password for **root**.

1. Log in as the user whose password you want to change.

2. Move the mouse pointer to the **personal toolbox control**, shown below, and single–click the left mouse button.



3. The **PersonalToolbox** window appears. Move your mouse pointer onto the **ChangePassword** icon shown below and double–click the left mouse button.

4. A window opens. Enter the password information when prompted.

NOTICE: A password must contain at least six characters. One of those characters must be a number, a dash (–), or an underline (_).

The process completes and the window closes.

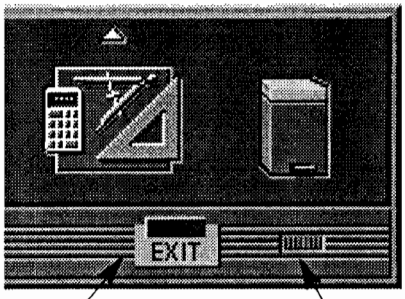
5. Double–click the window menu button in the upper left corner of the **PersonalToolbox** window. The window closes.

Logging Out from Your Workstation

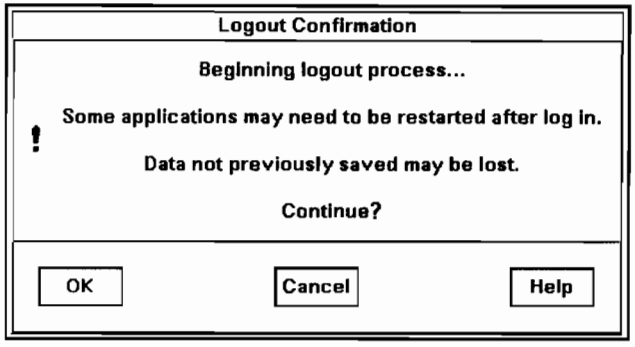
Follow the instructions in this section to log out of your workstation through HP VUE.

1. To log out, mcve your pointer onto the **EXIT** icon on the control panel. This icon is called the **logout control**. Single–click the left mouse button.

Notice that the **progress light** beside the **logout control** begins to blink. This indicates that the logout process has begun.



2. The following confirmation box opens:



To confirm your logout, click on OK

A short time later, the login window reopens.

CAUTION: After you log out, **do not** turn off the power to your workstation. You must first perform the shutdown procedure described later in this chapter. If you do not shut down your workstation properly, you may damage the programs and data on your disk.

Shutting Down Your Workstation

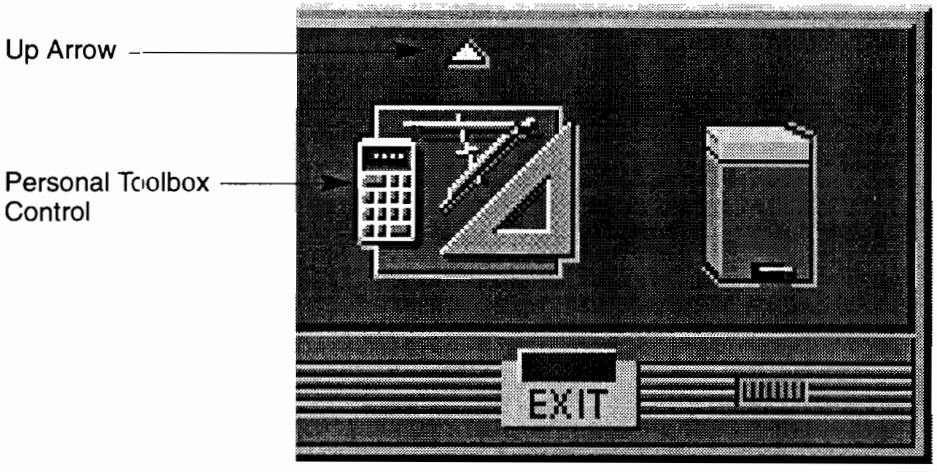
This section describes how to shut down your workstation using HP VUE.

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

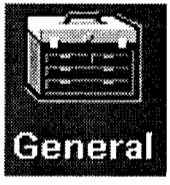
When you need to shut down HP–UX so that your workstation can be powered off, follow these steps. Doing this ensures that your file system remains intact and that you can power up and log in correctly.

1. Log in as **root**.

2. Move the mouse pointer to the **up arrow** above the **personal toolbox control**, shown below, and click the left mouse button once.



3. The **Toolboxes** subpanel opens. Place the mouse cursor on the **General** toolbox icon, shown below, and single–click the left mouse button.



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

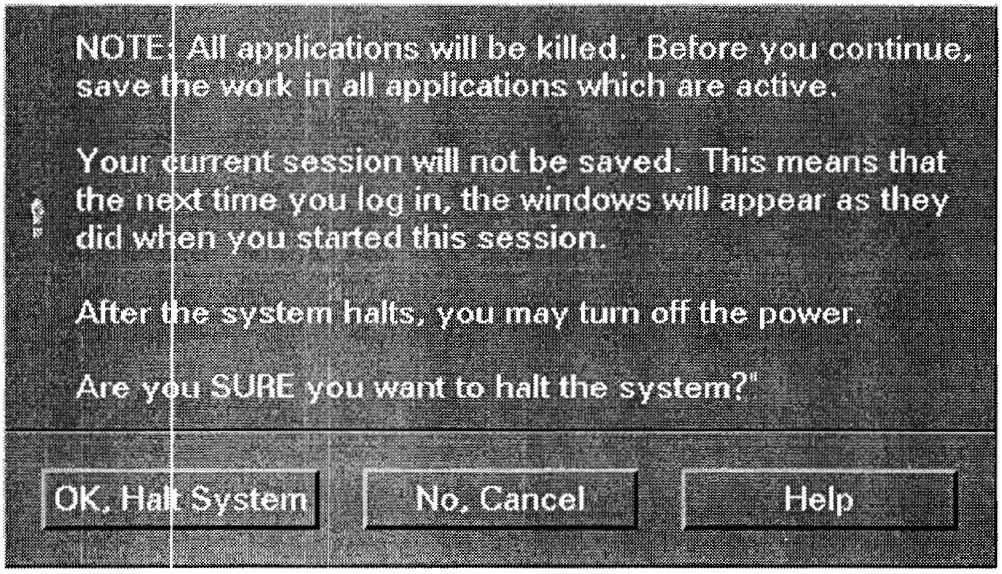
5. The **System_Admin** window appears. Move the mouse cursor onto the scroll bar slider at the side of the window. Press and hold the left mouse button while moving the mouse toward you. When the **HaltSystem** icon shown below appears, release the left mouse button.

6. Double–click on the **HaltSystem** icon.

7. When the window shown below opens, click on OK. Halt System

NOTICE: The message displayed in your **Halt System** window may be different than shown. This does not affect the shutdown procedure.

Any other users who are logged onto your workstation get a warning that the workstation is soon to be unavailable. One minute later, the system begins its shutdown process.



NOTICE: When the **Halt System** window opens, if you do not want to shut down your system, click on No, Cancel

8. The shutdown process takes about one minute.

The following message appears in the lower left–hand corner of your screen:

```
Halted, you may now cycle power.
```

When the message appears, push the power switch on the front of the system to turn off your workstation, then push it again to restart your workstation.

Creating a Recovery System Tape and Backing Up Your Files

If you have a tape drive attached to your workstation, you should make a recovery system tape and make periodic backups of your personal files.

For information on creating a recovery system tape and backing up files, see the manual *Using HP–UX HP 9000 Workstations* that came with your workstation.

For More Information

To learn more about HP VUE and HP–UX, refer to the manual *HP Visual User Environment User's Guide* and *Using HP–UX HP 9000 Workstations* that came with your workstation.

Chapter 3
Getting Started Using the HP–UX Command Line Shell

This chapter introduces you to your workstation, HP–UX, and the Hewlett–Packard Command–Line Environment by explaining the following tasks:

- Starting up your workstation for the first time
- Starting up your workstation
- Logging in to your workstation
- Creating a new user account
- Changing your password
- Logging out from your workstation
- Shutting down your workstation

NOTICES: Use this chapter if your workstation does not have HP VUE installed.

If your system is running HP VUE, go to the previous chapter entitled "Getting Started Using HP VUE."

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

Starting Up Your Workstation for the First Time

This section describes the procedure for starting up your workstation for the first time after the initial hardware installation. If this is not the first time your workstation has been started up, go to the "Starting Up Your Workstation" section later in this chapter.

If your workstation has preloaded software (the HP–UX operating system is loaded on the hard disk at the factory), it is shipped with a yellow sticker covering the system's power switch. Follow the instructions in this section to start up a workstation with preloaded software for the first time after the initial hardware installation.

If your workstation does not have preloaded software and you ordered the HP–UX software separately, refer to the manual *Installing and Updating HP–UX* for instructions.

If your system does not have a hard disk installed, or if it has a hard disk installed and you want your workstation to be a cluster client node (cnode), refer to the *Managing Clusters of HP 9000 Computers: Sharing the HP–UX File System* manual for instructions on setting up clusters and cnodes.

When you turn on your workstation for the first time, you are asked for some information about your system. If you do not have the information, you may press the Return key: HP–UX uses its default value for that question.

Before you start, you should know the following information:

- The *system name* of your computer. (This is sometimes called the *host name*.) The system name cannot exceed eight characters in length. Obtain a system name from your system administrator.
- If you are connecting your system to a local area network, you also need to know the *Internet Protocol address* (*IP address*) of your computer. This is a four–element code that uniquely identifies your computer among all those located on your network (or any other network). Obtain this address from your system administrator.
- The *time zone* where your computer is located.

Use the following instructions to start up your workstation:

1. Push in the power switch on the monitor. The power LED lights up to indicate that the power is on.

2. Turn on the power to any external peripherals.

3. Push in the power switch on your workstation. The power LED lights up to indicate that the power is on.

4. You are prompted for information about your workstation. Enter this information as it is requested. If you do not have the information when prompted for it, press the Return key:

   You can provide the information later by executing the following command:

   /etc/set_parms Return

   The system will also ask if you want to set a root password. You should set a password for the root account at this time. If you choose not to select a root password, you may do so later as described in the "Changing Your Password" section later in this chapter.

   When you have finished answering the questions, the system finishes its boot sequence and the login prompt appears at the bottom of your screen. See the section entitled "Logging In to Your Workstation" for instructions on logging in. If the HP VUE login window appears in the center of your screen, follow the instructions in Chapter 2, "Getting Started Using HP VUE."

Starting Up Your Workstation

This section describes the procedure for starting up your workstation. If this is the first time that your workstation has been started up since the initial hardware installation, go to the "Starting Up Your Workstation for the First Time" section earlier in this chapter.

Use the following instructions to start up your workstation:

1. Push in the power switch on the monitor. The power LED lights up to indicate that the power is on.

2. Turn on the power to any external peripherals.

3. Push in the power switch on your workstation. The power LED lights up to indicate that the power is on.

   After two or three minutes, many messages appear on your screen. These messages convey information about the various hardware and software subsystems that are being activated by the boot process. Unless something is wrong with your system, you are not asked to respond to any of these messages.

   The login prompt appears at the bottom of your screen. See the next section entitled "Logging In to Your Workstation" for instructions on logging in. If the HP VUE login window appears in the center of your screen, follow the instructions in Chapter 2, "Getting Started Using HP VUE."

Logging In to Your Workstation

Follow the instructions in this section to log in if your workstation does not have HP VUE installed, or if you selected **No Windows** or **Fail–Safe** from the options menu of the HP VUE login window.

1. The first time you log in, you must log in as **root**. To log in as **root**, type the following at the **Login:** prompt:

   root Return

   If this is not the first time you have logged in, type your username at the **Login:** prompt.

   If you don't have a username yet, ask your system administrator to assign you a personal user account or follow the instructions in the section entitled "Creating a New User Account," later in this chapter. Until you get a user account, you may log in as **root**.

2. If a password has been set for **root**, or if you are logging in with your own username, you must enter the correct password at the **Password:** prompt at this time. The password is secret and does not appear on the screen.

   The copyright notice appears briefly, followed by this line:

   ```
   Is your console one of the following: a 2392A, 2393A,
   2397A or 700/92? [y/n]:
   ```

3. Enter the following:

y Return

The following lines then appear:

```
Value of TERM has been set to "hp".
#
```

If you have logged in as **root**, the following lines appear:

```
Value of TERM has been set to "hp".
WARNING: YOU ARE SUPERUSER !!
#
```

You are now logged in.

Creating a New User Account

A new user account is created with a system utility called SAM (System Administration Manager). Follow the instructions in this section to create a new user account.

1. Log in as **root.**

2. Enter the following:

   sam Return

3. The initial **SAM** window opens. Use the arrow keys on your keyboard to select the line labeled **Users and Groups –>**

   Press Return

4. The **Users and Groups** window opens. Use the arrow keys to select **Users**

   Press Return

5. The **Users** window opens. At the top of the window is a list. Press F4 to activate the list.

6. Use the arrow keys to select **Actions**

   Press Return

7. A menu opens below the word **Actions**. Use the arrow keys to select **Add...**

Press Return

8. A window opens. Enter a name for the new user account. Then press Return

9. Press F5

10. A password window opens. Type the login password for the new user account. Then press Return

NOTICE: A password must contain at least six characters. One of those characters must be a number, a dash (–), or an underline (_).

CAUTION: Make sure you do not forget the password you use. If you forget a user account password, log in as **root** and set a new password with the SAM utility or contact your system administrator.

Press Tab once.

Then press Return

11. You are requested to re–enter the password. Re–enter the password **exactly** as you entered it the first time. Then press Tab once.

Press Return

12. In a few moments a window opens with the following message:

```
Task Completed
```

Press Return

13. At the top of the window is a list. Press F4 to activate the list.

14. Use the arrow keys on your keyboard to select **List**

Then press Return

15. A menu opens below the word **List**. Use the arrow keys to select **Exit**

Then press Return

The main **SAM** window becomes visible again.

16. Press Tab until **Exit SAM** is selected.

Then press Return

The SAM utility closes and the command line prompt appears.

Changing Your Password

This section describes how to change your password from an HP–UX command line.

NOTICE: When you log in for the first time, you should add a password for the **root** account to ensure system security.

CAUTION: If you are changing the password for **root**, make sure you do not forget the password you use. If you forget the password for **root**, you cannot log in as **root**; therefore you cannot set a new password for **root**.

1. Log in as the user whose password you want to change.

2. Enter the following:

   passwd Return

3. A window opens. Enter the password information when prompted.

NOTICE: A password must contain at least six characters. One of those characters must be a number, a dash (–), or an underline (_).

The process completes and the window closes.

Logging Out from Your Workstation

Follow the instructions in this section to log out from your workstation using an HP–UX command line.

Enter the following at the shell prompt:

exit Return

The system closes your login session and in a few moments responds with the login prompt.

CAUTION: After you log out, **do not** turn off the power to your workstation. You must first perform the shutdown procedure described later in this chapter. If you do not shut down your workstation properly, you may damage the programs and data on your disk.

Shutting Down Your Workstation

This section describes how to shut down your workstation using an HP–UX command line.

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

When you need to shut down HP–UX so that your workstation can be powered off, follow these steps. Doing this ensures that your file system remains intact and that you can power up and log in correctly.

1. Log in as **root**.

2. Set your working directory to the root (/) directory by entering the following on the command line:

   cd / Return

3. Execute the following shutdown command:

   /etc/shutdown –h 0 Return

   Any other users who are logged onto your workstation get a warning that the workstation is soon to be unavailable. One minute later, the system begins its shutdown process.

4. The shutdown process takes about one minute. When it is complete the following message appears in the lower left–hand corner of your screen:

```
Halted, you may now cycle power.
```

When the message appears, push the power switch on the front of the system unit to turn off your workstation, and then push it again to restart your workstation.

Creating a Recovery System Tape and Backing Up Your Files

If you have a tape drive attached to your workstation, you should make a recovery system tape and make periodic backups of your personal files.

For information on creating a recovery system tape and backing up files, see the manual *Using HP–UX HP 9000 Workstations* that came with your workstation.

For More Information

To learn more about HP–UX, refer to the manual *Using HP–UX HP 9000 Workstations* that came with your workstation.

Chapter 4
Setting Up Your Printer

This chapter describes how to configure your workstation to use a printer that you have physically attached to either the parallel connector or one of the serial (RS–232) connectors on the rear of your system by explaining the following tasks:

- Gathering printer information
- Setting up a printer attached to your workstation
- Setting up a printer for network printing
- Printing a file
- Solving printing problems

NOTICES: Before following the instructions in this chapter make sure you have installed the printer as described in the manufacturer's instructions. Also ensure that the printer is powered on, connected to your workstation, has paper loaded, and is online.

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

Gathering Printer Information

Fill in the following list with the requested information and refer to it during the printer setup procedure:

- Printer Interface (check one): Parallel ☐
  Serial (RS232) Port 1 ☐
  Serial (RS232) Port 2 ☐
- Printer Name: _____
  (The printer name is a name the system uses to identify the printer. The printer name can be any name that you wish.)
- Printer Model Number: _____
  (On Hewlett Packard printers the model number is located on a label on the back of the printer.)

Setting Up a Printer Attached to Your Workstation

Follow the instructions in this section to set up a printer that is physically attached to your workstation.

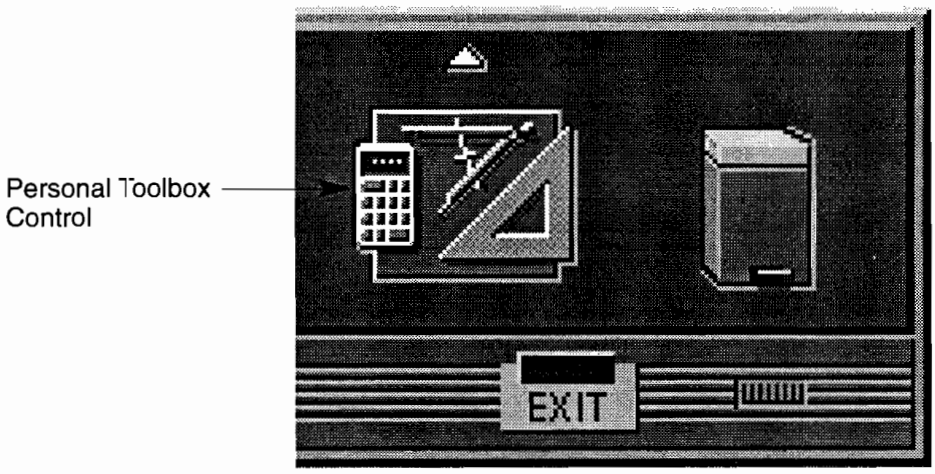
The procedures in this chapter require you to log in as **root**. If you cannot log in as **root**, contact your system administrator.

Setting Up a Printer with HP VUE

If you are using HP VUE, follow these instructions to set up your printer. If your system does not have HP VUE installed, go to the next subsection entitled "Setting Up a Printer From the HP–UX Command Line Shell" for instructions on setting up a printer.

1. Log in as **root.**

2. Move the mouse pointer to the **personal toolbox** control, shown below, and single–click the left mouse button.



3. The **PersonalToolbox** window opens. Move the mouse cursor onto the **Sam** icon shown below and double–click the left mouse button.

4. The initial **SAM** window opens. Double–click on the line labeled **Printers and Plotters ->**

5. Another screen opens. Double–click on the line labeled **Printers/Plotters**

If your workstation doesn't have any printers set up, a message window opens. Single–click on [OK] to remove the message window.

6. Move the cursor to the word **Actions** at the top of the **Printers/Plotters** window and single–click the left mouse button.

7. A menu opens below the word **Actions**. Single–click on **Add Local Printer/Plotter**

8. Another menu opens. If your printer is connected to the parallel port on your workstation, single–click on **Add Parallel Printer/Plotter**

If your printer is connected to one of the serial connectors on your workstation, single–click on **Add Serial (RS–232) Printer/Plotter**

A window opens and displays the available parallel or serial interfaces.

9. If you chose **Add Parallel Printer/Plotter** in the previous step, only one parallel interface should be listed. Place the mouse cursor on the listed parallel interface and single–click the left mouse button.

If you chose **Add Serial (RS–232) Printer/Plotter** in the previous step, more than one serial interface could be listed. The serial interfaces are listed in ascending order. The lowest numbered serial interface corresponds to the lowest numbered serial connector on your workstation. Choose the serial interface that corresponds to the connector to which you have connected your printer. Place the mouse cursor on the selected serial interface and single–click the left mouse button.

10. Single–click on [OK]

11. A window opens. Single–click on the box labeled **Printer Name**
Then enter a name for the system to use for the printer and press [Return]

12. Single–click on [Printer/Model Interface]

13. A window opens. Move the mouse cursor onto the scroll bar slider at the side of the new window. Press and hold the left mouse button while moving the mouse. When the model name of your printer appears, release the left mouse button.

14. Move the mouse cursor to your printer's model name and single–click the left mouse button.

15. Single–click on [OK]

The window closes and the **Add Local Printer/Plotter** window becomes visible again.

16. If you want your printer to be set as the system default printer, move the mouse cursor to the small box labeled **Make this the system default printer** and single–click the left mouse button.

17. Single–click on [OK]

18. A small window opens with a message that asks if you want to add your printer to the "Printers" subpanel. Single–click on [Yes]

19. Another small window opens with a message that asks if you want to restart the workspace manager. Single–click on [OK]

20. If the print spooler was not previously running, a window will open with the following question:

```
Do you want to start the print spooler now?
```

21. Single–click on [Yes]

22. A window appears asking if your printer is powered on, has paper, is connected to your workstation, and is online. Check your printer to make sure it meets these requirements.

Single–click on [OK]

23. Single–click on [OK] at the bottom of the **Messages** window.

The **Printer/Plotter Manager** window now lists your printer.

24. Move the cursor to the word **List** at the top of the **Printer/Plotter Manager** window and single–click the left mouse button:

25. A menu opens below the word **List.** Single–click on **Exit**

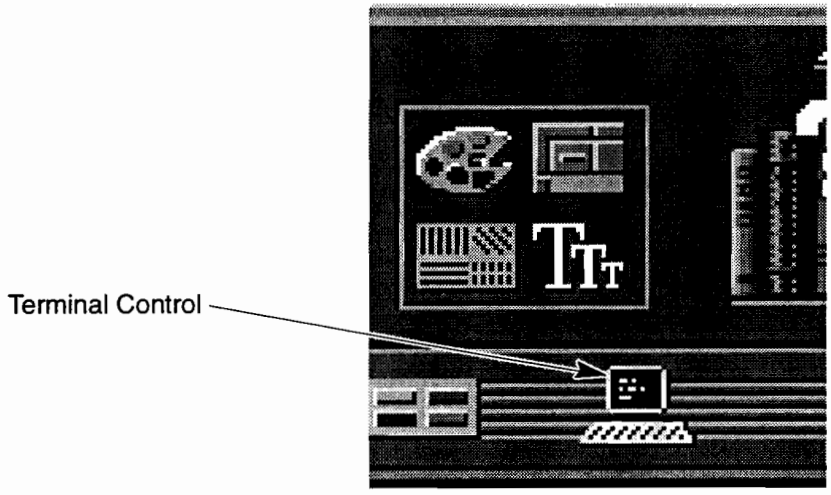
The main **SAM** window becomes visible again.

26. In the main **SAM** window, single–click on [Exit SAM]

The **SAM** window closes.

27. Double–click the window menu button in the upper left corner of the **PersonalToolbox** window. The window closes.

28. To test the printer, first create a terminal window by single–clicking the **terminal control** on the **control panel** as shown.



A terminal window opens.

29. Move the mouse cursor into the terminal window and single–click the left mouse button.

30. If you made your printer the default system printer, enter the following command to test your printer:

lp .profile Return

If your printer isn't the default system printer, enter the following command to test your printer:

lp –d *printername* **.profile** Return

Where *printername* is the name you chose when setting up your printer.

The file named **.profile** prints out on the printer.

If the file doesn't print, see the section entitled "Solving Printing Problems" later in this chapter.

Setting Up a Printer from the HP–UX Command Line Shell

Follow the instructions in this section to set up a printer if your system does not have HP VUE installed.

If your workstation is running HP VUE, refer to the previous subsection, "Setting Up a Printer with HP VUE," for instructions on setting up a printer.

1. Log in as **root.**

2. Enter the following:

   sam Return

3. The **SAM** window opens. Use your arrow keys on your keyboard to select the line labeled **Printers and Plotters**

   Press Return

4. Use the arrow keys to select **Printers/Plotters**

   Press Return

   If your workstation doesn't have any printers set up, a message window opens. Press Return to remove the message window.

