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# Important Information About Clearing Power-On and Setup Passwords

The information in this card supersedes the sections, "Clearing a Power-On Password" and "Clearing a Setup Password" in Chapter 3, "Security Features," in the *Compaq Professional Workstation 5100 Reference Guide.*

Clearing a Power-On or Setup Password

To clear (erase) the Power-On or Setup Password, follow these steps:

1. Turn off the workstation. Disconnect the power cord from the grounded AC outlet and from the power connector on the rear of the workstation.

2. Remove the following components:

    ❏ workstation cover

    ❏ expansion board bracket

3. Locate the SW1 switch on the system board.
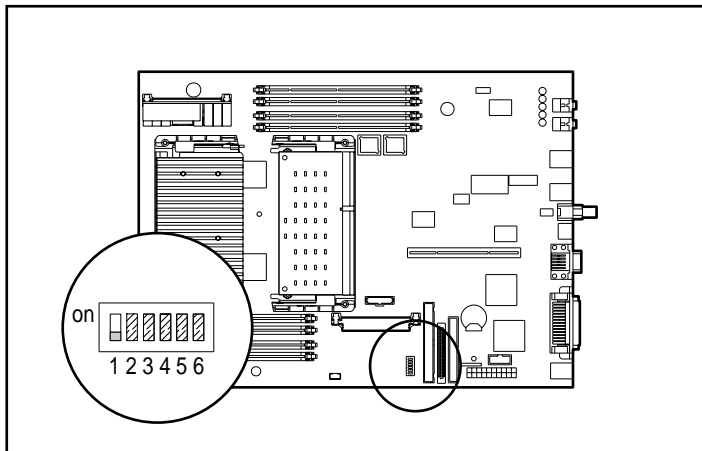
4. On SW1, move switch 1 to the ON position (currently shown in the OFF (default) position).

5. Replace the expansion board bracket. Reconnect the power cord to power connector on the rear of the workstation and to the grounded AC outlet.

IMPORTANT: You **must** replace the expansion board bracket before you restart your workstation. If the bracket is not properly seated, the workstation will not start.

---

6. Restart the workstation to erase both passwords from system memory.

NOTE: Restarting the workstation clears both the Power-On Password and the Setup Password. Be sure to reestablish both passwords.

7. Turn off the workstation once more. Disconnect the power cord from the grounded AC outlet and from the power connector on the rear of the workstation.

8. Remove the expansion board bracket to access SW1.

9. On SW1, return switch 1 to its original default (OFF) position.

10. Reassemble the workstation.

11. Establish a Power-On Password and a Setup Password, if desired.

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COMPAQ

Professional Workstation 5100

Reference Guide

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Compaq Professional Workstation 5100 Reference Guide

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About This Guide

This User Guide is designed to be used as step-by-step instructions for installation, and as a reference for operation, troubleshooting, and future upgrades.

Text Conventions

This document uses the following conventions to distinguish elements of text:

Keys	Keys appear in boldface. A plus sign (+) between two keys indicates that they should be pressed simultaneously.
USER INPUT	User input appears in a different typeface and in uppercase.
FILENAMES	File names appear in uppercase italics.
Menu Options, Command Names, Dialog Box Names	These appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These always appear in uppercase
Type	When you are instructed *to type* information, type the information **without** pressing the **Enter** key.
Enter	When you are instructed *to enter* information, type the information and then press the **Enter** key.

Symbols in Text

These symbols may be found in the text of this guide. They have the following meanings.

> **WARNING:** Indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

> **CAUTION:** Indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Presents clarifying information or specific instructions.

NOTE: Presents commentary, sidelights, or interesting points of information.

Product Safety Information

Symbols on Equipment

These icons may be located on equipment in areas where hazardous conditions may exist.

> Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. Enclosed area contains no operator serviceable parts. **WARNING:** To reduce risk of injury from electrical shock hazards, do not open this enclosure.

> Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection. **WARNING:** To reduce risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.