5. At the top of the **Printers/Plotters** window is a list. Press F4 to activate the list.

6. Use the arrow keys to select **Actions**

   Press Return

7. A menu opens below the word **Actions**. Use the arrow keys to select **Add Local Printer/Plotter –>**

Press Return

8. Another menu opens. If your printer is connected to the parallel port on your workstation, use the arrow keys to select **Add Parallel Printer/Plotter**

If your printer is connected to one of the serial connectors on your workstation, use the arrow keys to select **Add Serial (RS–232) Printer/Plotter**

Press Return

A window opens and displays the available parallel or serial interfaces.

9. If you chose **Add Parallel Printer/Plotter** in the previous step, only one parallel interface should be listed. Use the arrow keys to select the listed parallel interface.

Press Tab until **OK** is selected:

Then press Return

If you chose **Add Serial (RS–232) Printer/Plotter** in the previous step, more than one serial interface could be listed. The serial interfaces are listed in ascending order. The lowest numbered serial interface corresponds to the lowest numbered serial connector on your workstation. Use your keyboard arrow keys to select the serial interface that corresponds to the connector to which you have connected your printer.

Press Tab until **OK** is selected:

Then press Return

10. A window opens. Enter a name for the system to use for the printer and then press Return

11. Press Return

The **Valid Models/Interfaces** list opens.

12. Use the arrow keys to select the model number of your printer from the menu.

Then press Return

13. If you want your printer to be set as the system default printer, press Tab until **Make this the system default printer** is selected:

Then press Return

14. Press Tab until **OK** is selected:

Then press Return

15. If the print spooler was not previously running, a window will open with the following question:

```
Do you want to start the print spooler now?
```

Press Return

16. A window opens asking if your printer is powered on, is connected to your workstation, and is online. Check your printer to make sure it meets these requirements.

Press Return

17. In a few moments a window opens with the following message:

```
Task Completed
```

Press Return

The **Printer/Plotter Manager** window now lists your printer.

18. At the top of the window is a list. Press F4 to activate the list.

19. Use the arrow keys to select **List**

Then press Return

20. A menu opens below the word **List**. Use the arrow keys to select **Exit**

Then press Return

The main **SAM** window becomes visible again.

21. Press Tab until **Exit SAM** is selected:

Then press Return

The SAM utility closes and the command line prompt appears.

22. If you made your printer the default system printer, enter the following command to test your printer:

lp .profile Return

If your printer isn't the default system printer, enter the following command to test your printer:

lp –d *printername* **.profile** Return

Where *printername* is the name you chose when setting up your printer.

The file named **.profile** prints out on the printer.

If the file doesn't print, see the section "Solving Printing Problems" later in this chapter.

Setting Up a Printer for Network Printing

If you have a printer physically attached to your workstation, you can set it up to receive print requests from other computers on your network. To do this, you must start up the remote line printer daemon.

Follow the instructions in this section to set up your workstation to accept print requests from other computers on your network.

1. Log in as **root**

2. Use a text editor, such as vi or vuepad, to edit the following file:

   /etc/inetd.conf

3. Find the following section in the file:

```
##
#
#  Other HP-UX network services
#
##
```

4. The following line should be directly below `Other HP-UX network services:`

   # printer stream tcp nowait root /usr/lib/rlpdaemon rlpdaemon –i

   If the line is there, delete the pound sign (#) from the beginning. If the line is not there, add it without the pound sign (#) at the beginning.

   The line should look like the following:

   printer stream tcp nowait root /usr/lib/rlpdaemon rlpdaemon –i

5. Save the file and close it.

6. Enter the following command line to reboot your workstation:

   /etc/reboot Return

   Your workstation will shut itself down and then reboot automatically. This may take a few minutes. When the login prompt returns, your system is ready to accept printer requests from other computers on your network.

Printing a File

To print a file, use one of the following command lines:

lp *filename* Return

or

lp **–d***printername filename* Return

where *filename* is the name of the file that you want to print, and *printername* is the name of the printer on which you wish to print the file.

If the file doesn't print, see the next section, "Solving Printing Problems."

For more information on the **lp** command, enter the following:

man lp Return

Also see the *HP Visual User Environment User's Guide* manual, which came with your workstation, for information on printing files by dragging and dropping the file icon onto the printer tool.

Solving Printing Problems

If you have problems printing check the following:

- Printer's power cord is plugged in.
- Printer is powered on.
- Printer is online.
- Printer has paper loaded.
- Printer is set up for the correct interface type.
- Printer cable is connected to the correct interface port on your printer.
- Printer cable is connected to the correct interface port on your workstation.

Chapter 5
Using Your 3.5–Inch Floppy Disk Drive

This chapter describes how to perform the following tasks with your 3.5–inch floppy disk drive and tells you how to order diskettes:

- Setting the write–protect tab on a diskette
- Inserting and removing a diskette
- Formatting a new diskette
- Transferring data to and from a floppy diskette

NOTICES: User input examples given in this chapter should be entered at the command–line prompt in an HP VUE terminal window or an HP–UX shell.

All instructions in this chapter assume your floppy drive SCSI ID is set to 0 – the default ID set by the factory.

Setting the Write–Protect Tab on a Diskette

You can store or change information on a diskette only when the write–protect tab is in the *write* position, as shown in Figure 5–1.

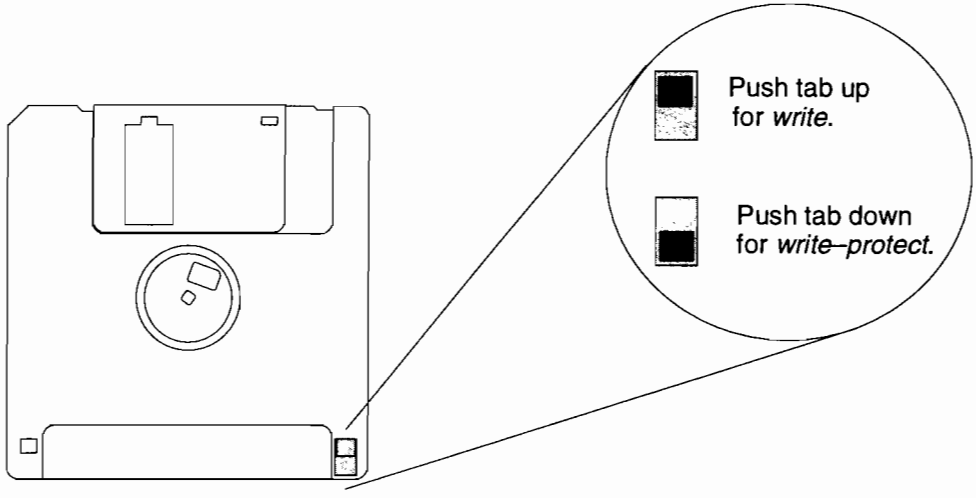


Figure 5–1. Setting the Floppy Diskette Write–Protect Tab

To protect files on a diskette from being overwritten, set the write–protect tab to the *write–protect* position as shown in Figure 5–1.

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

Inserting and Removing a Diskette

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

1. Insert the diskette into the drive, as shown in Figure 5–2.

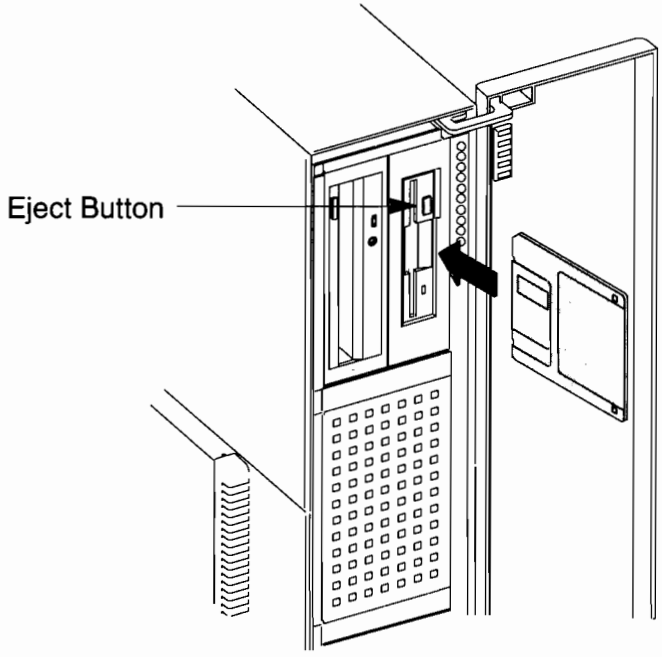


Figure 5–2. Inserting and Removing the Diskette

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

3. To remove the diskette, push the eject button on the front of the floppy drive (see Figure 5–2), then take out the diskette.

Formatting a New Diskette

This section describes how to use a device file to format a new floppy diskette.

Device files are special files that tell your system which pathway to use through the system hardware when communicating with a specific device and what kind of device it is. Your floppy drive uses the device file **/dev/rfloppy/c201d0s0** which uses the default SCSI address 0.

To format a new floppy diskette using this device file, follow these steps:

1. Log in as **root**.

2. Insert the diskette into the floppy disk drive.

3. Execute **mediainit** with an interleave of 2 by entering the following:

   mediainit –i 2 /dev/rfloppy/c201d0s0 Return

NOTICE: Always format a new unformatted diskette with **mediainit** before using it.

Transferring Data To and From a Floppy Diskette

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

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

Device files are special files that tell your system which pathway to use through the system hardware when communicating with a specific device and what kind of device it is. Your floppy drive uses the device file **/dev/rfloppy/c201d0s0**.

You need to set the write protect tab to *write* and load the floppy diskette into the disk drive to transfer data. Refer to the sections "Setting the Write–Protect Tab on a Diskette" and "Inserting and Removing a Diskette" earlier in this chapter.

Saving Files to a Floppy Diskette

To save files to a floppy diskette, use the following steps:

1. Load a formatted floppy diskette into the disk drive. See "Formatting a New Diskette" earlier in this chapter for information on formatting diskettes.

2. Enter the command line:

   tar –cvf /dev/rfloppy/c201d0s0 *pathname* Return

   where *pathname* is the pathname to individual files or a directory containing files.

Restoring Files From a Floppy Diskette To Your System

To restore files from a floppy diskette to your system, use the following steps:

1. Load a formatted floppy diskette into the disk drive. See "Formatting a New Diskette" earlier in this chapter for information on formatting diskettes.

2. Use **cd** to change to the directory you want the files to reside in.

3. Enter the command line:

   tar –xvf /dev/rfloppy/c201d0s0 *pathname* Return

   where *pathname* is the pathname of individual files or a directory containing files.

Listing Files on a Floppy Diskette

To list the files on your floppy diskette, use the following steps:

1. Load a formatted floppy diskette into the disk drive. See "Formatting a New Diskette" earlier in this chapter for information on formatting diskettes.

2. Enter the command line:

   tar –tvf /dev/rfloppy/c201d0s0 Return

   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 or at the HP–UX command line prompt:

man tar Return

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 or at the HP–UX command line prompt:

man cpio Return

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 or at the HP–UX command line prompt:

man floppy Return

Configuring the SCSI Floppy Driver

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

Ordering Information

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

- HP–92192X High Density Micro Flexible Discs (1.44 MB Formatted Capacity) – box of ten diskettes
- HP–92192A Double–Sided Micro Flexible Discs (720 KB Formatted Capacity) – box of ten diskettes

Chapter 6
Using Your CD–ROM Drive

This chapter provides the following information on using your CD–ROM drive:

- Your CD–ROM drive configuration
- CD–ROM drive and media descriptions
- Controls and features of the CD–ROM drive
- Using the CD–ROM drive
- Ordering information

NOTICES: User input examples given in this chapter should be entered at the command–line prompt in an HP VUE terminal window or an HP–UX shell.

The CD–ROM drive is a read–only device. You may access files stored on a CD–ROM disc, but you cannot write to a CD–ROM disc.

All instructions in this chapter assume your floppy drive SCSI ID is set to 2 – the default ID set by the factory.

Your CD-ROM Drive Configuration

Your HP-UX operating system comes with preconfigured device files and drivers. If you use these preconfigured device files and drivers, you won't need to configure your CD-ROM drive with the operating system.

These device files are in the **/dev/dsk** or **/dev/rdsk** directories. The number located in the sixth position in the device file name indicates the SCSI address used in the file. For example, the device file **c201d2s0** located in **/dev/dsk** was created for SCSI address 2.

To create your own device files, you must reconfigure your drive with the operating system. You can use either the System Administration Manager (SAM) or HP-UX commands to set up the kernel and device files. With each, you must perform the following steps:

1. Check the kernel for a device driver. If the device driver is not there, you must create one and then reconfigure the kernel.

NOTICE: All SCSI devices can use the **scsi** device driver.

2. Create the appropriate device files.

3. Add a CD-ROM file system (**cdfs**).

To verify HP-UX system operation, see Chapter 8, "Solving Problems."

For more information on checking or reconfiguring the kernel for a device driver or file, see the *System Administration Tasks Manual: HP 9000 Series 700 Computers.*

CD–ROM Drive and Media Descriptions

This section describes the CD–ROM drive and the CD–ROM media which is called a CD–ROM disc.

CD–ROM Drive

The CD–ROM drive is 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 includes an embedded controller with a SCSI interface.

The CD–ROM drive supports the ISO 9660 and High Sierra format standards. You can access information from the drive like any other disk drive, however, you may not write to the drive.

The CD–ROM has the following environmental requirements:

- **Temperature**

Operating	5 deg. C to 55 deg. C (41 deg. F to 131 deg. F)
Non–Operating	–10 deg. C to 65 deg. C (14 deg. F to 149 deg. F)
Temperature Shock Immunity	10 deg. C/hour
Over–Temperature Shutdown?	No

- **Altitude**

Operating	3.0 km (10000 ft.)
Non–Operating	4600 m (15088 ft.)
Temperature Derating Above 2500 m (8000 ft.)	–1.1 deg. C/305m

- **Humidity**

Operating @ 22 deg. C	–80 %RH (Non–Condensing)
Non–Operating @ 60 deg. C	–90 %RH (Non–Condensing)
Recommended Operating @ 22 deg. C	–50 %RH (Non–Condensing)

CD–ROM Discs

CD–ROM discs are identical to audio compact discs (CDs), except that they store computer data. CD–ROM discs are 120 mm (4.7 in.) in diameter, and use one data surface with a capacity of 600 megabytes. The data surface contains pits and flat spots arranged in a continuous spiral track, which is read at a constant speed.

A CD–ROM disc mounts into a rigid plastic caddy (part number C2293–80001), as shown in Figure 6–1. The drive accesses data on the CD–ROM disc through a shutter in the bottom of the caddy. When you insert the disc caddy into the drive, the shutter opens automatically to expose the disc surface. When you eject the disc caddy from the drive, the shutter closes to protect the disc surface.

NOTICE: CD–ROM drives are only compatible with disc caddy part number C2293–80001. You cannot use a disc caddy from other HP devices.

CAUTION: **Do not** open the shutter manually, as this exposes the disc surface to dust. Over time, dust reduces the reliability of the read head in the CD–ROM drive.

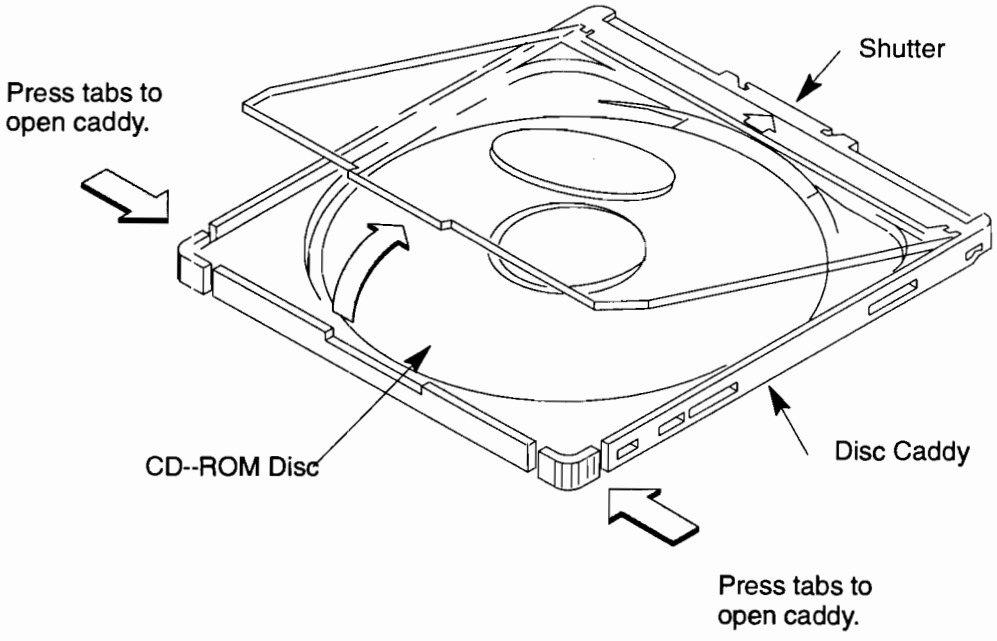


Figure 6–1. CD–ROM Disc and Disc Caddy

Inserting and Removing CD–ROM Discs Into and From the Disc Caddy

This section describes how to open the disc caddy and insert and remove a CD–ROM disc. Refer to Figure 6–1 as you perform the following steps to insert a CD–ROM disc into a caddy:

1. Press the tabs on the outside edges of the CD–ROM caddy inward and open the top cover of the caddy.

2. Hold the CD–ROM disc by the edges with the label side up.

3. Center the CD–ROM disc on the tray in the disc caddy, label side up.

4. Push the cover of the caddy down to close it. Push lightly on the cover until the cover–locking tabs click into place.

To remove a disc from the disc caddy, perform the following steps:

1. Open the disc caddy by pressing inward on the two cover–locking tabs and lifting the cover, as shown in Figure 6–1.

2. Lift the disc out of the disc caddy. Be careful to touch only the edges of the disc.

Caring for CD–ROM Discs

To help prevent data loss and prolong the life of your CD–ROM discs and drive, use the following guidelines:

- 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.

Controls and Features of the CD–ROM Drive

Figure 6–2 shows the operating controls and features of the CD–ROM drive. Table 6–1 describes each of these controls and features.

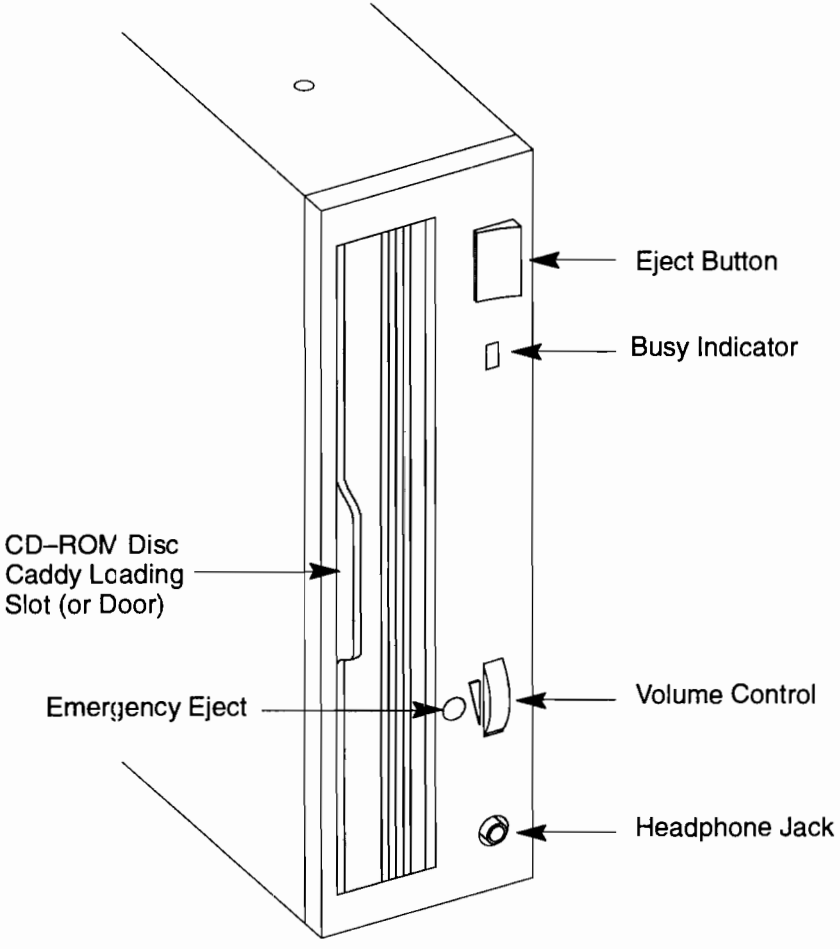


Figure 6–2. CD–ROM Drive Controls and Features

Table 6–1. CD–ROM Drive Operating Controls and Features

Control/Feature	Purpose
Eject Button	Press the Eject Button to eject the disc caddy. When the drive is in use, you must press the eject button for more than one second to eject the caddy.
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: • Defective disc • Disc insertion error (for example, an upside–down disc) • No disc present
Disc Caddy Loading Slot (or Door)	Slot (or door) for inserting the disc caddy. If you eject the disc caddy and want to reinsert it, you must pull the caddy out more than 5 mm (0.2 in.) from the ejected position before reinserting it. The slot does not accept a disc caddy if the drive power is off.
Emergency Eject	By removing the screw and inserting the end of a paper clip, you can eject the disc caddy if the workstation does not have power.
NOTICE:	Your CD–ROM drive can play ordinary Redbook (IEC–809) audio discs by using an application program that generates the appropriate SCSI commands. The application program enables the stereo audio signals at the headphone jack on the front of the drive. The CD–ROM drive does not play audio discs without an application program.

Using the CD–ROM Drive

This section provides the following information about using the CD–ROM drive:

- Loading and ejecting the CD–ROM disc caddy
- Mounting and unmounting a CD–ROM disc
- Reading the drive's busy light

Loading a CD–ROM Disc Caddy

Perform the following steps to load a disc caddy into the CD–ROM drive:

1. Check that the workstation is powered on.

2. Open the caddy loading door and carefully insert the disc caddy in the direction of the arrow about three–quarters of the way into the loading slot until you hear a click, as shown in Figure 6–3. The drive then automatically pulls the caddy the rest of the way into the slot.

CAUTION: **Do not** force the disc caddy into the drive loading slot. Forcing the disc can damage the drive's load mechanism.

NOTICE: The CD–ROM drive will not load a disc caddy if the drive power is off.

If you eject the disc caddy and want to reinsert it, you must pull the caddy out more than 5 mm (0.2 in.) from the ejected position before reinserting it.

You must mount the disc after inserting it into the drive. Refer to the subsection "Mounting a CD–ROM Disc," later in this chapter, for instructions on mounting a disc.

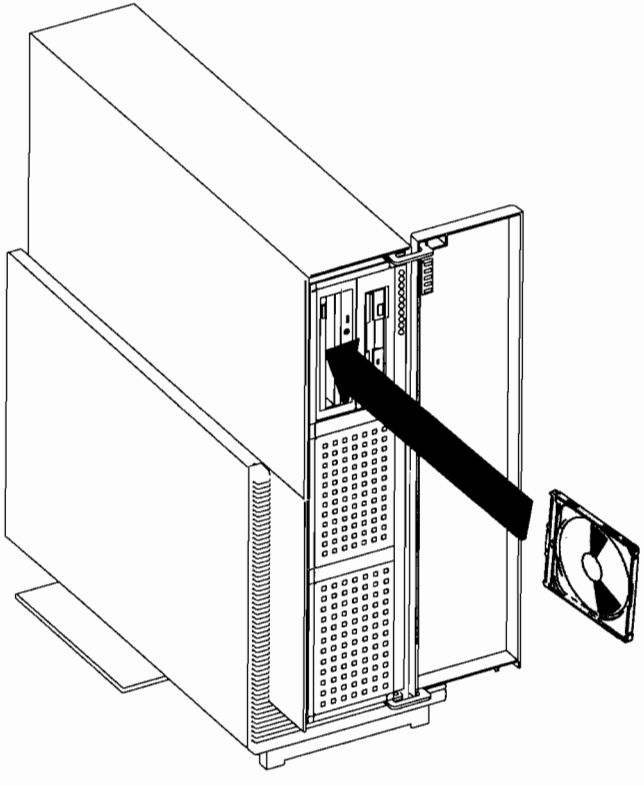


Figure 6–3. Inserting a CD–ROM Disc Caddy

Ejecting a CD–ROM Disc Caddy

Perform the following steps to eject a disc caddy from the CD–ROM drive:

1. Press the eject button to eject a disc caddy from the drive. If the drive is in use, you must press the eject button for more than one second to eject the disc caddy. The emergency eject feature allows you to eject the disc caddy if the normal procedure fails. See Table 6–1.