Power Supplies or Systems marked with these symbols indicate the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electrical shock, remove all power cords to completely disconnect power from the system.

Laser Precautions

WARNING: To reduce the risk of injury from laser radiation or damage to the equipment, observe the following precautions:

■ Allow only Compaq Authorized Service Technicians to repair the equipment.

■ Do not open any panels, operate controls, make adjustments, or perform procedures to a laser device other than those specified herein.

■ Do not stare into laser beam when panels are open.

Getting Help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Compaq Website

The Compaq website has information on this product as well as the latest drivers and Flash ROM images. You can access the Compaq website by logging on to the Internet at http://www.compaq.com.

Telephone Numbers

For the name of your nearest Compaq Authorized Reseller:

In the United States, call 1-800-345-1518
In Canada, call 1-800-263-5868
For Compaq technical support:
In the United States and Canada, call 1-800-OK-COMPAQ (1-800-652-6672).
For continuous quality improvement, calls may be recorded or monitored.

Elsewhere, call one of the numbers listed in the following table. The numbers in this table are subject to change. For the latest worldwide telephone numbers, refer to the Compaq website (http://www.compaq.com) in the Compaq Services and Technical Help area.

Compaq Worldwide Offices

Country	Main Phone Number & Fax
Argentina	+541-796-8100 Fax: +541-796-5151
Australia	+61-2-9911-1999 Fax: +61-2-9911-1800
Austria	+431-87816-0 Fax: +431-878-16-80 CompaqCare Center: +0222-8716-16
Belgium	+322-716-9511 Fax: +322-725-2213 CompaqCare Center: 02-716-9696
Brazil	+55-11-246-7866 Fax: +55-11-524-8050
Canada	905-707-1715 Fax: 416-229-8898
Central America & Caribbean	281-518-2206 Fax: 281-518-8166
Chile	+562-200-8100 Fax: +562-252-0540
China	+86-10-849-2928 Fax: +86-10-834-6726
Colombia	+571-312-0147 Fax: +571-312-0164
Czech Republic	+422-232-8772 Fax: +422-232-8773

continued

Compaq Worldwide Offices   *continued*

Denmark	+45-4590-4590
	Fax: +45-4590-4595
	CompaqCare Center: +45-4590-4545
	QuickLine: +45-4590-4550
Ecuador	+011-59-3-225-4343
	+011-59-3-246-7713
	+011-59-3-246-7715
	Fax: +011-59-3-225-4342
Europe, Middle East, and Africa	+49-89-9933-0
	+49-89-9101705
Finland	+358-0-615-599
	Fax: +358-0-6155-9898
	CompaqCare Center: +358-9800-206-720
	QuickLine: +358-0-6155 9870
France	+331-4133-4100
	Fax: +331-4133-4400
	CompaqCare Center: +331-4133-4455
	QuickLine: +331-6986-7396
	FaxPaq: Minitel 3616
Germany	+49-89-9933-0
	Fax: +49-89-9933-1158
	Compaq Infoline: 01803-221221
	CompaqCare Center: 0190-888080
	QuickLine: 01805-212111
	FaxPaq: 01805-212119
Eastern Europe, the Middle East, and Africa are also supported from Germany.	Fax: +49-(0)89-9933-2899
	CompaqCare Center: +49-(0)89-9933-2891
	QuickLine: +49-(0)89-9933-1380
Hong Kong	+85-2-2867-1600
	Fax: +85-2-2524-9533
Hungary	+36-1-201-8776
	Fax: +36-1-201-9696
India	+91-80-559-6023
	+91-80-559-6024
	Fax: +91-80-559-6025

continued

Compaq Worldwide Offices *continued*

Ireland	+00-353-1-2141000 Fax: +00-353-1-2141001
Italy	+39-2-5759-01 Fax: +39-2-824-2015 CompaqCare Center: 01-67825012 (Information) 02-575-90300 (Technical) QuickLine: 02-89-200-222
Japan	+3-5402-5700 Fax: +3-5402-5964
Korea	+82-2-3470-0766 Fax: +82-2-523-3576
Malaysia	+603-7541122 Fax: +603-7548600
Mexico	+525-229-7900 Fax: +525-229-7959
Middle East	+971-4-818 100 Fax: +971-4-818 313
The Netherlands	+31-182-565888 Fax: +31-182-538348 CompaqCare Center: +82065805 (Information) +82065810 (Technical) QuickLine: +820-72366 FaxPaq: +820-65805
Distribution Center Europe	+31-183-696400 Fax: +31-183-620488
New Zealand	+64-9-307-3143 Ext.817 Fax: +64-9-309-9198
Norway	+47-2207-2000 Fax: +47-2207-2001 CompaqCare Center: +47-2207-2020 QuickLine: +47-2207-2022
Poland	+48-22-630-3535 Fax: +48-22-630-3553

continued

Compaq Worldwide Offices   *continued*

Portugal	+3511-412-8400 Fax: +3511-412-0654
Puerto Rico	809-765-4360 Fax: 809-765-4336
Russia	+7095-9671700 Fax: +7095-9671701
Scotland	+44-141-814-8000 Fax: +44-141-812-7745
Singapore/APD	
Compaq Computer Asia/Pacific (Regional Headquarters)	+65-336-3333 Fax: +65-750-4627
Compaq Computer Asia/Pacific (Local Subsidiary including regional sales for South Asia, Indochina, Brunei, Indonesia and the Philippines)	+65-753-6688 Fax: +65-758-5975
Compaq Asia	+65-750-4319 Fax: +65-752-7385
Spain	+341-640-1500 Fax: +341-640-0064 CompaqCare Center: +341-640-1302/ 1427 QuickLine: +341-640-0267
South Africa	+27-11-728-6999 Fax: +27-11-728-3335
Sweden	+468-703-5200 Fax: +468-751-2057 CompaqCare Center: 08-703-52-40 QuickLine: +468-703-5220 FaxPaq: 08-703-52-25
Switzerland	+41-1838-2111 Fax: +41-1836-7107 CompaqCare Center: +41-1838-2222 QuickLine: +41-1838-2421 FaxPaq: +41-1838-2238

continued

Compaq Worldwide Offices *continued*

Taiwan	886-2-2735-1000
	Fax: 886-2-2732-2660
Thailand	+66-2-679-6222
	Fax: +66-2-679-6220
United Kingdom	+44-1-41-270-4000
	Fax: +44-1-41-270-4100
	CompaqCare Center: +44-1-41-270-4000
	QuickLine: +44-1-81-332-9499
	FaxPaq: +44-1-81-332-3550
United States (Corporate Office)	281-370-0670
	Fax: 281-514-1740
Austin	512-433-6000
	Fax: 512-433-6029
Dallas	800-544-5255
	Main: 972-929-1700
	Fax: 972-929-1720
Venezuela	+582-953-8844
	Fax: +582-952-7393

Chapter 1
Product Features
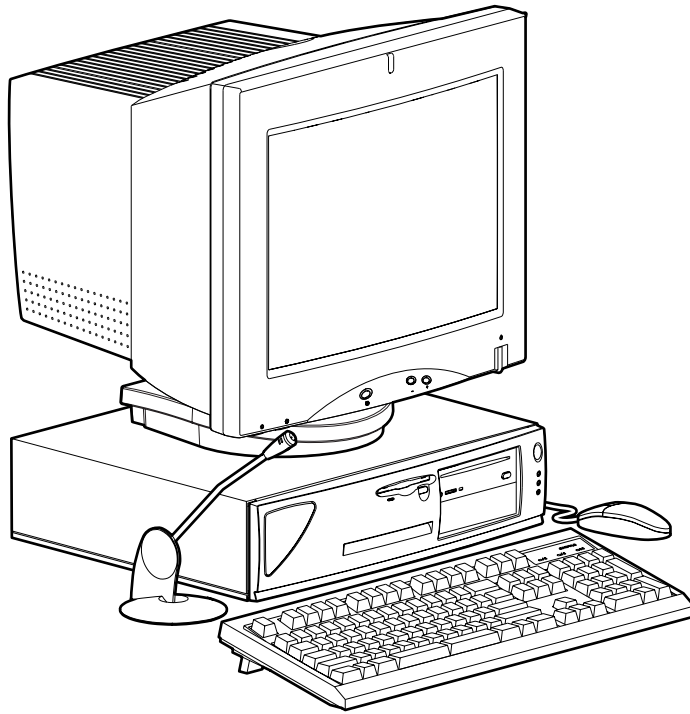
Figure 1-1.   Compaq Professional Workstation 5100