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

2. Wait until the drive has fully ejected the disc caddy, then slide it all the way out.

Mounting a CD–ROM Disc

To access your CD–ROM drive, you must mount a CD–ROM disc every time you insert it into the drive.

CAUTION: Failure to mount a disc may cause a system error condition and may also require rebooting the system.

Perform the following steps to mount a disc:

1. Insert the CD–ROM disc into the disc caddy, as described in "Inserting and Removing CD–ROM Discs Into and From the Disc Caddy," earlier in this chapter.

2. Load the disc caddy into the drive, as described in "Loading a CD–ROM Disc Caddy," earlier in this chapter.

3. Using the **mkdir** command, create a mount directory (for example, **/cdrom**) to define where to access the CD–ROM file system, as shown:

mkdir /cdrom Return

4. Mount the CD–ROM disc every time you insert it into the drive. The **mount** command uses the following syntax:

mount *sfname directory –options*

where *sfname* is the name of the block device file associated with the drive containing the file system to be mounted.

directory is the mount point directory in the existing file system where the file system is to be mounted.

options are any restrictions specified by the user.

Mount all CD–ROM discs using the **mount** command with **–t cdfs** options. The following example uses the preconfigured block device file **/dev/dsk/c201d2s0** for the CD–ROM drive, set for default SCSI address 2, and **/cdrom** as the mount directory.

/etc/mount /dev/dsk/c201d2s0 /cdrom –t cdfs Return

5. Now you can access the CD–ROM disc as you would any other mounted file system. Enter the following command to change your working directory to the CD–ROM disc:

cd /cdrom Return

Unmounting a CD–ROM Disc

You must unmount the CD–ROM disc before you eject it from the drive.

CAUTION: You must unmount the CD–ROM disc every time you unload it from the drive. Failure to unmount a disc can cause a system error condition and may also require rebooting the system.

NOTICE: Before you unmount a CD–ROM disc, make sure that your working directory is set to a directory other than the one under which the disc was mounted.

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

1. Unmount the disc by entering the following:

   /etc/umount /dev/dsk/c201d2s0 Return

2. Press the eject button on the CD–ROM drive. (See Figure 6–2.)

3. Remove the disc caddy from the drive.

Reading the Busy Light

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

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

- You insert a disc caddy into the drive loading slot.
- You turn on the drive with a disc caddy already loaded.

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 a self test when one of the following conditions exist:

- Defective disc
- Disc insertion error (for example, an upside–down disc)
- No disc present

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

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

The busy light flashes during normal activity with the system.

Ordering Information

To order additional disc caddies for use with your CD–ROM drive, use the following order number:

- C2293–80001 CD–ROM Disc Caddy

Chapter 7
Using Your DDS–Format Tape Drive

This chapter describes how to use and maintain your Digital Data Storage (DDS) format tape drive. It contains information on the following:

- Setting the write–protect tab on a data cassette
- Loading and unloading a data cassette
- Using device files
- Verifying the DDS–format tape drive's address
- Archiving data in compressed and noncompressed mode
- Care and maintenance of your DDS–format tape drive
- Ordering information

If you are using the tape drive for the first time, we recommend you perform the tasks in the order shown in this section.

NOTICE: User input examples given in this chapter should be entered at the command–line prompt in an HP VUE terminal window or an HP–UX shell.

All instructions in this chapter assume your DDS–format tape drive is set to 3 – the default ID set by the factory.

Setting the Write–Protect Tab on a Data Cassette

You can store or change information on a data cassette only when the write–protect tab is in the *write* position, as shown in Figure 7–1.

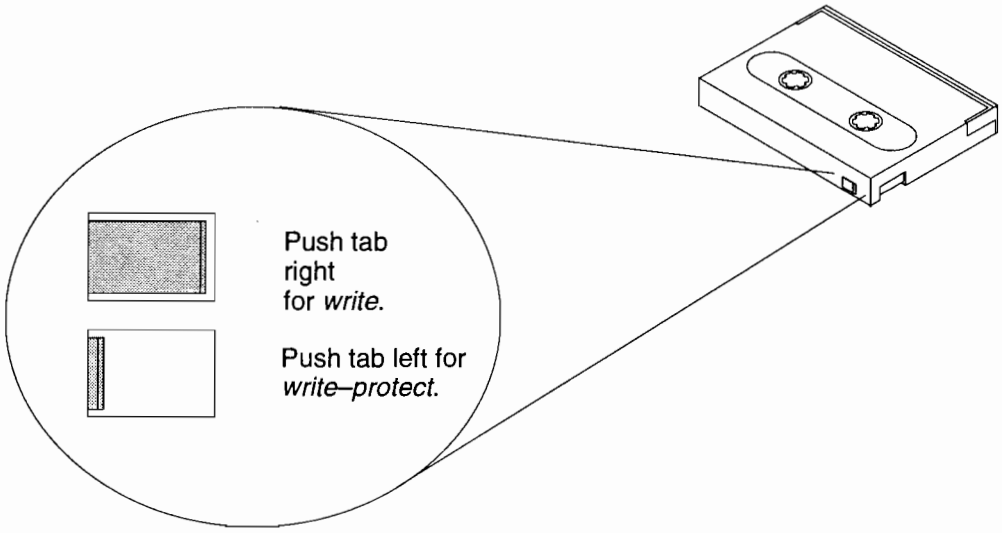


Figure 7–1. Setting the Write–Protect Tab on a DDS–Format Tape

To protect information on a data cassette from being overwritten, set the write–protect tab to the *write–protect* position, as shown in Figure 7–1.

Loading and Unloading a Data Cassette

Follow these steps to load and unload a data cassette from the DDS–format tape drive:

1. Insert the data cassette into the drive, as shown in Figure 7–2.

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

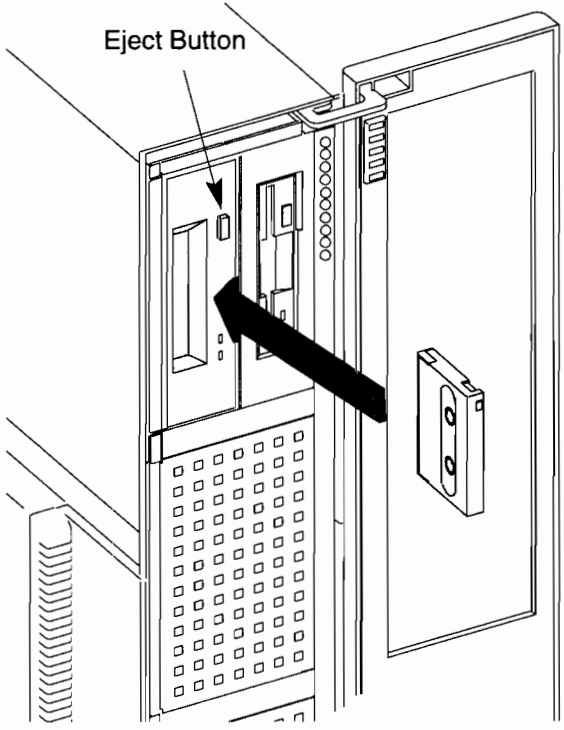


Figure 7–2. Loading a Data Cassette

3. To remove the data cassette, press and release the eject button on the front of the drive, as shown in Figure 7–2. The LEDs on the drive flash on and off. Twenty to thirty seconds later, the data cassette slides partway out of the drive.

4. Remove the cassette from the drive.

Using Device Files

Device files are special files that tell your system which pathway to use through the system hardware when communicating with a specific device and what kind of device it is. Your system has four device files for use with your tape drive: two device files for non-compressed mode and two device files for compressed mode. If you use these device files, you do not need to create any device files. If the SCSI address of your tape drive is not set to the factory default of SCSI ID 3, you need to create a device file. Refer to the *Installing Peripherals* and *System Administration Tasks* manuals for information on how to create a device file before trying to use the tape drive.

Device Files — No Data Compression

Your system has two device files for using your tape drive with data compression turned off. The device files are named **/dev/rmt/0m** and **/dev/rmt/0mn**, and are set for SCSI ID 3. When you use the **/dev/rmt/0m** device file, the tape drive rewinds the data cassette every time the system releases the drive from its control. If you use the **/dev/rmt/0mn** device file, the drive does not rewind the data cassette. The tape stays where it was left after the last operation. If you use these device files, you do not need to create any device files.

Device Files — Data Compression

If your tape drive is labeled **DCLZ** on its faceplate and you wish to use the data compression feature, use the device files **/dev/rmt/0hc** and **/dev/rmt/0hcn** which are set for SCSI ID 3. When you use the **/dev/rmt/0hc** device file, the tape drive compresses the data and rewinds the data cassette every time the system releases the drive from its control. If you use the **/dev/rmt/0hcn** device file, the drive compresses the data, but does not rewind the data cassette. The tape stays where it was left after the last operation. If you use these device files, you do not need to create any device files.

Verifying the DDS–Format Tape Drive's Address

To verify that your workstation can communicate with the DDS–format tape drive, type the following:

ioscan /dev/rmt/0m Return

After a few moments the **ioscan** utility lists all of the input and output devices it could find. The list should include a line similar to the following:

```
2.0.1.n.0          tape_drive          ok
```

where *n* is the SCSI ID of your tape drive. Your DDS–format tape drive is set at the factory to SCSI ID 3. If **ioscan** does not list your tape drive, see Chapter 8, "Solving Problems."

Archiving Data in Compressed and Noncompressed Mode

NOTICE: Before using your DDS–format tape drive to backup your file system, make sure you read the "Media Interchangeability Restrictions" section later in this chapter.

This section describes how to write to, restore data from, and get a file listing from your DDS–format tape drive using the HP–UX **tar** command. This section assumes that you created your device files as described in the previous section.

NOTICE: This chapter's examples use the device file **/dev/rmt/0m**, which archives data in noncompressed mode, causing the drive to rewind the data cassette. To archive data in compression mode, substitute the device file created for data compression. If you named your device files differently, substitute the correct file name where appropriate.

The front of a data compression DDS–format tape drive is labeled **DCLZ**.

Writing Files to a Data Cassette

Use the following instructions to copy data to the tape drive:

1. Check that the write–protect tab on a data cassette is in the *write* position.

2. Load the data cassette into the tape drive.

3. Enter the following command line to write to the tape:

   tar –cvf /dev/rmt/0m *pathname* Return

   where *pathname* is the pathname of the file or directory that you want to write to the tape.

Restoring Files from a Data Cassette

Use the following instructions to restore data from a data cassette:

1. Load the data cassette into the tape drive.

2. Enter the following command line to restore data:

   tar –xvf /dev/rmt/0m *pathname* Return

   where *pathname* is the pathname of the file or directory that you want to restore from the tape. If *pathname* is not specified, everything on the data cassette is restored.

Listing 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. Enter the following command line to receive a file listing of the data cassette:

   tar –tvf /dev/rmt/0m Return

Additional Information

For additional information on **tar**, enter the following:

man tar Return

You can also communicate with the tape drive by using the **cpio**, **fpio**, **mt**, and **fbackup** commands. For more information on these commands, enter the following:

man *command* Return

Care and Maintenance of the DDS–Format Tape Drive

To ensure continued use of your DDS–format tape drive, you need to properly care for your drive. This section describes the following components regarding the care and maintenance of the DDS–format tape drive:

- LED indicators
- LED warning conditions
- Cleaning the tape heads
- Media life
- Media interchangeability restrictions

LED Indicators

The front panel has two colored LEDs (Drive LED and Cassette LED). Figure 7–3 shows the location of the LED indicators and Table 7–1 describes the codes which are displayed.

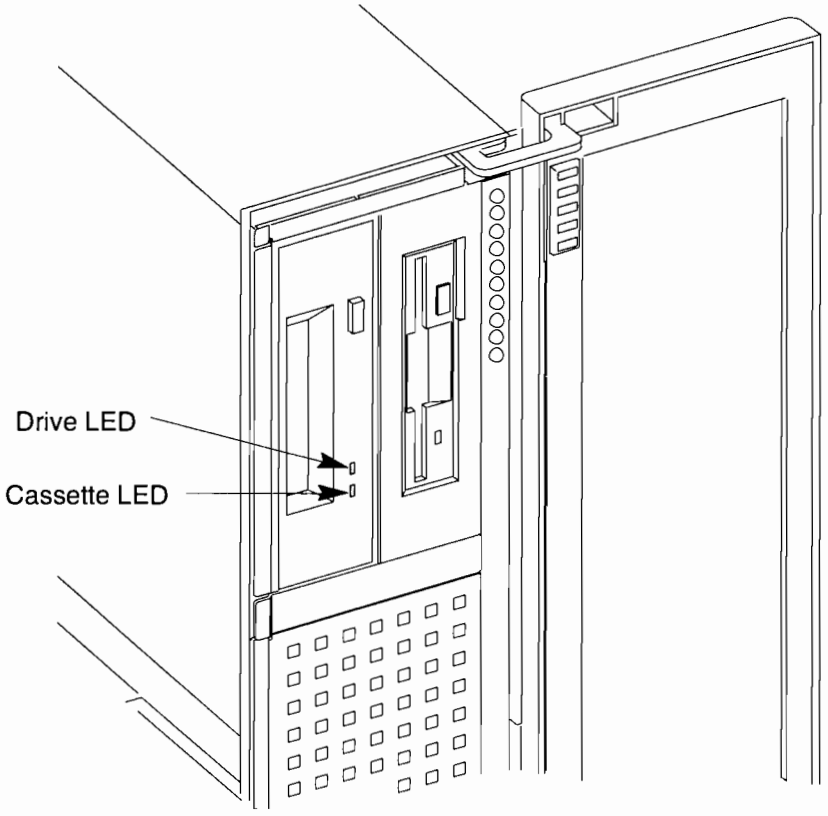


Figure 7–3. DDS–Format Tape Drive LED Indicators

Table 7–1. LED Display Codes

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

Key	
	OFF
	Green
	Amber
	Pulsing Green
	Pulsing Amber
	Pulsing Green and Amber

On the LEDs, green indicates normal operation, and amber indicates a warning condition. Pulsing shows activity between the drive and the SCSI bus.

If the Cassette LED shows steady amber, this indicates that the cassette is write–protected. If the Drive LED shows steady amber, this indicates a fault condition.

LED Warning Conditions

This section describes actions to take if the LEDs indicate a warning condition.

High Humidity

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

Self–Test (Failure)

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

Media Wear (Caution)

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

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

1. Check the system console for any tape error messages. A hard error during a read or write operation may have occurred.

2. Clean the heads with a cleaning cassette (HP92283K), as described in the next section of this chapter, "Cleaning the Tape Heads."

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 and the operation repeated with the new data cassette.

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

Cleaning the Tape Heads

You should 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 indicators.

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 date of each use on the cleaning cassette label to keep track of the number of times it has been used. Discard the cleaning cassette after you have used it 25 times.

Media Life

Hewlett–Packard DDS–format 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 can have multiple passes over the heads, translating into approximately 200 to 300 backups or restores.

Some conditions shorten the life of data cassettes. 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. This is indicated by "clicking" sounds.

Media Interchangeability Restrictions

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

- Data cassettes with compressed data can only be read by tape drives which have data compression capabilities, such as the tape drive (part number C1504–67201) found in Kit A2275A #AHS. This includes data cassettes that contain both compressed and noncompressed data.
- Use 90–meter data cassettes only in the 3 1/2–inch form factor DDS–format tape drives found in Kit A2274A #AHS (part number C1503–67201) and Kit A2275A #AHS (part number C1504–67201). The full height (5 1/4–in) DDS–format tape drives cannot read or write to 90–meter data cassettes.

Ordering Information

To order Hewlett Packard data cassettes and cleaning cassettes for use in your DDS–format 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
- HP92283K Package of two cleaning cassettes

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

Chapter 8
Solving Problems

This chapter contains information to help you determine what's wrong with your system when you have problems. It contains information about the following:

- Common problems and solutions
- LED error codes
- Dealing with a boot failure
- Running system verification tests

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 model number and serial number ready.

Common Problems and Solutions

Tables 8–1 through 8–7 list common problems you can encounter with your workstation and give solutions for those problems.

Table 8–1. Problems Powering Up the System

Problem	Solution
The power LED doesn't light.	Make sure all ac power cables are connected securely to the system. Make sure the power cord is plugged into a working ac outlet. Make sure the power switch is set to the **1** (ON) position.
The power LED lights, but the screen is blank or flickers.	Turn the brightness control on the monitor clockwise. 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. Note the pattern of the LEDs on the front panel of the system unit. Check the LED error codes in "LED Error Codes," later in this chapter.
If problems persist, contact your system administrator or call your designated service representative.	

Table 8–2. Problems with 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 of this guide for default SCSI ID settings.) Check that all SCSI devices are correctly cabled. Check that the SCSI bus is correctly terminated. (See Appendix C of this guide for information on SCSI cabling and termination.) Note the pattern of the LEDs on the front panel of the system unit. Check the LED error codes in "LED Error Codes," later in this chapter.
The system stops or hangs while booting.	Follow the instructions in "Dealing With a Boot Failure," later in this chapter. Note the pattern of the LEDs on the front panel of the system unit. Check the LED error codes in "LED Error Codes," later in this chapter.
If problems persist, contact your system administrator or call your designated service representative.	

Table 8–3. Problems with the 802.3 Network

Problem	Solution
Can't reach other systems on the network. Applications that rely on the network won't run.	Check the network connector on the back of the system unit. Make sure that the cable is fastened securely to the appropriate connector. Make sure that the LAN jumpers are set correctly for your installation. (See "Changing the 802.3 LAN Configuration" in Appendix B of this guide.)
If problems persist, contact your system administrator or call your designated service representative.	

Table 8–4. 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 you specified the device file **/dev/rfloppy/c201d0s0** 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 floppy disk. Follow the instructions in the section titled "Running System Verification Tests," later in this chapter, to verify that the floppy drive is functioning properly.
If problems persist, contact your system administrator or call your designated service representative.	

Table 8–5. 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. Make sure you specified the device file **/dev/dsk/c201d2s0** for commands that require a device file name. Follow the instructions in the section titled "Running System Verification Tests," later 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.	

Table 8–6. Problems Using the DDS–Format Tape Drive

Problem	Solution
The DDS–format tape drive does not respond to commands.	Re–enter the commands and make sure that you have typed them correctly. Make sure 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. Follow the instructions in the section titled "Running System Verification Tests," later in this chapter, to verify that the tape drive is functioning properly.
If problems persist, contact your system administrator or call your designated service representative.	

Table 8–7. Problems with System Memory

Problem	Solution
When booting the system, LED error codes that indicate memory errors are displayed on the front panel LEDs.	Check that the memory slots are configured correctly. (See "Installing Additional Memory" in Appendix B of this guide.)
If problems persist, 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 located inside the system unit front panel.

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

To see these LEDs, open the hinged cover of the system unit. Figure 8–1 shows the location of the system unit front panel LEDs.

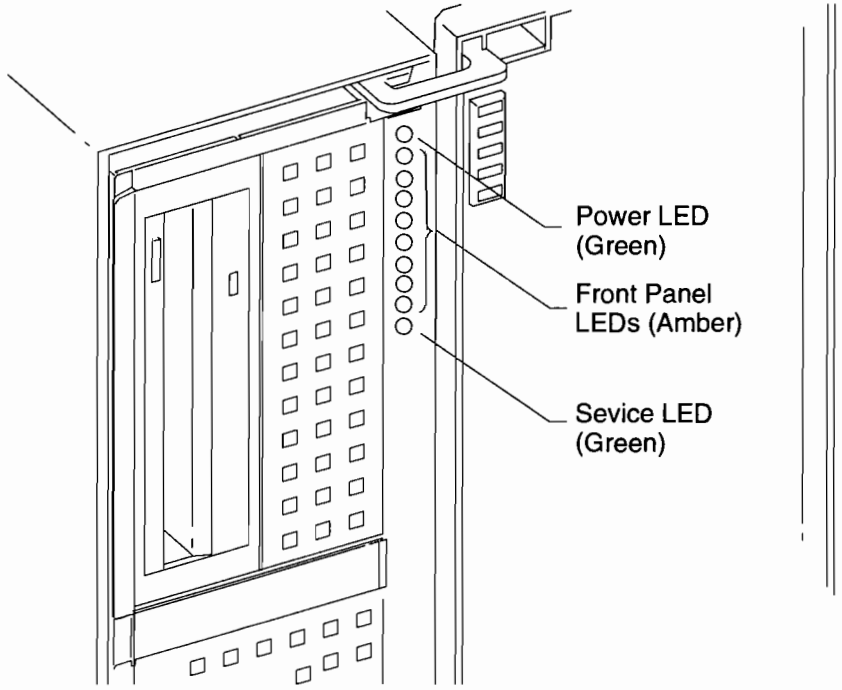
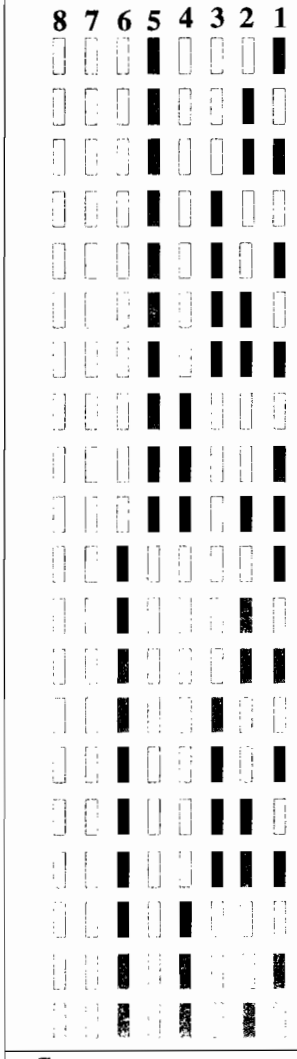


Figure 8–1. Front Panel LEDs

There are ten LEDs; eight amber and two green. When lit, the top green LED indicates that the system power is on and the bottom green LED indicates that service–mode is activated. Service–mode is for use only by manufacturing and Customer Service. The amber LEDs, numbered 1 through 8, top to bottom, indicate system status and error codes that correspond to a variety of hardware error conditions.

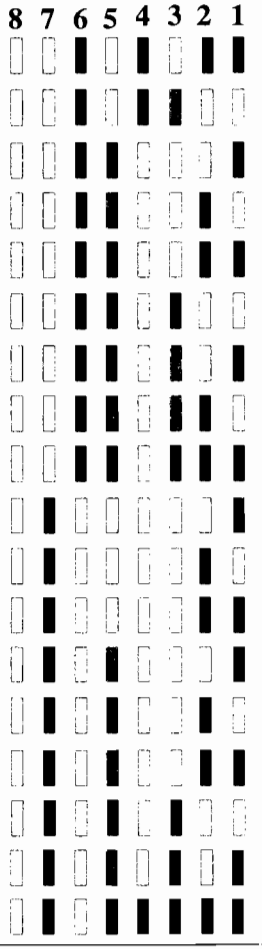
Table 8–8 through Table 8–11 shows the LED error codes as they appear on the front panel display. Use these LED codes to determine the failing component.

Table 8–8. LED Error Codes

LED Display	FRU	Error
	Processor Board	CPU Diagnose Register
		CPU Basic Functions
		CPU ALU & Branch
		CPU Arithmetic Conditions
		CPU Bit Operations
		CPU Arithmetic Side Effects
		CPU Control Registers
		CPU External Interrupts
		CPU Shadow Registers
		TLB Initialization
		Cache Data Line
		Cache Address Line
		Instruction Cache RAM
		Data Cache RAM
		Cache Tag Compare
		Cache Errors
		Cache Configuration
		Cache Flush
		Cache Byte Transaction
		Instruction Cache Miss
■ = LED On or Flashing		

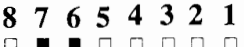
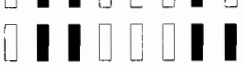
(Continued)

Table 8–8. LED Error Codes (Cont.)