Standard Features

The Compaq Professional Workstation 5100 offers the following standard features:

Processors

■ Standard with one 266-MHz, 300-MHz, or 333-MHz Pentium II processor with an integrated 512-KB Level 2 Cache

■ Upgradable to two processors with the addition of an optional second processor

Memory

■ **System Memory—**includes 32-MB, 64-MB, 128-MB, 256-MB, or 512-MB EDO buffered, 128-bit system memory expandable to 512 MB

■ **Optional Memory Upgrades—**supports 60-ns or faster EDO buffered 16-MB, 32-MB, 64-MB, 128-MB, or 256-MB, 4-K refreshed DIMMs added in pairs

■ **Error Checking and Correcting (ECC) Memory—**uses an encoding scheme for memory error detection and correction. Specifically, this feature detects and corrects all single-bit memory errors, and detects and reports double-bit errors.

Expansion Slots

■ Three dedicated PCI slots (2 full length and 1 short PCI)

■ One shared PCI/ISA slot (1 full length PCI/ISA)

■ One dedicated ISA slot (1 short ISA)

Drive Controller

■ Integrated Wide-Ultra SCSI Controller on PCI local bus. Controller provides high-performance options for up to seven SCSI devices (in addition to the controller) without using an expansion slot for an additional controller. This controller uses a 16-bit data path and performs at a maximum data transfer rate of 40 megabytes per second (MB/s).

■ Optional controller boards are available for expanding storage capacity beyond seven devices.

Network Controller

■ Compaq Netelligent 10/100 TX Embedded UTP/Coax Controller with Remote Wakeup capability supports 32-bit data streaming at speeds up to 33 MHz.

Mass Storage

■ Five drive bays:

❏ **Bay 1**—supports a third-height device. A standard 3.5-inch diskette drive is shipped in Bay 1.

❏ **Bay 2 (Internal)**—supports a third-height (1.0") hard drive. On some models, a standard 2.1-GB or 4.3-GB Wide-Ultra SCSI hard drive is shipped in Bay 2.

❏ **Bay 3**—supports a third-height or half-height device. A standard CD-ROM drive is shipped in Bay 3.

❏ **Bay 4**—supports a half-height device. An optional PD-CD drive, CD-ROM drive, or tape drive can be installed in Bay 4.

❏ **Bay 5 (Internal)**—supports a third-height (1.0") or half-height (1.6") hard drive. On some models, a 9.1-GB Wide-Ultra SCSI hard drive is shipped in Bay 5.

Standard Interfaces

- Wide-Ultra SCSI

- Serial (2)

- Graphics

  - ❏ 2D

  - ❏ 3D

- Audio (headphone and microphone connectors, line in/line out)

- Parallel

- USB (2) (hardware-ready)

- Keyboard

- Mouse (2-, 3-, or 4-button)

- Ethernet - 10BaseT or 100TX (RJ-45 and BNC connectors)

Graphics Controllers

Depending on the model, your workstation offers *one* of the following graphics
controllers:

- **MGA Millennium II**—supports high-performance 2D graphics

- **MVP Workstation**—supports multiple monitors on a single controller

- **GLoria Synergy**—supports high resolution 2D or 3D graphics

- **GLoria-XL 3D**—supports high resolution 3D graphics

- **FireGL 4000**— supports high resolution 3D graphics

For additional information on graphics controllers, see Chapter 11.