LED Display	FRU	Error
	Processor Board	Data Cache Miss
		Cache Done
		Memory Interface EIR
		Memory Interface HPMC
		Memory Interface
		Memory Interface Invalid Address
		Memory Interface Single Bit Error
		Memory Interface Double Bit Error
		Memory Interface Diagnose Register
		Floating Point Registers
		Floating Point Instructions
		Floating point Traps
	EISA Interface Controller	EISA Init
		EISA ADDR Test
		ADDR Test Failure
		EISA Pattern Test
		EISA Pattern Test Failure
		RAM CHECKSUM Failure
▌ = LED On or Flashing		

(Continued)

Table 8–8. LED Error Codes (Cont.)

LED Display	FRU	Error
	Memory	RAM Slot 0A (J100) Error
		RAM Slot 1A (J102) Error
		RAM Slot 2A (J104) Error
		RAM Slot 3A (J106) Error
		RAM Slot 4A (J108) Error
		RAM Slot 5A (J110) Error
		RAM Slot 0B (J101) Error
		RAM Slot 1B (J103) Error
		RAM Slot 2B (J105) Error
		RAM Slot 3B (J107) Error
		RAM Slot 4B (J109) Error
		RAM Slot 5B (J111) Error
		RAM Configuration & Test In Progress
		No RAM Found
		Non–Destructive RAM Test
		RAM Configuration & Test

8 7 6 5 4 3 2 1

▮ = LED On or Flashing

(Continued)

Table 8–8. LED Error Codes (Cont.)

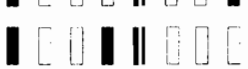
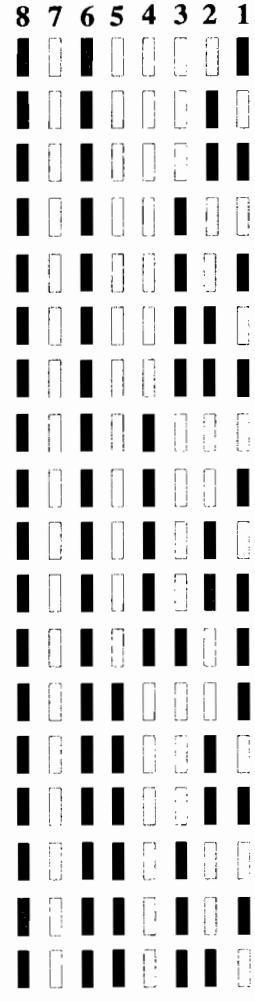
LED Display	FRU	Error
8 7 6 5 4 3 2 1		
	Processor Board	Unknown I/O Device
		Single–Ended SCSI Init
		LAN Init
		HIL Init
		RS232 Port A Init
		RS232 Port B Init
		Parallel Port Init
	SGC Slot 0	Graphics Init
	EISA Card	EISA Slot Init
	FDDI Slider Board	FDDI Init
	Processor Board	Fast Wide SCSI Init
▌ = LED On or Flashing		

Table 8–9. PDC LED Codes

LED Display	Status
	
	Destructive Memory Init
	Non–Destructive Memory Init
	Console Selection
	Boot Device Selection
	Autoselection Failure to Find Boot Device
	Launching IPL
	TOC Handler Entered
	Branching to OS TOC Handler
	Branching to OS HPMC Handler
	EISA Subsystem Init
	Setting Up Default EISA Config
	At Least One Selftest Failed (Service Mode)
	Error Reading EEPROM
	Unexpected Interrupt
	No Console Located
	HPMC Handling Init
	HPMC Due to Cache Error
	HPMC Due to Memory Error
▮ = LED On or Flashing	

(Continued)

Table 8–9. PDC LED Codes (Cont.)

LED Display	Status
8 7 6 5 4 3 2 1	
■ □ ■ ■ □ ■ ■ ■	HPMC Due to Bus Error
■ □ ■ ■ ■ □ □ □	Nested HPMC Detected
■ □ ■ ■ ■ □ □ ■	Error Writing EEPROM
■ □ ■ ■ ■ □ ■ □	Unable to Determine Valid Processor Speed
■ □ ■ ■ ■ ■ □ □	Processor Speed Sensing
■ □ ■ ■ ■ ■ □ ■	Problem Calculating Memory Control Values
■ □ ■ ■ ■ ■ ■ ■	Bad Memory Hardware
■ = LED On or Flashing	

Table 8–10. ISL LED Codes

LED Display	Status
8 7 6 5 4 3 2 1	
	ISL Executing.
	ISL is Autobooting from the Autoexec file.
	ISL Cannot Find Autoexecute file.
	No Console Found. ISL Autobooting.
	Directory of utilities is too large.
	Autoexec File is Inconsistent.
	Error Reading Autoexec File.
	Error Reading from Console.
	Error Writing to Console.
	Not an ISL Command or Utility.
	Utility File Header Inconsistent: Invalid System ID.
	Error Reading Utility File Header.
	Utility File Header Inconsistent: Bad Magic Number.
	Utility Would Overlay ISL in Memory.
	Utility Requires More Memory Than Is Configured.
	Error Reading Utility Into Memory.
	Incorrect Checksum: Reading Utility Into Memory.
	System Console Needed.
▮ = LED On or Flashing	

(Continued)

Table 8–10. ISL LED Codes (Cont.)

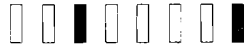
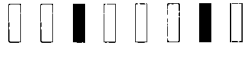
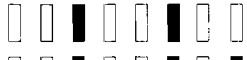
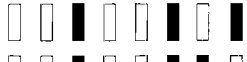
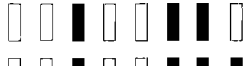
LED Display	Status
8 7 6 5 4 3 2 1	
	Internal Inconsistency: Invalid Boot Device Class.
	Destination Memory Address of Utility is Invalid.
	Internal Inconsistency: pdc_cache entry
	Internal Inconsistency: IODC ENTRY_INIT
	Internal Inconsistency: IODC ENTRY_INIT Console
	Internal Inconsistency: IODC ENTRY_INIT Boot Device
	Utility File Header Inconsistent: Bad aux_id
	Bad Utility File Type
▮ = LED On or Flashing	

Table 8–11. HP–UX Kernel LED Codes

LED Display	Status
8 7 6 5 4 3 2 1	
■ ■ ■ □ □ □ □ □	Kernel Loaded and Initialization Begun.
■ ■ ■ ■ □ □ □ ■	Kernel Has Entered main().
■ ■ ■ ■ □ □ ■ □	Kernel Is About to Configure I/O System.
■ ■ ■ ■ □ ■ □ □	Kernel Is About to Mount Root File System.
■ ■ ■ ■ □ ■ ■ □	Kernel Is About to Set Up Page–Out Daemon.
■ ■ ■ ■ ■ □ □ □	Kernel is About to Start the "INIT" Process.
□ □ □ □ □ □ □ □	Shutdown In Process.
□ □ □ □ □ ■ □ □	TOC Dump.
□ □ □ ■ □ □ □ □	HPMC Dump.
□ □ ■ □ □ □ □ ■	Operating System Executing with Load Indicator X.

+ ■ = LED On or Flashing

Dealing with a Boot Failure

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

To boot a device manually, follow these steps:

1. Shut down your system as described in Chapter 2 or Chapter 3.

2. Turn off the power to your workstation for a few seconds.

CAUTION: **Do not** power off your workstation without first shutting down HP–UX. Powering off with HP–UX still running could damage the data on the disks associated with your workstation.

3. Turn the power back on.

   The system self–test runs automatically. Within a few minutes a message displays. Press and hold the Esc key as soon as this message appears:

```
Selecting a system to boot.
To stop selection process, press and hold the ESCAPE
key.
```

4. Release [Esc] as soon as the following message displays:

```
Selection process stopped.
```

A short time later, this message appears:

```
Searching for potential boot devices. To terminate
search, press and hold the ESCAPE key.

Device Selection   Device Path    Device Type
-------------------------------------------------
```

Your workstation is now searching for devices that may hold file systems from which it can boot HP–UX. As they are found, they appear in a list, similar to the following example:

```
P0                 scsi.6.0       QUANTUM LPS525S
P1                 scsi.5.0       QUANTUM LPS525S
P2                 scsi.2.0       TOSHIBA CD-ROM DRIVE:XM
```

This process may take several minutes. You can terminate the search at any time by pressing [Esc]

If two devices are set to the same SCSI ID, the search terminates when it finds the duplicate SCSI ID. If this happens you must change the SCSI ID of one of the devices.

NOTICE: If no disk devices are listed, your workstation is failing to communicate with its disks. Recheck the SCSI connections and try again. If there are still no devices listed, there is a serious problem. Contact your designated service representative for assistance.

When the search ends, the following list of actions appears:

```
b)  Boot from specified device
s)  Search for bootable devices
a)  Enter boot administration mode
x)  Exit and continue boot sequence
?)  Help

Select from menu:
```

5. If the search locates a disk, attempt to boot from it by entering the **b** (boot) command and a device selection number from the list. For example, if a SCSI disk is listed as item **P0** (as in the previous example list), enter the following:

```
Select from menu:  b P0 Return
```

It may be several seconds before the boot messages begin to appear on the screen. You may hear sounds coming from the disk drive and see a sequence of changing patterns on the LED display.

6. 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 *Using HP–UX HP 9000 Workstations* for help on dealing with file system failures. If you think that something is wrong with the hardware, contact your designated service representative.

Running System Verification Tests

HP–UX uses a diagnostics product called SupportWave. SupportWave contains the Support Tools Manager so that you can verify your system operation.

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

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

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

man cstm Return

man mstm Return

man xstm Return

To run SupportWave from either HP VUE or the HP–UX command line shell, perform the following steps:

1. In a terminal window, to invoke the command line interface, type the following at the # prompt:

   cstm Return

The following screen appears:

```
*************************************************************************
******                                                             ******
******                    SUPPORT TOOLS MANAGER                    ******
******                                                             ******
******                   Command Line Interface                    ******
******                                                             ******
******                      Version  x.xx.xx                       ******
******                                                             ******
******                   Part Number  xxxxx-xxxxx                  ******
******                                                             ******
******          (C) Copyright Hewlett Packard Co. xxxx             ******
******                    All Rights Reserved                      ******
******                                                             ******
*************************************************************************
Please Wait. System mapping in progress . . .
Please type HELP or ? to list 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** Return

The following messages appear:

```
Verification has started on device (CPU).
Verification has started on device (FPU).
Verification has started on device (0/0/0).
Verification has started on device (2/0/1.0.0).
Verification has started on device (2/0/1.5.0).
Verification has started on device (2/0/1.6.0).
Verification has started on device (2/0/2).

CSTM>Message from (0/0/0):
This graphics test displays a number of graphics images on the screen of
the graphics device being tested. If an X server is not currently running on
that display, X Windows will be started and run for the duration of the
test. The Starbase shared library (/usr/lib/libsbisl) should be present to
run this test.

CAUTION: This test will fail if any portion of the test window is modified
         or overlaid in any way.

NOTE: If a VUE login screen is currently displayed on the monitor, the test
will wait until someone logs in the HP VUE on the graphics monitor to re-
lease the lock. The test stops if the Screen Saver times out, it runs again
once the Screen is activated.

WARNING: Do not run this exercise with any other option.
(Type 'R' for Ready, Type 'S' for Skip) [R] >>
```

4. When you see the >> prompt shown above, type **r** Return

The following messages and a graphics test window appear:

```
Verification of (2/0/1.3.0) has completed.  Result status - (Success).
Verification of (2/0/1.5.0) has completed.  Result status - (Success).
Verification of (2/0/1.6.0) has completed.  Result status - (Success).
Verification of (CPU) has completed.  Result status - (Success).
Verification of (FPU) has completed.  Result status - (Success).
Verification of (2/0/2) has completed.  Result status - (Success).
Verification of (0/0/0) has completed.  Result status - (Success).
```

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

6. To exit the Support Tools Manager enter the following:

```
CSTM> exit Return
```

If any tests failed, further diagnosis is necessary by qualified service personnel.

Appendix A
Safety and Regulatory Statements

This appendix contains the following safety and regulatory statements:

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

DECLARATION OF CONFORMITY

according to EN 45014

Manufacturer's Name: **Hewlett Packard**

Manufacturer's Addresses:

100 Domain Drive, Exeter, N.H., USA
130 Herrenberger Str. Boblingen, Germany
9–1 Takakura–cho, Hachioji–shi, Tokyo, Japan

declares that the product

Product: Computer Workstation
Model Number: HP 9000/755/125
Base Product Number: A4105A

conforms to the following Product Specifications:

IEC 950:1986 / EN60950(1988)
CISPR 22:1985 / EN 55022(1988) Class A
IEC 801–2:1991 / pr EN55101–2(1990): 3 kV CD, 8 kV AD
IEC 801–3:1984 / pr EN55024–3(1991): 3 V/m
IEEE 801–4:1984 / pr EN55024–4(1992): 1 kV

Supplementary Information: None

Exeter, N.H. Date Aug. 25, 1994

James H Kelly

James Kelly
Quality Productivity Manager, ECMO

European Contact: Your local Hewlett–Packard Sales and Service Office or Hewlett–Packard GmbH, Department ZQ/Standards Europe, Herrenberger 130, D–7030 Boeblingen (FAX:+49–7031–141623)

Emissions Regulations

Federal Communications Commission (FCC)

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.

Canadian Department of Communications (CDC)

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the Radio Interference Requirements of the Canadian Department of Communications.

Korean Regulations on EMI, 1991·3

Please note that this device has been approved for business purposes with regard to electromagnetic interference.

VCCI Class 1 ITE

この装置は，第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）基準に適合しております。

従って，住宅地域またはその隣接した地域で使用すると，ラジオ，テレビジョン受信機等に受信障害を与えることがあります。

取扱説明書に従って正しい取り扱いをして下さい。

ＶＣＣＩ基準に適合する為に、シールドされたケーブルをご使用下さい。

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.

Datacom Users Statement (United Kingdom Only)

The HP 9000 Series 700 Model 755 is approved under Approval Number NS/G/1234/J/100003 for indirect connection to Public Telecommunications systems within the United Kingdom.

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

(For workstations that have a CD ROM drive installed.)

The CD ROM mass–storage system is certified as a Class–1 laser product under the U.S. Department of Health and Human services (DHHS) Radiation Performance Standard according to the *Radiation Control for Health and Safety Act* of 1968.

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

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 and installation:

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

Warnings and Cautions

WARNING:

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

WARNUNG:

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

ADVERTISSEMENT:

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:

To avoid personal injury and to prevent possible equipment damage, ensure that the ac power is off and the ac power cord is disconnected.

WARNUNG:

Um Verletzungen und mögliche Ausrüstungsschäden zu verhindern, muß die Wechselstromquelle ausgeschaltet sein und das Wechselstromzuführungskabel aus der Steckdose entfernt sein.

ADVERTISSEMENT:

Pour éviter les risques de blessures et de dommages au matériel, s'assurer que le système n'est pas sous tension et que le fil d'alimentation électrique c.a. est débranché.

COMMENT: THERE ARE TWO SETS OF WARNINGS AND CAUTIONS HERE. PICK THE APPROPRIATE ONES.

Warnings and Cautions

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.

ADVERTISSEMENT:

Débrancher la fiche de las 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.

CAUTION:

System power cord must be plugged into an accessible dedicated ac mains receptacle.

VORSICHT:

Das System–Netzanschlubkabel mub an eine zugängliche spezielle Wechselstrom–Hauptzuführungssteckdose angeschlossen werden.

ATTENTION:

Le fil d'alimentation électrique du système doit être branché dans une prise de courant c.a. spécialisée accessible.

Warnings and Cautions

CAUTION:

Do not unplug the monitor video cable while the system unit is powered on.

VORSICHT:

Ziehen Sie nicht das Stromzuführungskabel zum Bildschirm aus der Steckdose, solange das Gerät eingeschaltet ist.

ATTENTION:

Ne pas débrancher le câble vidéo du moniteur pendant que l'unité est alimentée.

Appendix B
Changing Your Workstation's Hardware Configuration

This appendix tells you how to change your workstation's hardware configuration by performing the following procedures:

- Removing the system card
- Restoring the system card
- Installing additional memory
- Changing the 802.3 LAN configuration
- Installing EISA cards

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

Removing the System Card

To remove the system card, you need a straight slot screwdriver. Before removing the system card, make sure that you have performed the following:

- Shut down the operating system
- Turned off the power to the workstation
- Disconnected all power cords and external cables

CAUTION: **Do not** attempt to operate the workstation with the system card removed.

If You Do Not Have FDDI Installed

You must remove the audio board prior to removing the system card. Perform the following steps to remove the audio board and system card:

1. Use a straight slot screwdriver to remove the two screws that hold the audio board to the system bulkhead, as shown in Figure B–1.

2. Pull out the audio board from the back of the system unit.

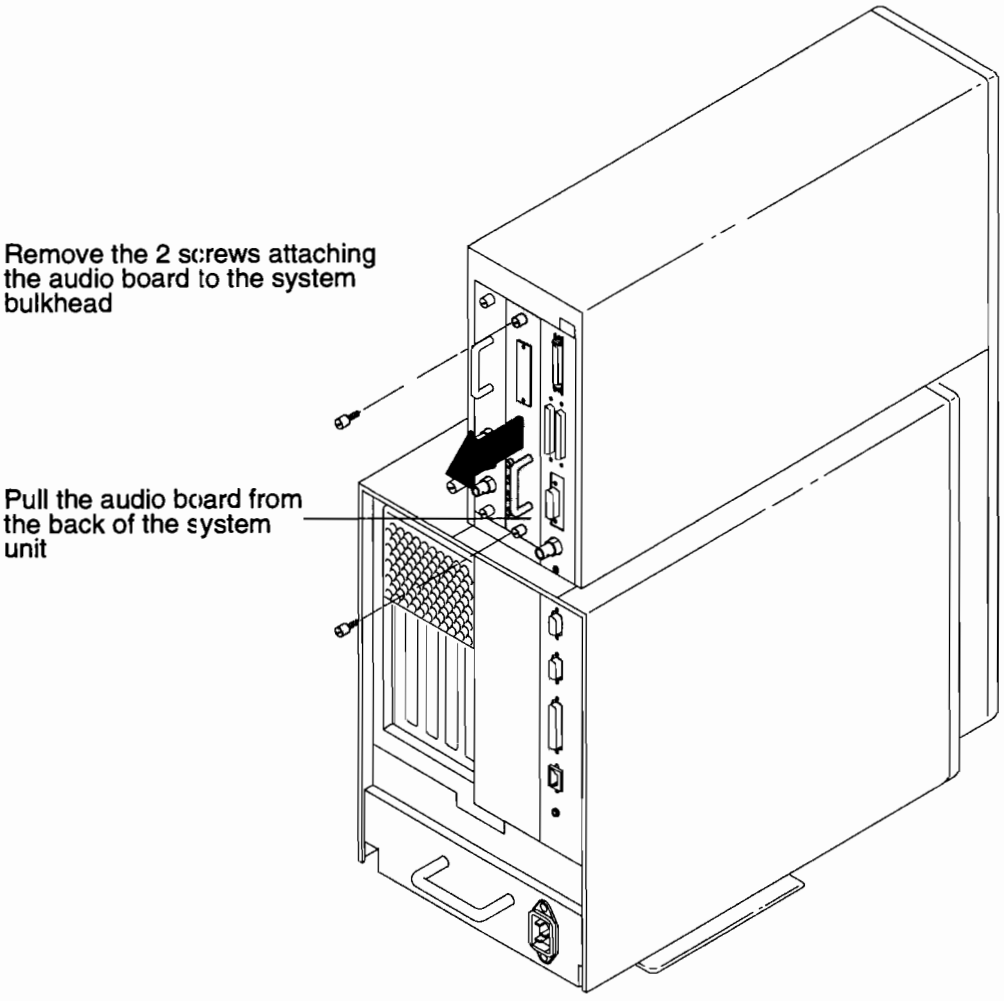


Figure B–1. Removing the Audio Board

3. Use a straight slot screwdriver to remove the five screws that hold the system card to the system bulkhead, as shown in Figure B–2.

4. Pull the release lever, as shown in Figure B–2.

5. Pull out the system card from the back of the system unit.

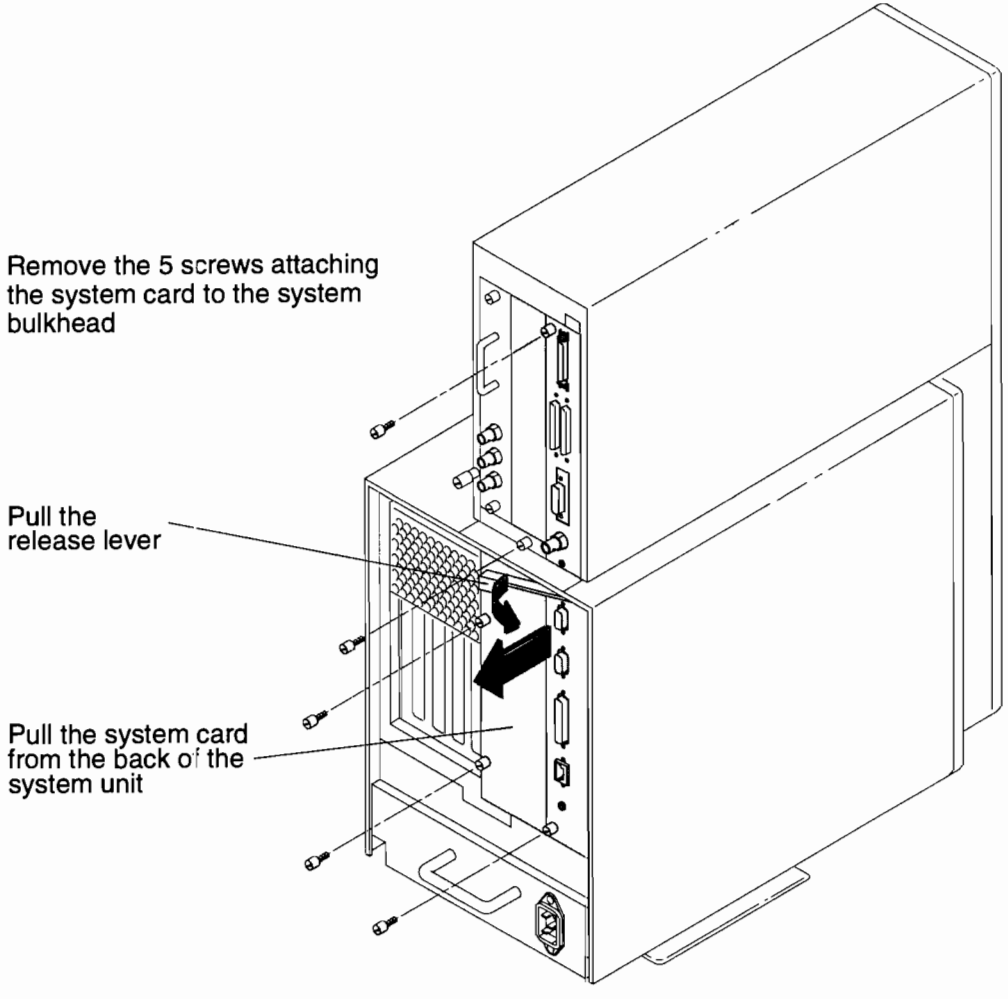


Figure B–2. Removing the System Card (system without FDDI installed)

If You Have FDDI Installed

You can remove the audio board with the system card. Perform the following steps to remove the system card:

1. Use a straight slot screwdriver to remove the seven screws that hold the system card and audio board to the system bulkhead, as shown in Figure B–3.

2. Pull the release lever, as shown in Figure B–3.

3. Pull out the system card from the back of the system unit.

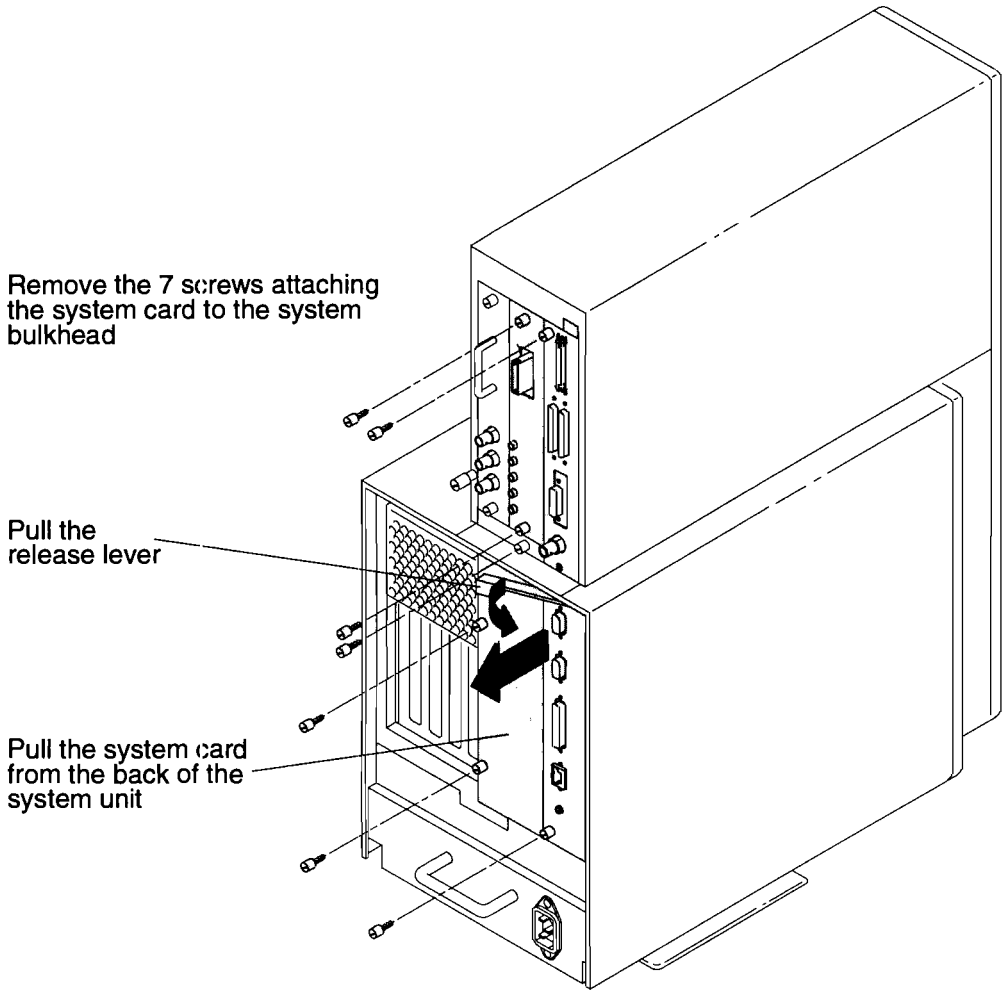


Figure B–3. Removing the System Card (system with FDDI installed)

Restoring the System Card

To restore the system card, perform the following steps:

If You Do Not Have FDDI Installed

You must restore the system card before replacing the audio board. Perform the following steps to restore the system card and audio board:

1. Slide the system card into the back of the system unit, as shown in Figure B–4.

2. Push in the release lever. This presses the system card into the internal connector. To ensure leverage, be sure the end of the lever engages the pawl.

3. Use a straight slot screwdriver to replace the five screws that hold the system card to the system bulkhead, as shown in Figure B–4.

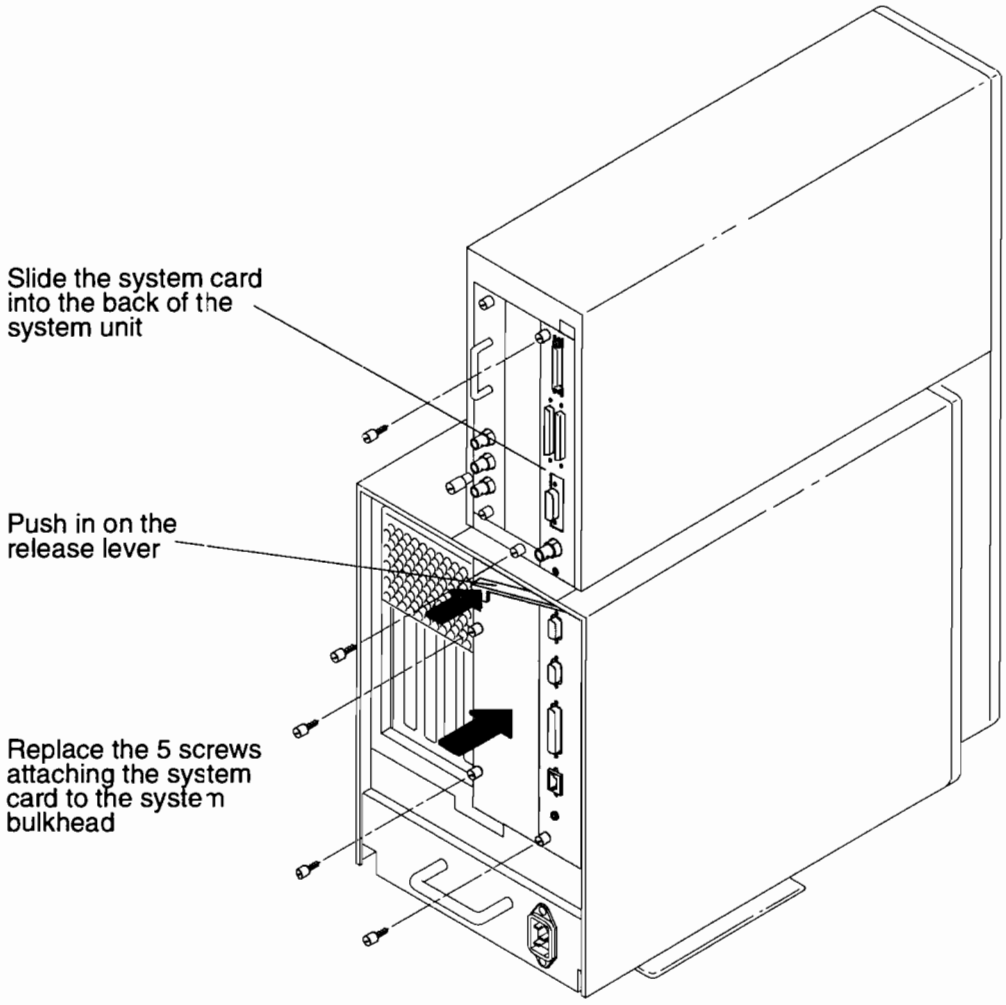


Figure B–4. Restoring the System Card (system without FDDI installed)

4. Slide the audio board into the back of the system unit, as shown in Figure B–5.

5. Use a straight slot screwdriver to replace the two screws that hold the audio board to the system bulkhead.

6. Reconnect any power cords and external cables. Power on your system as described in the installation guide that came with your system.

NOTICE: To maintain FCC/EMI compliance, verify that all screws are replaced and firmly seated.

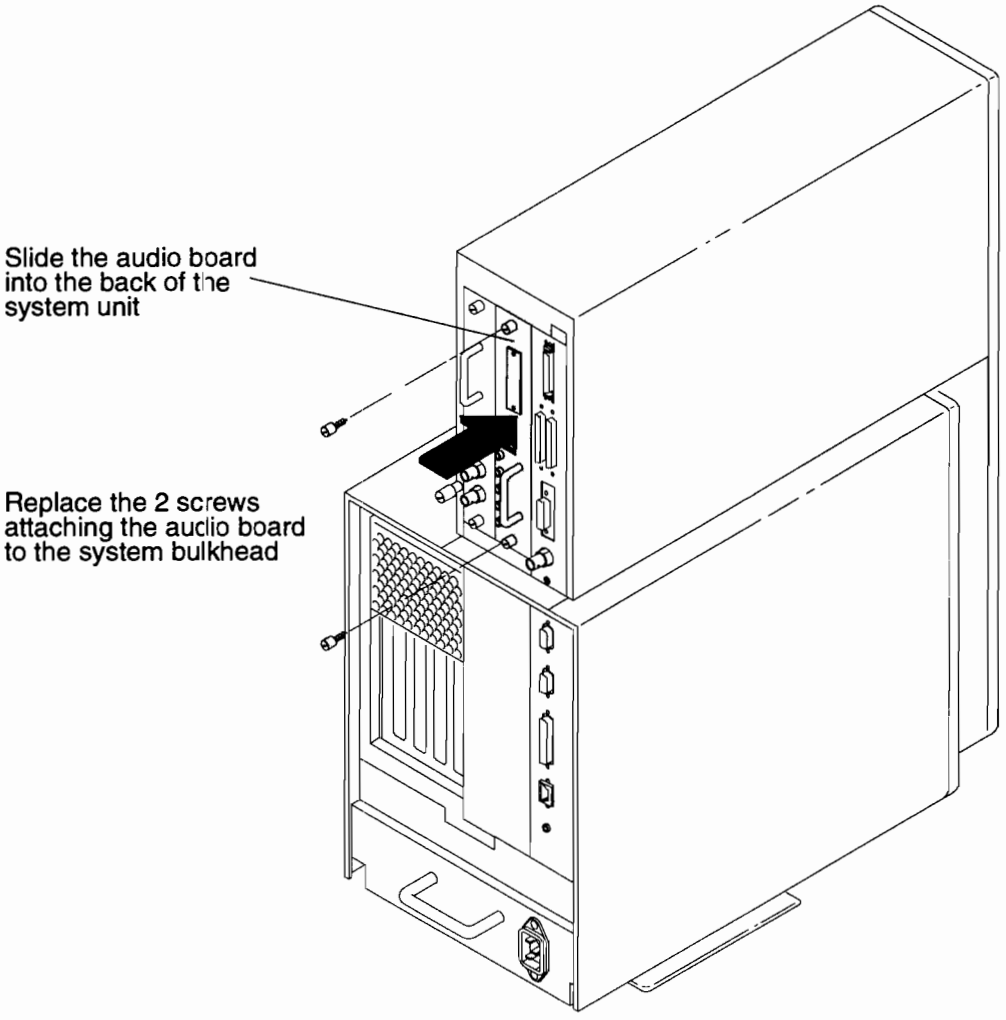


Figure B–5. Restoring the Audio Board

If You Have FDDI Installed

You may replace the audio board along with the system card. To restore the system card, perform the following steps:

1. Slide the system card into the back of the system unit, as shown in Figure B–6.

2. Push in the release lever. This presses the system card into the internal connector. To ensure leverage, be sure the end of the lever engages the pawl.

3. Use a straight slot screwdriver to replace the seven screws that hold the system card and audio board to the system bulkhead, as shown in Figure B–6.

4. Reconnect any power cords and external cables. Power on your system as described in the installation guide that came with your system.

NOTICE: To maintain FCC/EMI compliance, verify that all screws are replaced and firmly seated.

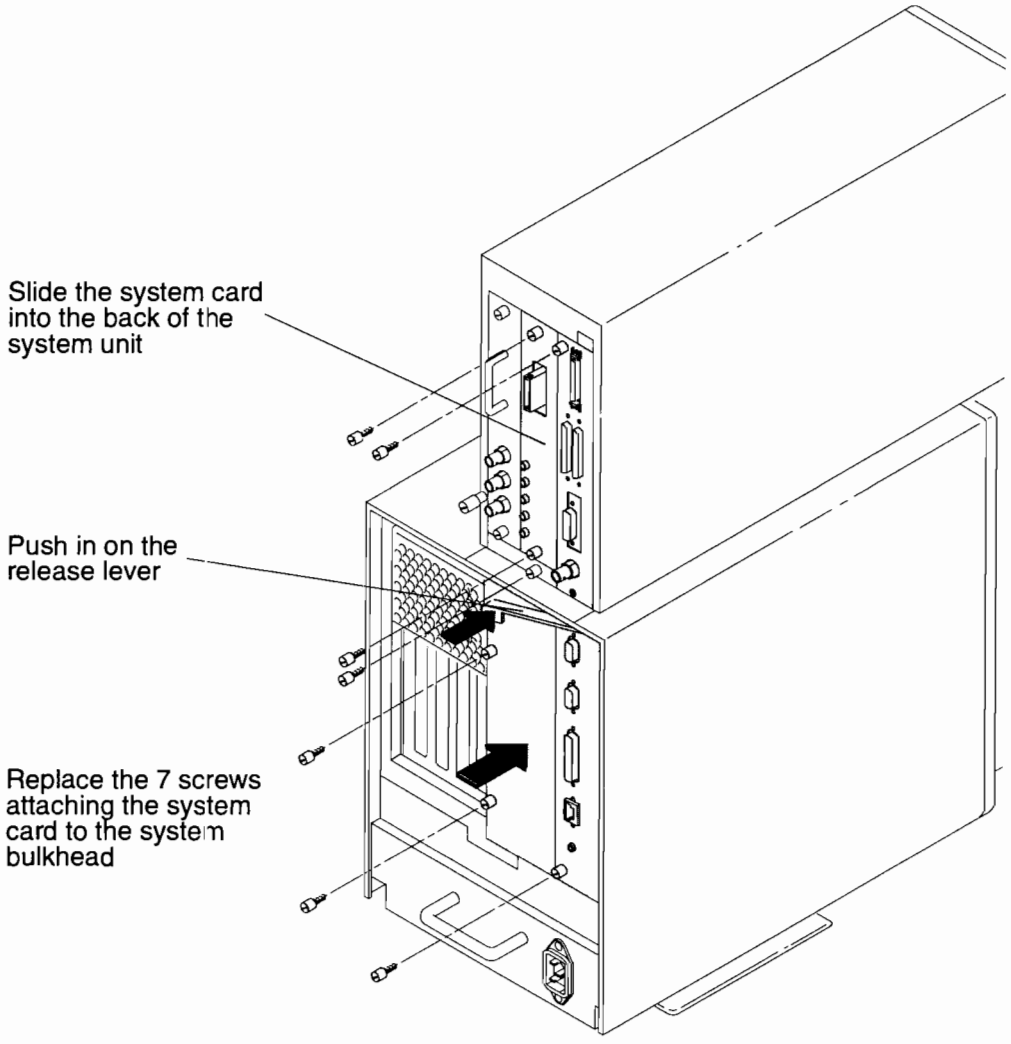


Figure B--6. Restoring the System Card (system with FDDI installed)

Installing Additional Memory

Memory must be installed in sets containing two SIMMS of the same memory capacity. The memory SIMMS are installed in the connectors referred to as Slot J100 through Slot J111.

The SIMM slots are paired as follows:

- J100/J101 (Pair 0)
- J102/J103 (Pair 1)
- J104/J105 (Pair 2)
- J106/J107 (Pair 3)
- J108/J109 (Pair 4)
- J110/J111 (Pair 5)

Perform the following steps to add memory boards to your workstation:

1. Remove the system card as described in the "Removing the System Card" section, earlier in this Appendix.

2. If you need to remove or replace any memory boards in your workstation, perform this step. If you do not need to remove any memory boards, skip this step and go directly to Step 3.

   To remove a memory board, push the two slot clips out and then lift the memory board up and out of the connector. Place the memory board on a static–free surface. Figure B–7 shows how to remove the memory board.

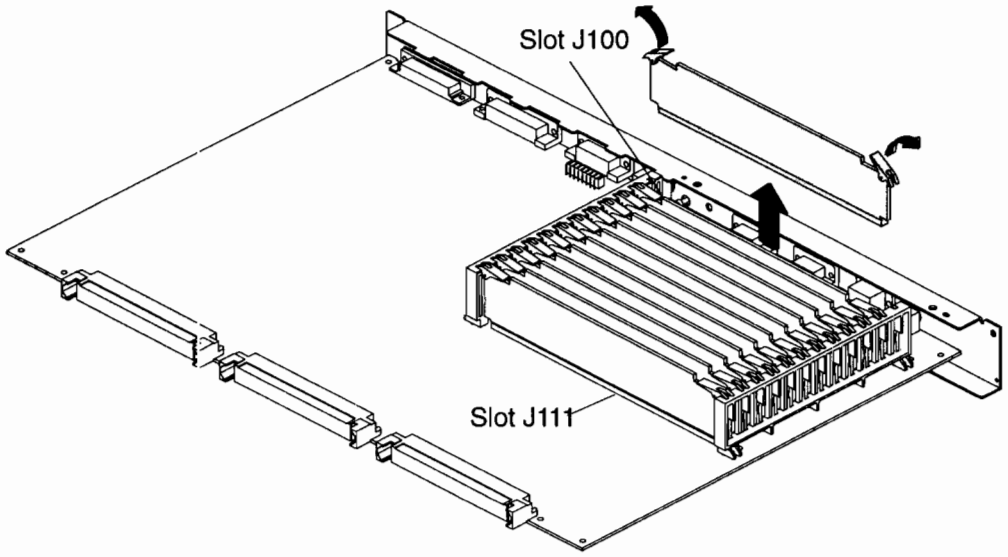


Figure B–7. Removing Memory Boards

NOTICE: Memory board card guides bow when completely filled and prevent the memory board from disengaging from the carrier. To remove memory boards when the memory board card guides are filled, push in the guides with your fingers while pulling out the clips on the memory board with your thumbs.

3. Install the new SIMM card pairs into the next adjacent empty connector pairs on the system card, as shown in Figure B–8. For example, if slots J100/J101 contain the only pair of memory boards, you would install the next pair of memory boards into slots J102/J103. Slots are numbered from right to left across the system card.

CAUTION: When installing memory SIMMs on the CPU board, lay the CPU board flat by hanging the bulkhead over the edge of a work surface. This ensures that the CPU board is fully supported and will not flex and possibly be damaged when inserting SIMMs.

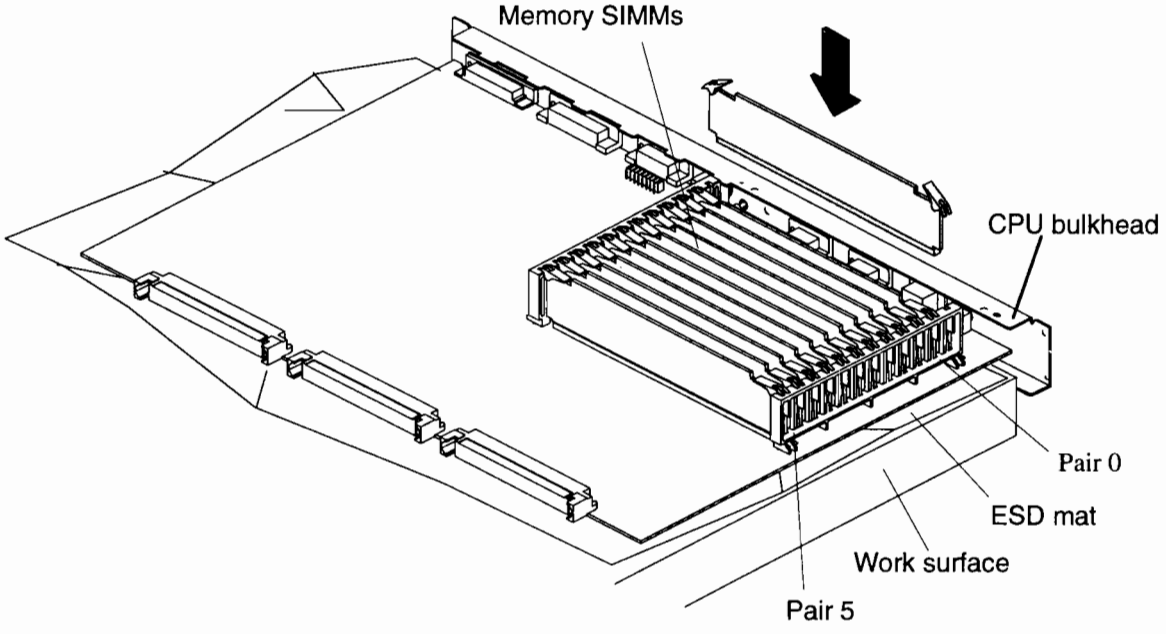


Figure B–8. Installing Memory Boards

Press firmly on the memory board to ensure that it is fully seated. The clips snap in when you press the board into the connector.

Figure B–9 shows the memory board and connector pair sequence.

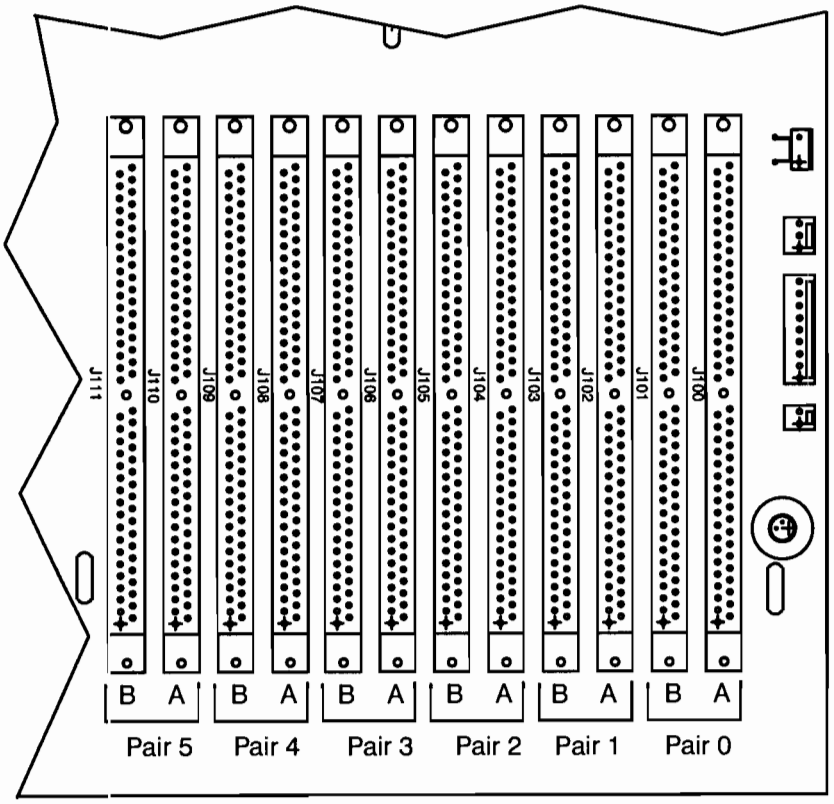


Figure B–9. Memory Board Sequence

4. Restore the system card and reconnect all cables as described in the "Restoring the System Card" section, earlier in this appendix.

Changing the 802.3 LAN Configuration

This section describes how to change your workstation's 802.3 LAN configuration. The LAN configuration was factory set for either the Internal Transceiver (Thin LAN) or the External Transceiver (AUI LAN) setting. You need a pair of needle–nose pliers or a DIP extractor tool to change the LAN jumper. Be careful not to damage the jumper.

Perform the following steps to change the jumper settings.

1. Remove the system card according to the directions in the previous section "Removing the System Card."

2. Use a small pair of needle–nose pliers or a DIP extractor tool to change the jumper. (Figure B–10 shows the location and settings of the jumper.)

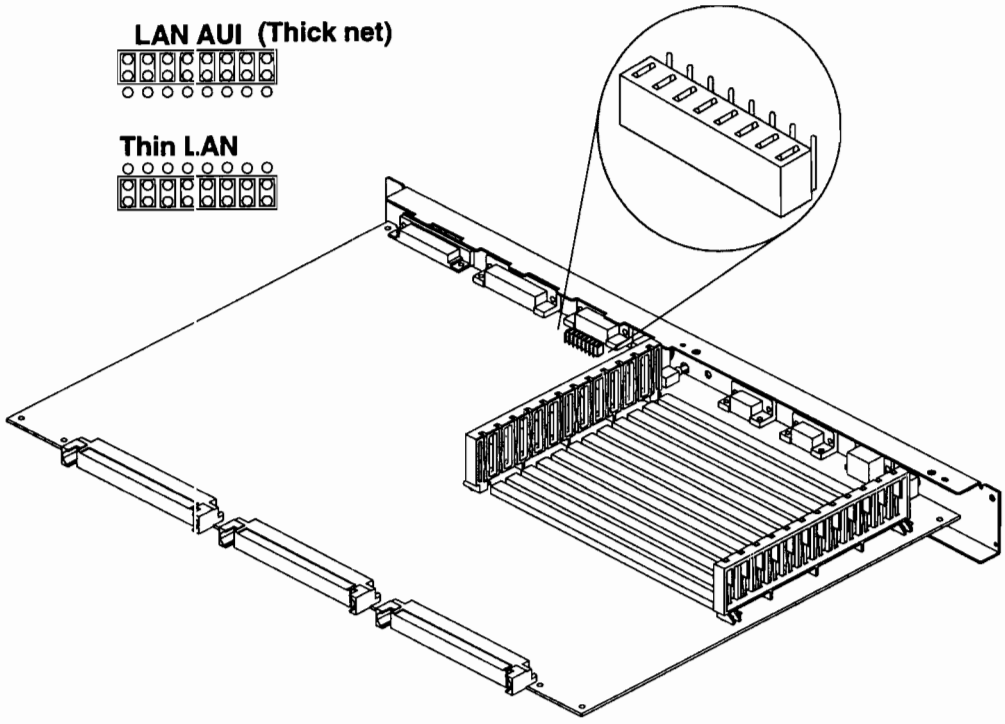


Figure B–10. LAN Configuration Jumper

3. Restore the system card and reconnect all cables as described in the "Restoring the System Card" section, earlier in this appendix.

Installing the EISA Cards

Before you install an Extended Industry Standard Architecture (EISA) card, it is important to check the power ratings for the EISA cards you want to install and compare them to the total power limitations for the Model 755. There are power limitations within the EISA card cage for Series 700 models that have multiple EISA slots. These limitations depend on your workstation's graphics and mass storage options. When adding EISA cards to the EISA card cage, use Tables B–1 and B–2, the manuals that ship with HP options, and any third–party documentation to determine if the system can meet the power requirements of the new option cards.

NOTICE: On the Model 755/125 the power allocation for the EISA card cage is 100 watts. Power limitations are not dependent on graphics and mass storage options in this workstation. You only need to use steps 1 and 2 and Table B–1 when determining the total power usage for EISA cards for the Model 755.

Perform the following steps to determine total power consumption of your EISA card:

1. Check Table B–1 for the power specifications of your EISA card. If you are installing an HP option device card that is not listed in Table B–1 or a third–party option card, obtain the power specifications from the option card documentation.

2. Write the power figures for each of your system's EISA device cards in the **Work** column of Table B–1. Add the figures in the **Work** column, and write the total in the **Total EISA Card Usage** space provided.

Table B–1. EISA Device Cards Power Ratings

EISA Device Cards	Power Ratings	
	Watts	**Work**
HP–IB Controller (25560A)	15.3	_____
SCSI–Differential (25525A)	15.4	+ _____
802.3 LAN (25567A)	17.0 typical 21.3 AUI	+ _____
802.5 LAN (J2165A)	11.2	+ _____
FDDI (J2156A)	10.0	+ _____
X.25 (PSI) (J2159A)	19.2	+ _____
Other _____		+ _____
Other _____		+ _____
Other _____		+ _____
		Total EISA Card Usage = _____

3. For the Model 755 workstation, compare the **Total EISA Card Usage** figure you got in Table B–1 to the **EISA Power Limits** in Table B–2 based on your configuration. For example, if your system has 1 CRX24 graphics option, 2 hard disks, and a removable media device, you can have EISA devices with a total capacity of 54W.

NOTICE: For the Model 755/125 workstation, you do not need to use the following table. The power allocation for the EISA card cage in this workstation is 100 watts. No restrictions apply.

Table B–2. EISA Power Limits (Model 755/99)

Graphics Options	Internal Mass Storage Options			
	Removable Media Drive(s) and 2 Hard Disks	Removable Media Drive(s) and 1 Hard Disk	2 Hard Disks only	All Other Options
2 CRX24 Options or 1 CRX24Z Option	31W	47W	60W	70W
1 CRX24 Option	54W	70W	70W	70W
All Other Graphics	60W	70W	70W	70W
No Graphics Options	70W	70W	70W	70W

CAUTION: The EISA Card Usage **must not exceed** the EISA Power Limits. The maximum power usage for EISA cards in the Model 755 workstation is **70 watts**. Call your Customer Service representative for more information.

To install your EISA card(s), perform the following steps:

1. Shut down your system using one of the procedures described in the "Getting Started" chapters of this book (Chapter 2 or 3, depending on whether or not you are running HP VUE).

2. Turn off the power to your system and any peripherals, and unplug their power cables.

3. Attach the static–grounding wrist strap by following the instructions on the package.

4. Remove the top cover of the system card cage by removing the thumb screw at the back of the system, and sliding the top cover to the back and pulling it off, as shown in Figure B–11.

5. Remove the right–side cover, as shown in Figure B–11.

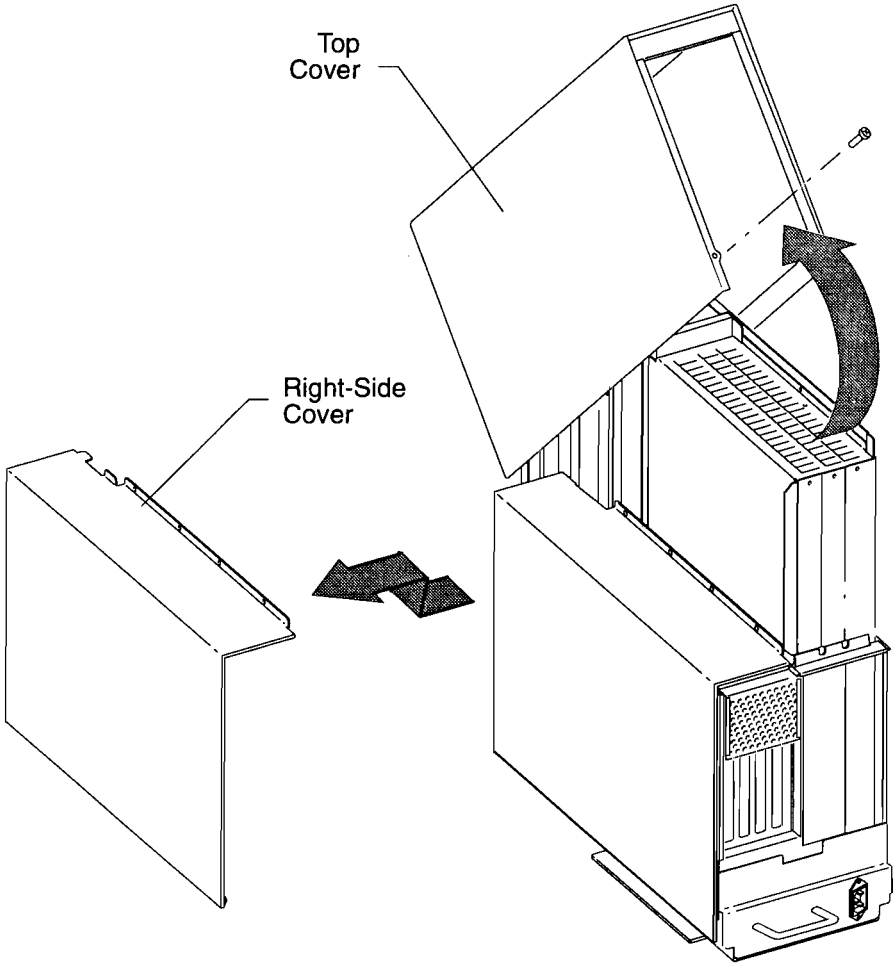


Figure B–11. Removing the Top and Right–Side Covers

6. Remove the RFI shield cover by pressing down on the four tabs that fit into the center wall at the top edge of the shield and pulling the cover out, as shown in Figure B–12.

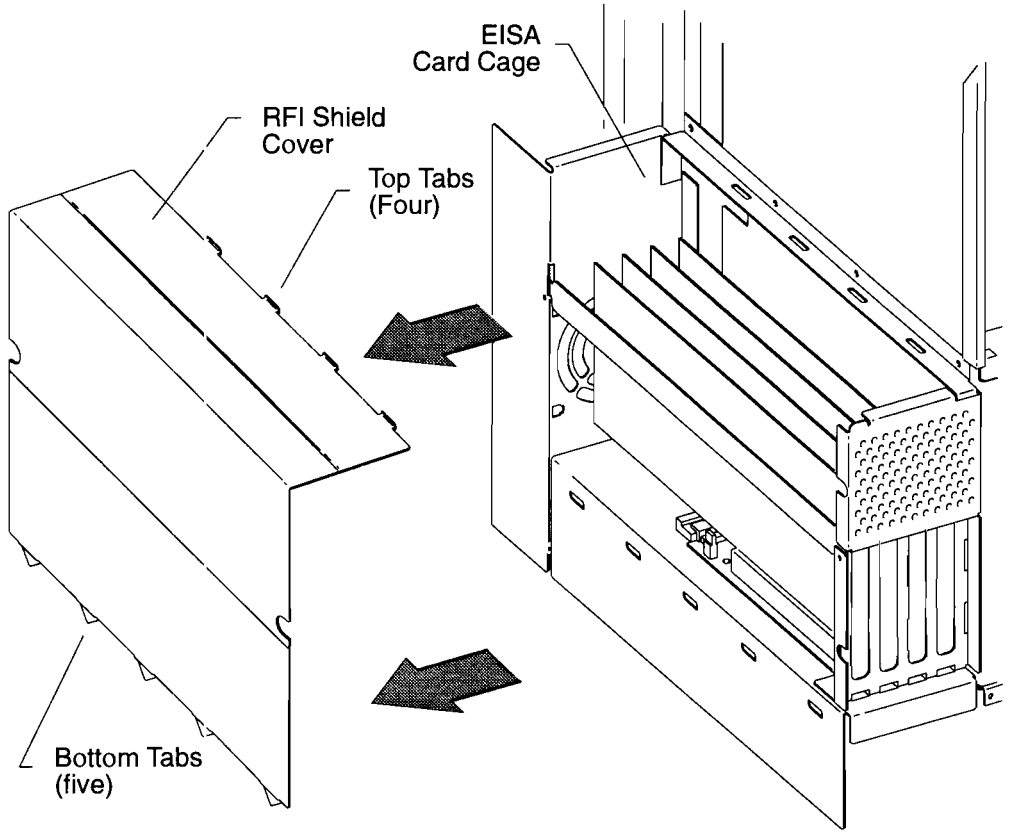


Figure B–12. Removing the RFI Shield Cover

7. Remove the EISA faceplate on the EISA card cage slot where you plan to install the EISA card by removing the retaining screw that holds the faceplate to the card edge, as shown in Figure B–13.

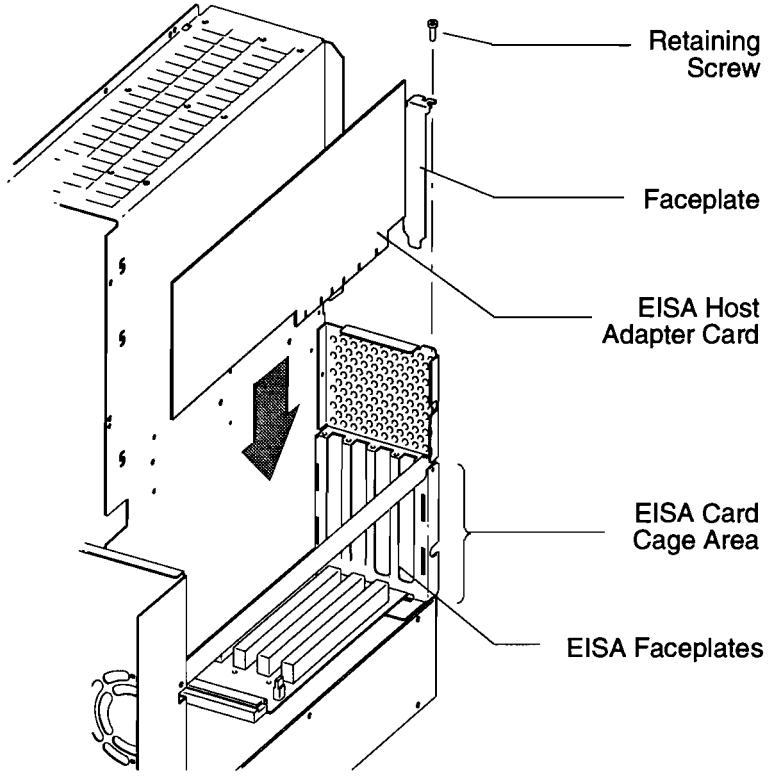


Figure B–13. Inserting the EISA Card

8. Insert the EISA card into the card cage and install the retaining screw, as shown in Figure B–13. Make sure that the retaining screw is fully seated.

9. Replace the RFI shield cover by inserting the five tabs that fit into the lower part of the card cage and pushing in the four tabs that fit into the top edge of the shield, as shown in Figure B–14.

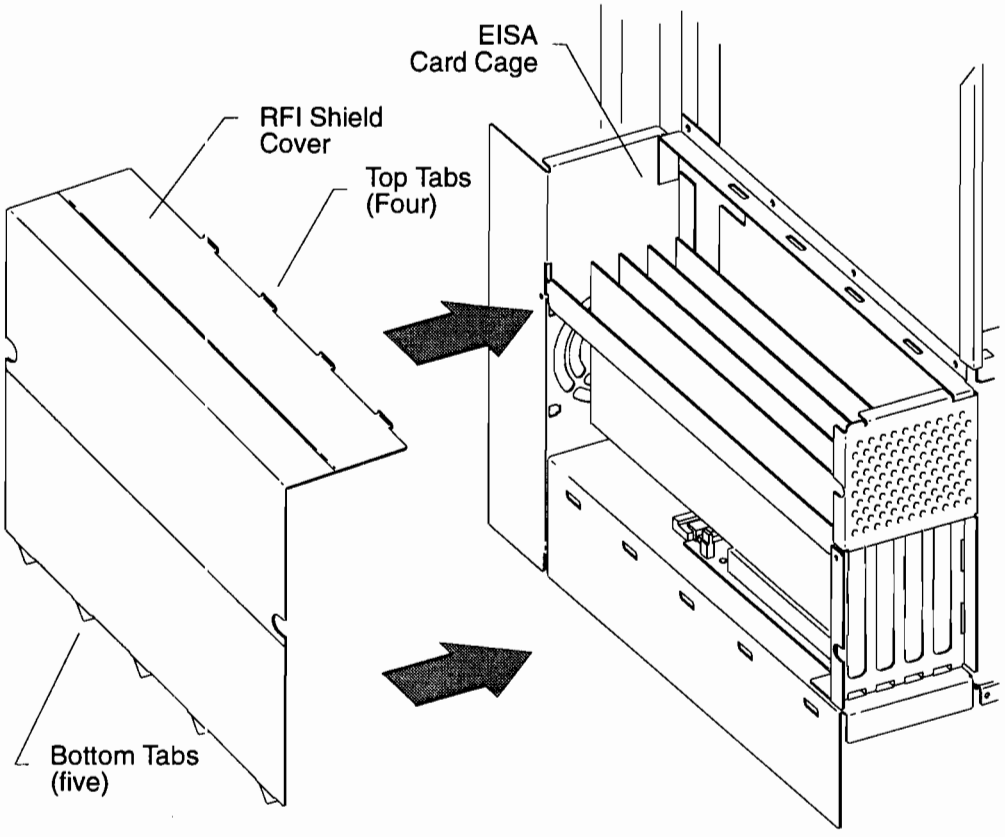


Figure B–14. Replacing the RFI Shield Cover

NOTICE: To maintain FCC/EMI compliance, verify that all screws are replaced and firmly seated.

10. Replace the right–side cover, as shown in Figure B–15.

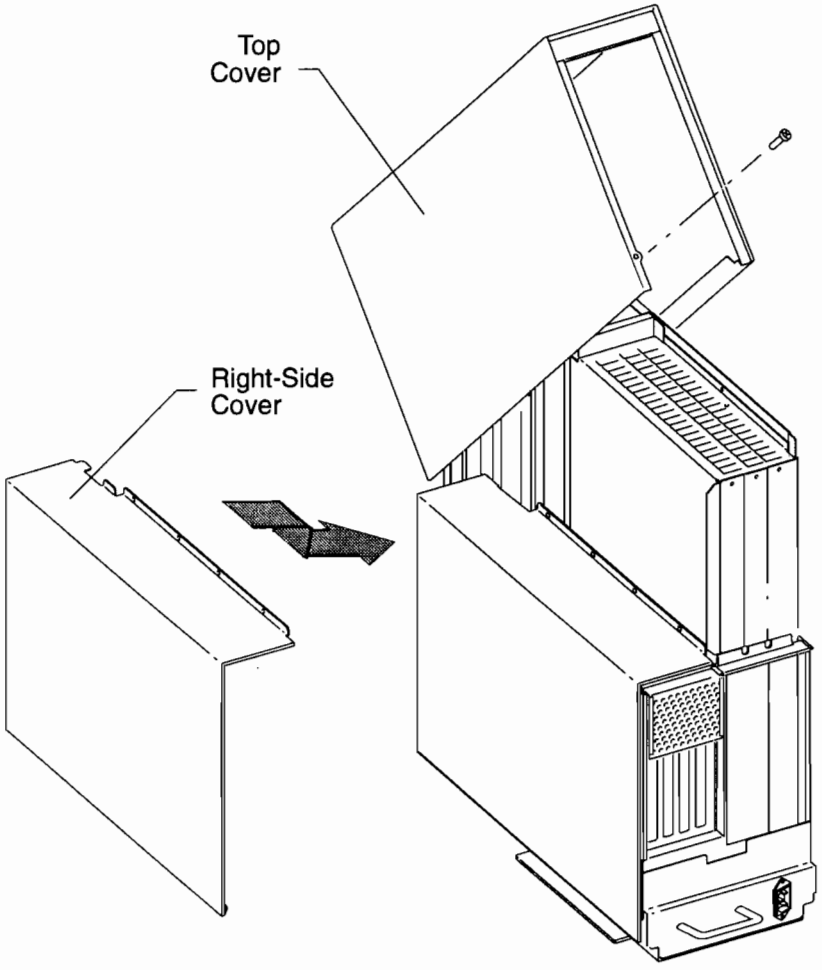


Figure B–15. Replacing the Right–Side Cover

11. Replace the top cover and slide it toward the front of the system. Reinstall the thumb screw at the back of the system, as shown in Figure B–16.

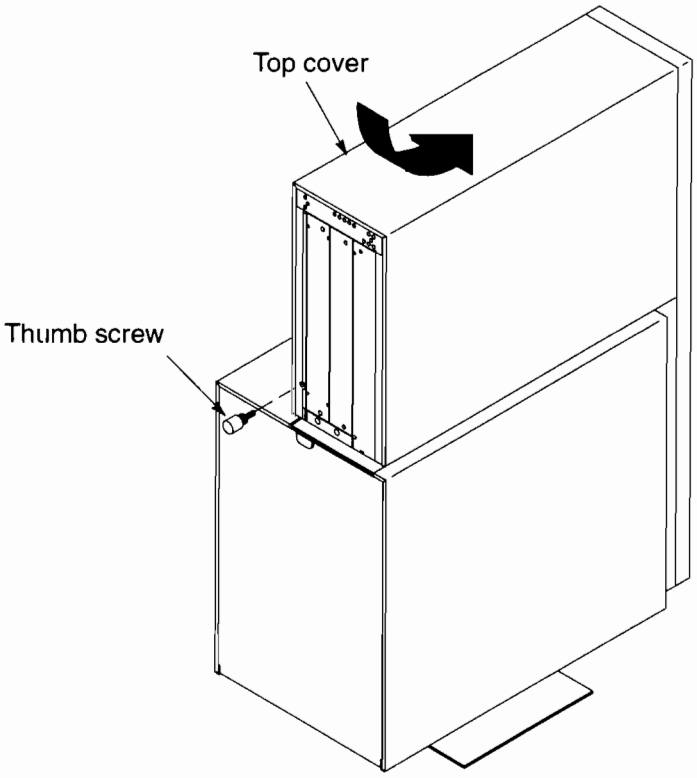


Figure B–16. Replacing the Top Cover

12. Plug in any power cables and turn on your system.

Appendix C
SCSI–2 Connections

This appendix provides the following information about connecting SCSI–2 devices to an HP 9000 Model 755 workstation:

- SCSI bus differences
- SCSI–2 restrictions
- Determining SCSI–2 bus length
- Assigning SCSI–2 device IDs
- Connecting to the SCSI–2 port

NOTICE: If there are no external SCSI–2 devices attached to the system, you must terminate the SCSI–2 bus. Connect the terminator that was shipped with your workstation to the external SCSI–2 connector on the rear of the system unit.

SCSI Bus Differences

A Small Computer Systems Interface (SCSI) bus is an IEEE standard bus for connecting your workstation to internal and external devices (SCSI–2 devices) running at different speeds, singly or in combination. Examples of these SCSI–2 devices are floppy disk drives, 4–mm DDS–format tape drives, CD–ROM drives, and Winchester hard disk drives.

There are three types of SCSI buses available with the Model 755 workstation: the single–ended SCSI bus; the fast differential SCSI bus; and the fast, wide SCSI bus. Table C–1 shows the specification differences between these SCSI buses, and Table C–2 shows the SCSI–2 addresses, ID numbers, and arbitration priorities for each.

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

Table C–1. SCSI Bus Differences

Transfer Rate	Data Bus Width	Maximum Addresses*	Maximum Cable Length	Device Physical Location	Controller Imbedded or Plugable
Single–Ended up to 5 Mbytes per second	8 bits	8	6.0 meters (19.6 feet)	internal and external	imbedded
Fast Differential up to 10 Mbytes per second	8 bits	8	25 meters (82 feet)	external only	plugable
Fast, Wide up to 20 Mbytes per second	16 bits	16	25 meters (82 feet)	internal and external	imbedded
* Address 7 is reserved for host controller use on all three types of buses.					

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

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

SCSI–2 Restrictions

This section describes the SCSI–2 restrictions for the workstation in the following areas:

- Cables
- Connectors and terminator
- SCSI–2 configuration constraints

Cables

All SCSI–2 devices ship without cables. Only SCSI–2 cables approved by HP can be used to connect your workstation and any SCSI–2 devices for the system card.

HP offers the following standard SCSI–2 cables for single–ended SCSI–2 devices:

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

HP offers the following fast differential SCSI–2 cables for connecting EISA/SCSI–2 to fast differential stand–alone storage boxes:

- C2906A cable with 2.0 meter (6.6 feet) length
- C2907A cable with 5.0 meter (16.4 feet) length
- C2916A cable with 20.0 meter (65.6 feet) length

HP offers the following fast, wide SCSI–2 cables for connecting externally connected devices to the system fast, wide port:

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

CAUTION: SCSI–2 cables approved by HP are designed to function within the SCSI–2 tolerances for HP devices. Use of other cables can result in significant problems with system operation.

Singled–ended SCSI–2 definition limits the total cable length of SCSI–2 cables to 6 meters (19.6 feet).

Fast differential SCSI–2 (EISA option) definition limits the total cable length of SCSI–2 cables to 25 meters (82 feet).

Fast, wide SCSI–2 definition limits the total cable length of SCSI–2 cables to 25 meters (82 feet).

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

If you are daisy–chaining single–ended SCSI–2 devices together, use the following cables:

- 92222A cable with 0.5 meter (1.6 feet) length
- 92222B cable with 1.0 meter (3.3 feet) length
- 92222C cable with 2.0 meter (6.6 feet) length

If you are daisy–chaining fast differential or fast, wide SCSI–2 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

NOTICE: See "Determining SCSI–2 Bus Length" later in this appendix to determine the total length of your cables.

Connectors and Terminators

Any single–ended or fast differential SCSI–2 device connecting to the external system board connector must use a 50–pin high–density thumb screw connector (C2904A) on the end connecting to the system board or SCSI–2 bus, and a 50–pin low–density bail lock connector (K2291) on the other end. If you attach a second SCSI–2 device, the cable must have low–density connectors on the device end.

Any fast, wide SCSI–2 device connecting to the external system board connector or any fast differential device connecting to the EISA SCSI board must use a 68–pin high–density thumb screw connector (C2905A) on both ends.

The last device connected to the SCSI–2 bus must be terminated with a SCSI–2 terminator. All of the devices listed ship without terminators. If you do not already have a SCSI–2 terminator, you must order terminator K2291 (for single–ended 50–pin connectors) or C2905A (for fast differential or fast, wide 68–pin connectors) from Hewlett–Packard.

SCSI–2 Configuration Constraints

You are limited to the number of same–type SCSI–2 devices per system. Before adding another SCSI–2 device, determine if the system can support the additional device.

The Model 755 workstation offers the following three types of SCSI–2 bus, each with its own configuration constraints:

- Single–ended SCSI–2 bus (system card port – internal and external)
- Fast differential SCSI–2 bus (EISA option – external only)
- Fast, wide SCSI–2 bus (system card port – internal and external)

Single–Ended SCSI–2 Bus Configuration Constraints

For the single–ended SCSI–2 bus, HP–UX supports only **one** of each type of removable disk drive and **two** of the same type tape devices per system. Table C–3 shows configuration constraints for each single–ended SCSI–2 device type. If the system has internal hard disk drives, a floppy disk drive, a CD–ROM drive, or a DDS–format tape drive, you must count them as SCSI–2 devices.

Table C–3. Single–Ended SCSI–2 Bus Configuration Constraints

Single–Ended SCSI–2 Devices	Maximum Number of Each Type of Device Allowed
Hard Disk Drives (internal and external)	7
Floppy Disk Drives	1
CD–ROM Drives	1
4–mm DDS Tape Drives (one internal)	2
9–track Tape Drives	2
650–MB Magneto–Optical Drives	1
Magneto–Optical Autochangers (see notice below)	1
Maximum Number of SCSI–2 Devices	**7**

NOTICE: Magneto–Optical Autochangers use three SCSI–2 drive addresses. Each address must be accounted for in the maximum number of SCSI–2 devices allowed.

CAUTION: Do not mix single–ended, fast differential, and fast, wide SCSI–2 peripherals together on the same bus.

EISA Fast Differential SCSI–2 Configuration Constraints

Fast differential SCSI–2 does not work with the single–ended or fast, wide SCSI–2. Table C–4 shows the configuration constraints for each fast differential SCSI–2 device type. If any of the EISA slots contain networking boards, do not count these as SCSI–2 devices.

Table C–4. EISA Fast, Differential SCSI–2 Bus Configuration Constraints (per bus)

EISA Fast Differential SCSI–2 Devices	Maximum Number of Each Type of Device Allowed
SCSI–2 Drive (fast differential disk drives only)	7
SCSI–2 Disk Arrays (addressed as single drive)	7

NOTICE: See Appendix B of this guide for power constraints associated with EISA device cards.

CAUTION: Do not mix single–ended, fast differential, and fast, wide SCSI–2 peripherals together on the same bus.

Fast, Wide SCSI–2 Bus Configuration Constraints

Fast, wide SCSI–2 does not work with the single–ended or fast differential SCSI–2. Table C–5 shows the configuration constraints for each fast, wide SCSI–2 device type. If any of the EISA slots contain networking boards, do not count these as SCSI–2 devices.

Table C–5. Fast, Wide SCSI–2 Bus Configuration Constraints (per bus)

External Fast, Wide SCSI–2 Devices	Maximum Number of Each Type of Device Allowed
SCSI–2 Drive (fast, wide disk drives only)	15
SCSI–2 Disk Arrays (addressed as single drive)	7

NOTICE: See Appendix B of this guide for power constraints associated with EISA device cards.

CAUTION: **Do not** mix single–ended, fast differential, and fast, wide SCSI–2 peripherals together on the same bus.

Determining SCSI–2 Bus Length

This section helps you to determine the total length of the single–ended SCSI–2 bus, the fast, differential SCSI–2 bus (EISA option), and the fast, wide SCSI–2 bus.

Single–Ended SCSI–2 Bus Length

Follow these instructions to calculate your total single–ended SCSI–2 bus length (including the system unit, external SCSI–2 devices, and SCSI–2 interconnect cables) using Table C–6:

1. Find all of your external SCSI–2 devices in the first column. In the third column, write the SCSI–2 bus lengths (from the second column) that correspond to your devices.

NOTICE: In the third column, the length for the Model 755 System Unit is already listed. This number must always be used for the system unit whether or not it has internal drives installed.

2. In the fourth column, write down the lengths of the SCSI–2 interconnect cables you are using for your installation. (Cable lengths are listed in subsection "Cables" in the section on "SCSI–2 Restrictions.")

3. Add up all of the numbers in the third column and write that number on the subtotal line at the bottom of the column. Do the same for the fourth column.

4. Add the subtotals together and write the total in the *Total SCSI–2 Bus Length* box.

NOTICE: The total length of the single–ended SCSI–2 bus must not exceed 6 meters (19.6 feet). If the number you write for *Total SCSI–2 Bus Length* is greater than 6 meters (19.6 feet), try configuring your installation with shorter cables.

If you have problems, call your designated service representative.

Table C–6. SCSI–2 Bus Length Worksheet for Single–Ended Standard SCSI–2 Bus

SCSI–2 Device	Internal SCSI–2 Bus Length meters (feet)	Device Internal Length meters (feet)	External Cable Length meters (feet)
Model 755 System Unit	1.5 (4.9)	1.5 (4.9)	N/A
7980S	0.0 (0.0)	_____	_____
A1999A	0.3 (1.0)	_____	_____
C1520A	0.2 (0.7)	_____	_____
C1521A	0.2 (0.7)	_____	_____
C1700C	1.1 (3.6)	_____	_____
C1701C	0.3 (1.0)	_____	_____
C1704C	0.0 (0.0)	_____	_____
C1705C	0.0 (0.0)	_____	_____
C2213A	1.5 (4.9)	_____	_____
C2217T	1.3 (4.3)	_____	_____

Subtotals: _____ + _____

Total SCSI–2 Bus Length = ☐

(Total SCSI–2 bus length not to exceed total of 6 meters [19.6 feet])

EISA Fast Differential SCSI–2 Bus Length

Follow these instructions to calculate your total fast, differential SCSI–2 bus length for each EISA SCSI–2 bus on your system using Table C–7:

1. Find all of your external SCSI–2 devices in the first column. In the third column, write the SCSI–2 bus lengths (from the second column) that correspond to your devices.

2. In the fourth column, write down the lengths of the SCSI–2 interconnect cables you are using for your installation. (Cable lengths are listed in subsection "Cables" in the section on "SCSI–2 Restrictions.")

3. Add up all of the numbers in the third column and write that number on the subtotal line at the bottom of the column. Do the same for the fourth column.

4. Add the subtotals together and write the total in the *Total SCSI–2 Bus Length* box.

NOTICE: The total length of the EISA fast differential SCSI–2 bus must not exceed 25 meters (82 feet). If the number you write for *Total SCSI–2 Bus Length* is greater than 25 meters, try configuring your installation with shorter cables.

If you have problems, call your designated service representative.

Table C–7. SCSI–2 Bus Length Worksheet for EISA Fast Differential SCSI–2 Bus (per bus)

SCSI–2 Device	Internal SCSI–2 Bus Length meters (feet)	Device Internal Length meters (feet)	External Cable Length meters (feet)
C2427JK	0.7 (2.3)	_____	_____
C2425JK	0.7 (2.3)	_____	_____
C2482A	1.3 (4.3)	_____	_____

Subtotals: _____ + _____

Total SCSI–2 Bus Length = [ ]

(Total SCSI–2 bus length not to exceed total of 25 meters [82 feet])

Fast, Wide SCSI–2 Bus Length

Follow these instructions to calculate your total fast, wide SCSI–2 bus length for each fast, wide SCSI–2 bus on your system using Table C–8:

1. Find all of your external SCSI–2 devices in the first column. In the third column, write the SCSI–2 bus lengths (from the second column) that correspond to your devices.

2. In the fourth column, write down the lengths of the SCSI–2 interconnect cables you are using for your installation. (Cable lengths are listed in subsection "Cables" in the section on "SCSI–2 Restrictions.")

3. Add up all of the numbers in the third column and write that number on the subtotal line at the bottom of the column. Do the same for the fourth column.

4. Add the subtotals together and write the total in the *Total SCSI–2 Bus Length* box.

NOTICE: The total length of the fast, wide SCSI–2 bus must not exceed 25 meters (82 feet). If the number you write for *Total SCSI–2 Bus Length* is greater than 25 meters (82 feet), try configuring your installation with shorter cables.

If you have problems, call your designated service representative.

Table C–8. SCSI–2 Bus Length Worksheet for Fast, Wide SCSI–2 Bus (per bus)

SCSI–2 Device	Internal SCSI–2 Bus Length meters (feet)	Device Internal Length meters (feet)	External Cable Length meters (feet)
Model 755 System Unit	1.5 (4.9)	_____	N/A
C3034T	1.0 (3.3)	_____	_____
C3035T	1.0 (3.3)	_____	_____
C3036T	1.0 (3.3)	_____	_____

Subtotals: _____ + _____

Total SCSI–2 Bus Length = [ ]

(Total SCSI–2 bus length not to exceed total of 25 meters [82 feet])

Determining Existing SCSI Address Settings

Before installing any additional SCSI devices, you need to determine the existing SCSI address settings currently in use on your system. Perform the following steps:

1. Type the following in a terminal window or at the command line:

   ioscan Return

   After a few moments the **ioscan** utility lists all of the input and output devices it could find. The list should appear similar to the following:

```
H/W Path          Description       Status
-------------------------------------------------
0.0.0             graphics          ok(0x577)
2.0.1             scsi              ok(0x7071)
2.0.1.0.0         disk              ok(0x800101)
2.0.1.5.0         disk              ok(0x202)
2.0.1.6.0         disk              ok(0x202)
```

2. To find out which SCSI–2 address settings are currently in use, look under the **H/W Path** heading. The listing **2.0.1 scsi** is the built–in SCSI–2 bus controller. For devices connected to the built–in SCSI–2 bus, such as disks, the fourth number is the SCSI–2 address setting for that device. For example, the listing **2.0.1.6.0** in the sample device list tells us that there is a SCSI device (a disk) currently using address 6 on the built–in SCSI–2 bus.

3. Determine the SCSI–2 device ID of any internal drives.

4. Determine the SCSI–2 device ID for each type of external single–ended drive currently connected to your workstation.

NOTICE: The C1700A Magneto–Optical Autochanger uses three SCSI–2 addresses, and accounts for three of the seven devices allowed on the SCSI–2 bus.

Assigning SCSI–2 Device IDs

The Model 755 has three different SCSI–2 buses available: a single–ended SCSI–2 bus (system card SCSI–2 port), a fast differential SCSI–2 bus (EISA option), and a fast, wide SCSI–2 bus (system card SCSI–2 port).

Single–Ended SCSI–2 Device IDs

Before assigning a SCSI–2 device ID to your drive, you need to check your SCSI–2 device IDs. To check what SCSI–2 device IDs are available and assign an ID to your device, follow these instructions, using Table C–9:

1. Write in the SCSI–2 device ID of any internal drives in Table C–9.

2. 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–2 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–2 addresses, and accounts for three of the seven devices allowed on the SCSI–2 bus.

4. Check to see what SCSI–2 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–2 device ID to your drive. Refer to the drive's installation documentation for information on changing the device ID. Refer to Table C–2 for priorities associated with device IDs and addresses.

CAUTION: **Do not** use SCSI–2 device ID 7 for any device. It is reserved for the system host adaptor.

Table C–9. Single–Ended SCSI–2 Device IDs

SCSI–2 Device Drives	**Device ID (Address) Number (Only 0 through 6 Available)**	
	Internal	**External**
Internal System Drives:		
System SCSI–2 Drive(s)		
1st Winchester Drive (if present, uses ID No. 6)	_____	N/A
2nd Winchester Drive (if present, uses ID No. 5)	_____	N/A
Floppy Disk Drive (if present, uses ID No. 0)	_____	N/A
CD–ROM Drive (if present, uses ID No. 2)	_____	N/A
4–mm DDS Tape Drive (if present, uses ID No. 1)	_____	N/A
External Device Drives:		
1st External Device _____	N/A	_____
2nd External Device _____	N/A	_____
3rd External Device _____	N/A	_____
4th External Device _____	N/A	_____
5th External Device _____	N/A	_____
6th External Device _____	N/A	_____
7th External Device _____	N/A	_____

NOTICE: You can have no more than 7 SCSI–2 devices (internal and external) connected to the system.

EISA Fast Differential SCSI–2 Device IDs

Before assigning a SCSI–2 device ID to your drive, you need to check your SCSI–2 device IDs. To check which SCSI–2 device IDs are available and assign an ID to your device, follow these instructions which use Table C–10:

1. Write in the type of external fast differential drives currently connected to your system under the heading "EISA Fast Differential SCSI–2 Device Drives" and each drive's SCSI–2 device ID under the heading "Device ID."

NOTICE: If you don't know the device IDs of your drive(s), check the address jumpers or switches on each device for its address setting.

If any of the EISA slots contain networking boards, do not count these as SCSI–2 devices.

2. Add your new drive to the table.

3. Check to see what SCSI–2 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–2 device ID to your drive. Refer to the drive's installation documentation for information on changing the device ID. Refer to Table C–2 for priorities associated with device IDs and addresses.

CAUTION: **Do not** use SCSI–2 device ID 7 for any device. It is reserved for the system host adaptor.

Table C–10. EISA Fast Differential SCSI–2 Device IDs (per bus)

EISA Fast Differential SCSI–2 Device Drives		**Device ID (Address) Number (Only 0 through 6 Available)**
1st External Device	_____	_____
2nd External Device	_____	_____
3rd External Device	_____	_____
4th External Device	_____	_____
5th External Device	_____	_____
6th External Device	_____	_____
7th External Device	_____	_____

NOTICE: You can have no more than 7 SCSI–2 devices connected to an EISA bus.

Fast, Wide SCSI–2 Device IDs

Before assigning a SCSI–2 device ID to your drive, you need to check your SCSI–2 device IDs. To check which SCSI–2 device IDs are available and assign an ID to your device, follow these instructions which use Table C–11:

1. Write in the type of external drives currently connected to your system under the heading "Fast, Wide SCSI–2 Device Drives" and each drive's SCSI–2 device ID under the heading "Device ID."

NOTICE: If you don't know the device IDs of your drive(s), check the address jumpers or switches on each device for its address setting.

If any of the EISA slots contain networking boards, do not count these as SCSI–2 devices.

2. Add your new drive to the table.

3. Check to see what SCSI–2 device IDs are not used. You may use ID numbers 0 through 14 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–2 device ID to your drive. Refer to the drive's installation documentation for information on changing the device ID. Refer to Table C–2 for priorities associated with device IDs and addresses.

CAUTION: **Do not** use SCSI–2 device ID 15 for any device. It is reserved for the system host adaptor.

Table C–11. Fast, Wide SCSI–2 Device IDs (per bus)

Fast, Wide SCSI–2 Device Drives	Device ID (Address) Number (ID 7 not available)
1st External Device _____	_____
2nd External Device _____	_____
3rd External Device _____	_____
4th External Device _____	_____
5th External Device _____	_____
6th External Device _____	_____
7th External Device _____	_____
8th External Device _____	_____
9th External Device _____	_____
10th External Device _____	_____
11th External Device _____	_____
12th External Device _____	_____
13th External Device _____	_____
14th External Device _____	_____
15th External Device _____	_____

NOTICE: You can have no more than 15 SCSI–2 devices connected to a fast, wide bus.

Connecting to the SCSI–2 Port

This section describes how to connect to the single–ended SCSI–2 port, any EISA SCSI–2 port(s), and the fast, wide port.

Single–Ended SCSI–2 Port Connection

You can identify the single–ended SCSI–2 port by its high–density connector. A SCSI–2 cable connects to this port with a high–density thumb screw connector, as shown in Figure C–1.

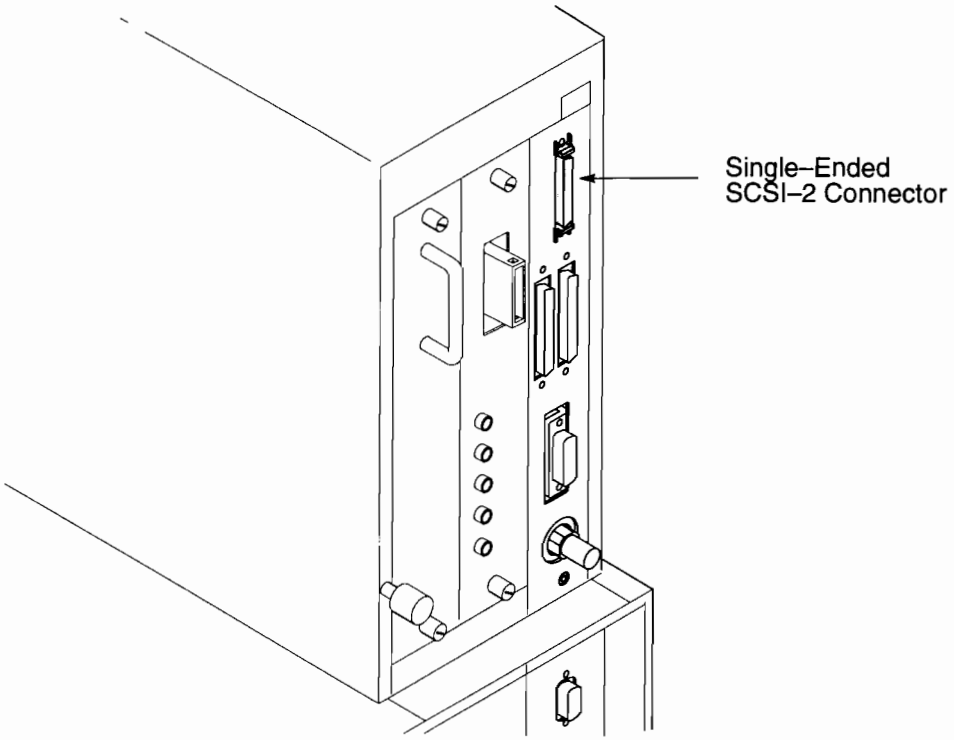


Figure C–1. Connecting to the Single–Ended SCSI–2 Port

NOTICE: The last device connected to the single–ended SCSI–2 bus must be terminated with a SCSI–2 terminator. All devices listed ship without terminators. If you do not already have a SCSI–2 terminator, you must order a terminator from Hewlett–Packard. See "Connectors and Terminators" earlier in this appendix for more information.

EISA Fast Differential SCSI–2 Port Connection

The EISA fast differential SCSI–2 ports are located in the 4–slot EISA backplane. A SCSI–2 cable connects to this port with a high–density thumb screw connector, as shown in Figure C–2.

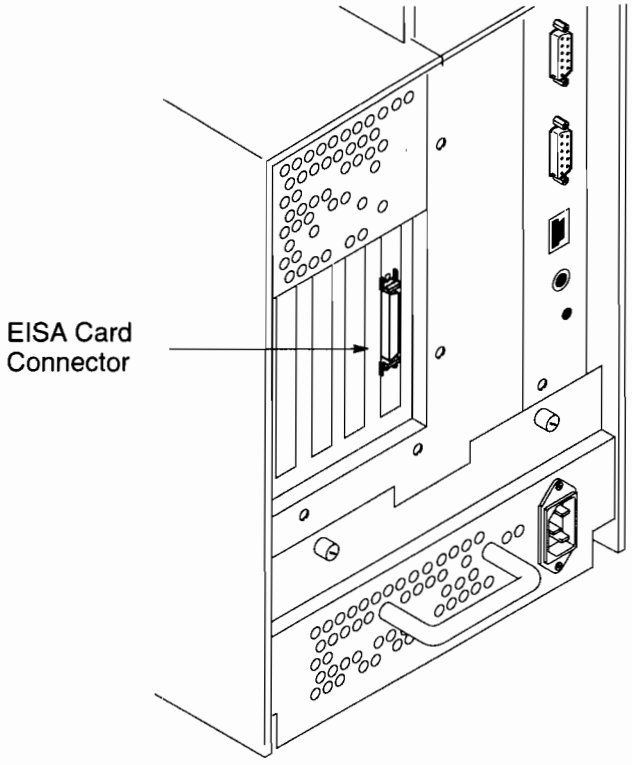


Figure C–2. Connecting to the EISA SCSI–2 Port(s)

NOTICE: The last device connected to the EISA fast differential SCSI–2 bus must be terminated with a SCSI–2 terminator. All devices listed ship without terminators. If you do not already have a SCSI–2 terminator, you must order a terminator from Hewlett–Packard. See "Connectors and Terminators" earlier in this appendix for more information.

Fast, Wide SCSI–2 Port Connections

The ports for both internal and external fast, wide SCSI–2 are shown in Figure C–3.

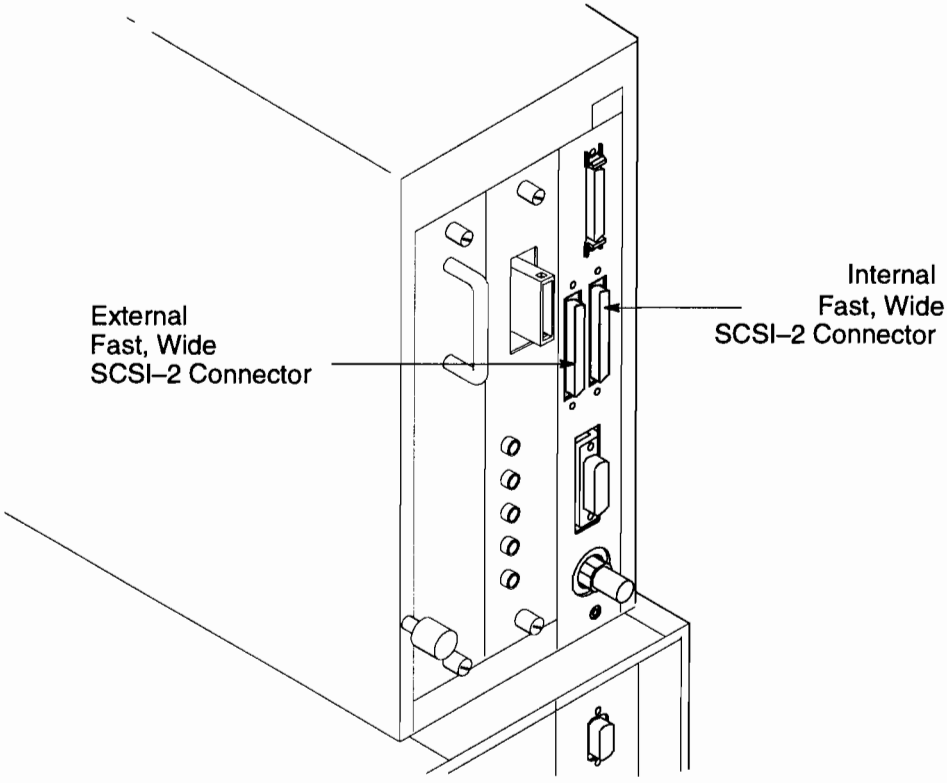


Figure C–3. Connecting to the Fast, Wide SCSI–2 Port(s)

NOTICE: The last device connected to the fast, wide SCSI–2 bus must be terminated with a SCSI–2 terminator. All devices listed ship without terminators. If you do not already have a SCSI–2 terminator, you must order a terminator from Hewlett–Packard. See "Connectors and Terminators" earlier in this appendix for more information.

Appendix D
The Boot Console User Interface

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 **boot console user interface** to allow you to perform special tasks, display information, and set certain system parameters, even if the operating system is unavailable.

Here are the special tasks that you can perform:

- Boot your workstation from any specified hardware device.
- Search for hardware devices that contain media from which your workstation can be booted.
- Reset the workstation.

Here are some of the kinds of information that your system displays:

- A list of the commands you may issue from the boot console user interface
- The primary boot path
- The console path
- The real–time clock's time and date
- The settings of the Autoselect flag
- The status (on or off) of the secure boot mode
- The status (on or off) of the **fastboot** memory test
- The station address for the built–in LAN and FDDI interfaces

Here are some of the system parameters that you can set:

- The primary boot path
- The console path
- The real–time clock's time and date
- The Autoselect flag
- The status (on or off) of the secure boot mode
- The status (on or off) of the **fastboot** memory test

Accessing the Boot Console User Interface

To use the boot console user interface, follow these steps:

1. Shut down your workstation as described in Chapter 2 or Chapter 3.

2. Turn off the power to your workstation for a few seconds. Then turn it back on.

CAUTION: **Do not** power off your workstation without first shutting down HP–UX. Powering off with HP–UX still running could damage the data on the disks associated with your workstation.

3. Turn the power back on.

   The system self–test runs automatically. Within a few minutes a message displays. Press and hold the Esc key as soon as this message appears:

```
Selecting a system to boot.
To stop selection process, press and hold the ESCAPE
key.
```

4. Release Esc as soon as the following message displays:

```
Selection process stopped.
```

   A short time later, this message appears:

```
Searching for potential boot devices. To terminate
search, press and hold the ESCAPE key.

Device Selection   Device Path    Device Type
-----------------------------------------------
```

Your workstation is now searching for devices that may hold file systems from which it can boot HP–UX. As they are found, they appear in a list similar to the following example:

```
P0          scsi.6.0          QUANTUM LPS525S
P1          scsi.5.0          QUANTUM LPS525S
P2          scsi.2.0          TOSHIBA CD-ROM DRIVE:XM
```

This process may take several minutes. When the search ends, this list of actions appears:

```
b)  Boot from specified device
s)  Search for bootable devices
a)  Enter boot administration mode
x)  Exit and continue boot sequence
?)  Help

Select from menu:
```

This is the **boot console user interface menu**.

If your workstation is a member of a **cluster** (a group of computers that share the file system of a **host** by means of a network connection), there may be no disks listed because your workstation has no disks directly attached to it.

Entering the Boot Administration Mode

To change system hardware parameters, you must enter the boot administration mode. From within this mode, you may enter any of the commands used in the task descriptions that follow.

To enter the boot administration mode, type **a** at the menu prompt as shown:

```
Select from menu: a Return
```

The following prompt is displayed:

```
BOOT_ADMIN>
```

Getting Help for the Boot Console User Interface Commands

You may issue many different commands in the boot administration mode. For a complete listing, at the BOOT_ADMIN> prompt type **h**, **help**, or **?** and a summary of all of the commands is listed.

To get help for a particular command, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> help command_name Return
```

where *command_name* is the name of one of the listed commands.

The displayed help information usually includes a description of the command, its options, and the format for parameters.

Booting the Workstation

Usually, you start your workstation by turning it on and waiting for HP–UX to boot automatically. However, you may not 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, type the following at the `BOOT_ADMIN>` prompt:

  `BOOT_ADMIN>` **boot** *device* Return

  where *device* is one of the following:

  - The **hardware path** to the device, specified in Mnemonic Style Notation (see Table D–2 on page D–12)

  - The **P***n* designation of the device, as listed in the device search

  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 "scsi.1.0" and is designated by the search as device "P2", type one of the following commands at the `BOOT_ADMIN>` prompt:

  `BOOT_ADMIN>` **boot scsi.1.0** Return

  or

  `BOOT_ADMIN>` **boot P2** Return

  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, type the following at the BOOT_ADMIN> prompt:

  BOOT_ADMIN> **boot** *device* **isl** Return

  This 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.

  For example, if the usual kernel (**/hp–ux**) on your root disk (**scsi.6.0**) has become corrupted, and you wish to boot your workstation from the backup kernel (**/SYSBCKUP**), type the following at the ISL> prompt:

  ISL> **hpux boot disk(scsi.6;0)/SYSBCKUP** Return

- If you do not know the locations of the bootable operating systems on the various media in your file system, you can find them with the **search** command.

NOTICE: You may also boot the workstation from the main menu of the Boot Console User Interface by using a command in this form:

Select from menu: **b** *device_path* Return

where *device_path* is a designator for the path to the device that contains a bootable file system.

Searching for Bootable Media

The initial search conducted by the boot console user interface locates devices that *might* contain bootable media. This search might find a DDS–format tape drive which actually does not contain a bootable tape. To check to see which devices actually contain bootable media, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> search Return
```

This causes your workstation to search *exhaustively* for bootable media. It searches all types of I/O devices in the following order:

1. Built–in SCSI
2. Built–in FWSCSI
3. Built–in LAN
4. EISA (if installed)

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 using the following control sequences:

- To hold the display temporarily, press Ctrl S.
- To continue the display, press Ctrl Q.
- To halt the search, press Esc.

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.

NOTICE: If the search discovers ten devices, the label in the **Device Selection** column for the tenth entry is labeled **P9**. Any subsequent entries are labeled **P***.

P* cannot be used as a device designator for boot administration commands because it is ambiguous. To refer to a device labeled **P*** in a search, specify it by means of the entry in the **Device Path** column.

To search to see which devices of *just one type* actually contain bootable media, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> search device_type Return
```

where *device_type* is one of the following:

scsi is the built–in single–ended SCSI bus

fwscsi is the built–in fast/wide SCSI bus

lan is all connections to the built–in LAN

eisa is an optional EISA device

NOTICE: You may also search for bootable media from the main menu of the Boot Console User Interface by using a command in one of the following forms:

```
Select from menu: s Return
```

```
Select from menu: s device_type Return
```

where *device_type* is the type of device (**scsi, fwscsi, lan,** or **eisa**) for which you wish to search.

Redisplaying the Results of a Search

The list of bootable devices is stored until you conduct another search or you reboot your system. To see the list of devices again, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> show Return
```

It is much faster to redisplay the list with **show** than it is to conduct the search again.

Resetting the Workstation

The act of resetting your workstation causes it to restart completely. It's similar to turning the workstation off and then back on again. To reset your workstation, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> reset Return
```

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 can set any of the paths shown in Table D–1:

Table D–1. System Paths

Path Type	Device
primary or **pri**	Your workstation's default boot device (usually the root disk)
alternate or **alt**	Your workstation's alternate boot device (usually a DDS–format tape device)
console or **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 BOOT_ADMIN> prompt:

```
BOOT_ADMIN> path Return
```

The paths are displayed in **Mnemonic Style Notation** as shown in Table D–2.

Table D–2. Mnemonic Style Notation

I/O Type	Specification Format
Built–in SCSI	**scsi**.*scsi_address.logical_unit_number*
Built–in FWSCSI	**fwscsi**.fw*scsi_address.logical_unit_number*
Built–in LAN	**lan**.*server_address.init_retry.io_retry*
Built–in HIL	**hil**
RS–232 Port A	**rs232_a**.*baud_rate.word_length.parity_option*
RS–232 Port B	**rs232_b**.*baud_rate.word_length.parity_option*
Graphics Slot	**graphics**
Built–in Parallel Port	**parallel**
EISA	**eisa**.*eisa_slot.scsi_address* (for EISA SCSI)

To display the current setting for a particular system path, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> path path_type Return
```

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

For example, to get the path to the primary boot device, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> path primary Return
```

To set a system path to a new value, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> path path_type path Return
```

where *path_type* is one of the path types listed in Table D–1 and *path* is the specification of the path in Mnemonic Style Notation (as described in Table D–2). For example, to set the console path to RS–232 Port A with a baud rate of 4800, a word length of 7, and even parity, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> path console rs232_a.4800.7.even Return
```

For help in using the **path** command, type one of the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> help path Return

BOOT_ADMIN> help path_type Return
```

where *path_type* is one of the path types listed in D–1. The help screens offer complete descriptions of all path options.

Displaying and Setting the Real–Time Clock

It is usually a good idea to set the real–time clock in your workstation with the HP–UX **date** command, since that command contains special safeguards that can help you to avoid disruption of time–related processes (like those controlled by the **cron** command). But you may also set the clock from within the boot administration mode.

To display the current setting of the real–time clock, type the following at the `BOOT_ADMIN>` prompt:

```
BOOT_ADMIN> date Return
```

Your workstation reports the information in this form:

```
Mon Jul 1 14:55:05 GMT (19:91:7:1:14:44:5)
```

To set the real–time clock, type the following at the `BOOT_ADMIN>` prompt:

`BOOT_ADMIN>` **date** *century*:*year*:*month*:*day*:*hour*:*minute*:*second* Return

For example, to set the clock to July 1, 1991, 2:44:05 PM, GMT, type the following at the `BOOT_ADMIN>` prompt:

`BOOT_ADMIN>` **date 19:91:7:1:14:44:5** Return

NOTICE: The boot administration mode's **date** command only understands Greenwich Mean Time (GMT). You must compute GMT relative to your own time zone to get the correct value for *hours* (and, in some time zones, *minutes*).

Displaying and Setting the Autoselect Flag

Autoselect is a variable stored in your workstation's 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.

To examine the state of the **Autoselect** flag, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> auto Return
```

If **Autoselect** is set to **on**, when your workstation is turned on, it automatically attempts to boot the operating system. If it is set to **off**, your workstation enters the boot console user interface and a search for all potential bootable devices takes place.

To change the state of the **Autoselect** flag, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> autoselect state Return
```

where *state* is **on** or **off**.

Displaying and Setting the Secure Boot Mode

There may be circumstances in which you would not wish to allow anyone to attempt to boot your workstation from a device other than the device you have specified, nor to control the system from any console other than the one you have designated. This can be an important consideration in secure installations.

If you set up your system in such a way that it is physically impossible for unauthorized persons to disconnect it from its designated boot device, you can guarantee that the boot console user interface cannot be used to boot the system from an unauthorized device or to change the console path. If the secure boot mode is set to **on**, the boot console interface cannot be activated; thus, you are assured that your system's security cannot be compromised through interaction with that interface.

To check the status of the secure boot mode, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> secure Return
```

The value **on** or **off** is displayed.

To change the value of the secure boot mode, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> secure state Return
```

where *state* is **on** or **off**.

CAUTION: Once the secure boot mode is set to **on**, the only way to turn it off is to disconnect the boot device. When you turn on your workstation after isolating it from its boot device, the boot console interface reappears. You can then turn the secure boot mode **off**, turn off your workstation, reconnect the boot device, and turn the system back on.

Displaying and Setting the Fastboot Mode

When **fastboot** is enabled (set to **on**), your workstation does a quick check of the memory 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**).

When **fastboot** is disabled (set to **off**), more extensive memory testing is performed during the self tests causing the boot process to take significantly longer

If you are experiencing difficulty in booting your workstation, set **fastboot** to **off** and reboot the system. The more extensive memory testing may reveal the error condition.

If your workstation has a large amount of memory installed, the power–on tests may take several minutes to complete with **fastboot** set to **off**.

To display the status of **fastboot**, type the following at the `BOOT_ADMIN>` prompt:

```
BOOT_ADMIN> fastboot Return
```

To disable **fastboot**, type the following at the `BOOT_ADMIN>` prompt:

```
BOOT_ADMIN> fastboot off Return
```

To enable **fastboot**, type the following at the `BOOT_ADMIN>` prompt:

```
BOOT_ADMIN> fastboot on Return
```

Displaying the LAN Station Address

The **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). It is sometimes necessary for you to supply this address 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.

To display your workstation's LAN station address, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> lan_addr Return
```

The LAN station address is displayed as a twelve–digit number in hexadecimal notation, similar to the following:

```
LAN Station Address:  123456-789abc
```

Displaying the FDDI Station Address

The **FDDI station address** of your workstation is the label that uniquely identifies the FDDI connection for your workstation at the **link level** (the hardware level). It is sometimes necessary for you to supply this address to other users. For example, if your workstation is to become a member of a cluster, the cluster administrator needs to know your FDDI station address in order to add your workstation to the cluster.

To display your workstation's FDDI station address, type the following at the BOOT_ADMIN> prompt:

```
BOOT_ADMIN> fddi_addr Return
```

The FDDI station address is displayed as a twelve–digit number in hexadecimal notation, similar to the following:

```
FDDI Station Address:  cba987-654321
```

Exiting the Boot Administration Mode

To exit the boot administration mode, take one of the following actions, depending on your need:

- Type **exit** at the `BOOT_ADMIN>` prompt. This returns you to the boot console user interface menu.
- Type **reset**. This restarts the workstation.
- Issue a **boot** command. See the section "Booting the Workstation," earlier in this appendix, for details.
- Turn off the workstation. There is no need to shut down the workstation with the special procedure described in Chapter 2 or Chapter 3, since the workstation has not yet been booted, and the file system has not been activated.

Glossary

absolute pathname

The full pathname of a file, including all the directories leading to it, starting with the root directory ("/") and ending with the filename itself. *See also* **file, filename, pathname**.

access permissions

Settings which allow a user or group of users to read, write, or execute files. *See also* **file access permissions**.

active window

Window which 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 which identifies the file or directory to be acted on.

attachment unit interface (AUI)

A transceiver cable that conforms to IEEE 802.3 specifications.

back up

v. To make a copy of the file system on a tape or disk that can be stored separately from the original files. Also called "backing up the system" or simply "system backup."

bitmap

Generally speaking, an array of data bits used for graphic images. Strictly speaking, a pixmap of depth one, capable of representing 2–color images.

boot

Short for bootstrap service. A service provided by a short program, stored in the read–only memory of your workstation, that loads the operating system (or any complex program) into main memory. Partner workstations provide bootstrap service to diskless workstations.

See also **boot ROM**.

boot console user interface

The interactive program that enables you to interact with the hardware of your workstation before the workstation boots the operating system. The boot console user interface allows you to perform special tasks, display information, and set certain system parameters.

boot ROM

A read–only memory that is incorporated into a workstation for the purpose of starting the operating system, testing the terminal, and producing a standard display.

bootstrap service

See **boot**.

byte

A fundamental character–code unit, usually consisting of 8 bits.

CD–ROM

Compact Disc Read–Only Memory. *See also* **CD–ROM disc**, **CD–ROM drive**.

CD–ROM disc

CD–ROM discs are identical to the audio compact discs (CDs) used to record stereo music, except that they store data. CD–ROM discs are 120 mm (4.7 inches) in diameter, and use one data surface with a capacity of 600 MB. The data surface contains pits and flat spots arranged in a continuous spiral track, which is read at a constant speed.

CD–ROM drive

A random–access, read–only, mass–storage device that uses removable CD–ROM discs. The drive contains a semiconductor laser for reading data optically and an embedded controller with a SCSI interface.

Central Processing Unit (CPU)

The part of a workstation that interprets and executes instructions.

child directory

See **subdirectory**.

click

To press *and release* a mouse button. The term comes from the fact that pressing and releasing most mouse buttons makes a clicking sound.

cluster

A group of workstations connected via a Local Area Network (LAN). One workstation, the cluster server, performs as a file–system server for the cluster clients. *See also* **cluster client, cluster node, cluster server**.

cluster client

A cluster node that does not have a local HP–UX file system. Its file system resides on the cluster server. *See also* **cluster, cluster node, cluster server**.

cluster node

A member of a group of workstations connected via a Local Area Network (LAN). One workstation, the cluster server, performs as a server to the cluster. *See also* **cluster, cluster client, cluster server**.

cluster server

A workstation which 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**.

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 which 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.

console user interface menu

A list of the actions you can perform from the boot console user interface. *See also* **boot console user interface**.

control key sequence

A keystroke combination used as a shorthand way of specifying commands. To enter a control key sequence, you hold down the control key while pressing another key.

cpu

See **Central Processing Unit.**

current directory

See **current working directory**.

current session

The work and processes that have been created since you logged into the system (and before you log out again). *See also* **session**.

current working directory

The directory in which a relative path name search begins, as well as the directory in which you are currently working. It is also called the working directory or current directory.

cursor

The small blinking box displayed in whatever screen is active at a particular time. The cursor marks your current typing position on the screen and indicates which program (HP VUE terminal window or shell) will receive your commands.

daisy–chaining

Method of connecting devices where the signal passes from one device to the next in serial fashion along a bus.

DDS–format tape drive

Device which stores data on Digital Data Storage (DDS) cassettes.

default

Most commands give you a choice of one or more options. If you don't specify an option, the command automatically assigns one. This automatic option is called the default. *See also* **command option**.

dialog box

A special type of HP VUE screen that is called by the user from a window. Dialog boxes contain controls and settings. To display an example of a dialog box, click the Style Manager button on the Workspace, then click on Color.

directory

A special type of object that contains information about the objects beneath it in the HP–UX organizational structure. Basically, it is a file that stores names and links to files and other directories. *See also* **file**.

disk

A thin, round plate with a magnetic surface coating on which data is stored by magnetic recording. *See also* **floppy diskette, hard disk, CD–ROM disc**.

disked workstation

A workstation that has its own hard disk drive. *See also* **diskless workstation, node, partner node, workstation**.

diskette

See **floppy diskette**.

diskless booting

Loading the operating system into local memory from the disk of a partner workstation.

diskless workstation

A workstation that has no disk. A diskless workstation can use the disk of its partner workstation or other workstations. If necessary, it can also use the computational services of the partner workstation or other workstations. A diskless workstation boots from its partner workstation. *See also* **disked workstation, node, partner node, workstation**.

double click

Pressing and releasing a mouse button twice in rapid succession.

drag

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–format tape drive, floppy drive, hard disk drive**.

drop

Release an icon that has been "dragged" to a new position. *See also* **drag**.

environment

The conditions under which your commands are executed. These conditions include your workstation characteristics, home directory, and default search paths. *See also* **environment variables**.

environment variables

The set of defined shell variables (some of which are PATH, TERM, SHELL, EXINIT, HOME) that define the conditions under which your commands are executed. These conditions include your workstation characteristics, home directory, and default search paths. *See also* **environment**.

ETHERNET

The LAN developed jointly by Digital Equipment Corporation, Intel, and Xerox Corporation, upon which the IEEE 802.3 network is based.

Extended Industry Standard Architecture (EISA)

An industry standard bus architecture based on and compatible with that used by IBM in their AT series computers.

fast differential SCSI–2

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 differential SCSI–2, single–ended standard SCSI–2, Small Computer System Interface.**

fast wide differential SCSI–2

A 16–bit wide bus with high–power receivers and drivers, which allows cable length of up to 25 meters and a speed of up to 10 MB per second. *See also* **fast differential SCSI–2, single–ended standard SCSI–2, 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.

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.

filename

The name given to a particular file. *See also* **absolute pathname**, **file**, **pathname**.

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

Device which stores data on a flexible diskette.

hard disk

Type of disk which is rigid as opposed to floppy diskette which is flexible.

hard disk drive

Device which stores data on a hard disk. The hard disk is a permanent part of the drive and cannot be removed.

Help Manager

The HP VUE application that provides online help.

$HOME

The environment variable representing the home directory. This is the directory in which you are placed after you log in. Typically, this is `/users/`*login*, where *login* is your username. *See also* **home directory**.

home directory

A shorthand way of referring to a frequently used directory, almost always the login directory.

host

See **cluster server**.

host name

See **internet protocol address**.

HP–UX cluster

See **cluster node** and **cluster server**.

HP Visual User Environment

A user interface. It draws a graphical layer over the complexities of the other layers of the system (the hardware, operating system, and X Window system), enabling you to control your workstation by directly manipulating graphical objects instead of by typing commands at a command–line prompt.

HP VUE

See **HP Visual User Environment**.

icon

A small, graphic representation of an object. Objects can be "iconized" (turned into icons) to clear a cluttered workspace. Icons can be restored to their original appearance when needed. Whatever processes are executing in an object continue to execute when the object is iconized.

iconify

See **iconize**.

iconize

To turn a window or shell into an icon. *See also* **icon**.

Initial System Loader

The program that actually controls the loading of the operating system.

input device

Any of several pieces of hardware equipment used to give information to a system. Examples are the keyboard and the mouse. *See also* **output device**.

input window

The window that displays a program's prompt and any commands typed but not yet executed.

internet protocol address (IP address)

A string of characters that uniquely identifies a workstation in a network. Also referred to as the IP address, the system name, and the host name.

invisible filename

A filename in which the first character is a dot (.). Invisible filenames are not displayed by the listing commands such as **ls** and **ll** without add options, such as **–a**.

IP address

See **internet protocol address**.

ISL

See **Initial System Loader**.

kernel

The part of the operating system that is an executable piece of code responsible for managing the computer's resources. The kernel controls the rest of the operating system.

LAN

See **local area network**.

LAN station address

See **local area network station address**.

link

n. 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 which share data, hardware, and software resources via Networking Services software.

local area network station address

The label that uniquely identifies the local area network (LAN) connection for your workstation at the hardware level.

log in

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, accepts the user's username and password, and then starts the Session Manager.

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 which contains other directories, each of which is then called a subdirectory. *See also* **subdirectory**.

partner node

A workstation that shares its disk with a diskless node. *See also* **diskless workstation**.

password

The word you enter next to the password prompt at login time. Keep your password secret and change it occasionally in order to protect your account from unauthorized use. *See also* **user account**.

path

The hardware address of a device that is attached to the I/O system of your workstation.

pathname

A series of names separated by slashes that describe the path of the operating system from some starting point in the network to a destination object. Pathnames begin with the name of the starting point, and include every directory name between the starting point and the destination object. A pathname ends with the name of the destination object. *See also* **name, object**.

permissions

A set of rights (read, write, execute) associated with an object in the file system. Determines who may use the object.

PID

Process Identification. Also referred to as a process ID. *See also* **process ID**.

pointer

Sometimes called the "mouse pointer," the pointer shows the mouse location on the screen. The pointer's shape depends on its location. In the HP VUE Workspace, the pointer is an X. On a window frame, the pointer is an arrow.

process

A computing environment in which you may execute programs; a program currently running in the system.

process ID

A unique identification number assigned to all processes by the operating system. Also referred to as a PID. *See also* **PID**.

program

A unit of executable code, in binary or "source" form. Most HP–UX commands and routines consist of programs.

prompt

A message or symbol displayed by the system to let you know that it is ready for your input.

push button

A graphic control that simulates a real–life push button. Use the pointer and mouse to push the button and immediately start an action.

RAM

Random access memory.

ROM

Read–only memory.

root

See **superuser**.

scroll bar

A vertical or horizontal bar located on the side or bottom of a window which allows the user to view information which does not fit within the window.

SCSI–2

See **Small Computer System Interface**.

server

A program that controls all access to input and output devices.

session

The time between when you log in and when you log out. Also called a work session or a login session. *See also* **current session**.

shell

A command–line interpreter program used to invoke utility programs. Some examples of HP–UX shells are the Bourne, Korn, Key, and C shells. Sometimes referred to as a command interpreter. See also **command interpreter**.

shell command

An instruction you give the system to execute a utility program or shell script. *See also* **shell script, utility program**.

shell script

A file that contains commands that the system can interpret and run in a shell.

shutdown

The process of taking the system from multi–user state to system administration state.

SIMM

See **Single In–line Memory Module**

Single–ended standard SCSI–2

An 8–bit wide SCSI bus with standard receivers and drivers, which limits total cable length to 6 meters. *See also* **fast differential SCSI–2, fast wide differential SCSI–2, Small Computer System Interface**.

Single In–line Memory Module

A memory board.

slider

One of the components of a scroll bar. The slider is the object that is dragged along the scroll area to cause a change.

Small Computer System Interface (SCSI)

An IEEE standard for interfacing a computer to multiple, disparate high–speed peripherals such as a floppy disk or a CD–ROM, singly or in combination. *See also* **fast differential SCSI–2, fast wide differential SCSI–2, SCSI–2.**

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.

system administrator

The person responsible for system and network installation, updating, maintenance, and security at your site.

system call

Invocation of a kernel process by a user program.

system name

See **internet protocol address.**

terminal window

A terminal window is a type of HP VUE window that emulates a complete display terminal. Terminal windows are typically used to fool non–client programs into believing they are running in their favorite terminal. When not running programs or executing operating system commands, terminal windows display the command–line prompt. *See also* **HP Visual User Environment**.

title bar

The rectangular area between the top of the window and the window frame, that contains the title of the window object.

transceiver

A device that transmits and receives signals.

user account

The system administrator defines a user account for every person authorized to use the system. Each user account contains the name the computer uses to identify the person (user ID), and the person's password. User accounts also contain project and organization names, to help the system determine who can use the system and what resources each person or organization can use. *See also* **user ID** and **password**.

user ID

The name the computer uses to identify you. Your system administrator assigns you a user ID. Enter your user ID during the login procedure when the system displays the login prompt. *See also* **user account**.

username

The name that the system recognizes as uniquely yours. Also known as your login name. The username is also the name that identifies you to the mail system and other software requiring secure entry.

utility

See **utility program**.

utility program

A program provided with the operating system to perform a frequently required task, such as printing a file or displaying the contents of a directory. *See also* **command, shell command**.

window

A rectangular area of the screen for viewing information. HP VUE allows you to create several types of windows on the screen. Each window is a separate computing environment in which you may execute programs, edit text, or read text. *See also* **Workspace Manager**.

Window Manager

The HP VUE program that controls the size, placement, and operation of windows.

working directory

See **current working directory**.

Workspace

What the screen becomes when you start HP VUE. Although you can hide the workspace under terminal windows or other graphic objects, you can never position anything behind the workspace. All windows and graphic objects appear stacked on the workspace. *See also* **HP Visual User Environment, terminal window**.

Workspace Manager

The program that controls the size, placement, and operation of windows on the HP VUE Workspace. The Workspace Manager is a special Window Manager. *See also* **Window Manager**.

workstation

A compact, graphics–oriented computer having high speed and high memory capacity. A workstation usually includes a keyboard, a monitor, and a system unit. *See also* **node, disked workstation, diskless workstation**.

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Reader's Response

Please take a few minutes to give us the information we need to revise and improve our manuals from your point of view.

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Order No.: A2288-90600
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