Audio

The Compaq PremierSound Audio System features:

■ Integrated/ported speaker built into the cabinet

■ Integrated audio chip provides stereo sound and FM music synthesis

■ Stereo inputs for CD-ROM

■ Monorial input for microphone

■ Line in/line out

■ Headphone jack

ROM

■ Software upgradable firmware

■ ROMPaq Utility used to upgrade ROM

■ FailSafe Boot-Block ROM

Power Supply

The Compaq Professional Workstation 5100 is equipped with a 280-watt Power Factor Correction auto-sensing power supply.

Tower Stand

The Compaq Professional Workstation 5100 can be converted to a tower form factor by installing the Tower Stand, which is shipped standard with the workstation.

Compaq Software Features

Configuring, updating, monitoring, and managing your workstation are simplified with software customized for your workstation by Compaq engineers. Software features include:

■ Preinstalled image of software

■ SmartStart for Workstations

■ Intelligent Management

■ Asset Management

■ Security Features

■ Diagnostic Tools

Preinstalled Software

Your Compaq Professional Workstations contains a factory preinstallation of the following software:

■ Microsoft Windows NT operating system

■ Compaq Diagnostics for Windows NT

■ Microsoft Internet Explorer 4.x

■ Compaq support software (drivers)

■ Other Compaq utilities

■ Microsoft Service Pack 3

You must complete the setup procedures for the preinstalled software before you can use the operating system for the first time. If the preinstalled software on your workstation has been deleted or modified, you can install Microsoft Windows NT, Compaq support software, and Compaq utilities using SmartStart for Workstations.

For more information about completing the setup procedures for preinstalled software, refer to the *Software Installation Guide* included with your workstation.

SmartStart for Workstations

If the preinstalled software on your workstation has been deleted, you can install the operating system and support software using SmartStart for Workstations. SmartStart for Workstations is an easy-to-follow program that streamlines operating system and support software setup for the Compaq Professional Workstation. SmartStart provides an alternate method for installing the preinstalled software components.

The Compaq SSD for Windows NT (NTSSD), included on the SmartStart for Workstations CD, contains support software and utilities that enable you to take advantage of specific capabilities offered on the Compaq Professional Workstation. This support software is provided for use with Windows NT Workstation 4.0 on Compaq hardware only. The NTSSD will automatically install applicable software drivers on your system. To download the latest NTSSD, see the Compaq website at http://www.compaq.com in the Compaq Services and Technical Help area under Downloadables.

You can install drivers manually without the help of the NTSSD. To obtain the latest drivers, including drivers for Microsoft Windows NT Workstation 4.0, Windows NT Workstation 3.51, and Windows 95, access the Compaq website at http://www.compaq.com in the Compaq Services and Technical Help area under Downloadables.

For information on using SmartStart for Workstations or the NTSSD, refer to the *Software Installation Guide* included with your workstation.

Intelligent Management

Your workstation is easily maintained using Compaq Configuration Management. Configuration Management features include:

- ROM Flash
  - Local
  - Remote
  - FailSafe Boot Block ROM
- Remote Security Management
- Remote Wakeup and Remote Shutdown
- Establishment of Power Management Settings
- Enhanced Support Software CD and Compaq website
  - Compaq Integrated Software

For more information on Configuration Management, see Chapter 4.

Asset Management

Compaq Diagnostics for Windows NT is included on your workstation and allows you to view system-specific information.

For information on using Compaq Diagnostics for Windows NT, see Chapter 4.

Security Features

Security features are as follows:

■ Keyboard Password

■ Administrator Password

■ QuickLock/QuickBlank

■ Diskette Write Control

■ Diskette Boot Control

■ Serial Interface Control

■ Parallel Interface Control

■ Security Lock Provision

■ Smart Cover Sensor

These security features are established through the Computer Setup utility. For information concerning workstation security features, see Chapter 3.

Diagnostic Tools

The software and firmware diagnostic tools available for your use are:

- Power-On Self-Test (POST)

- Diagnostics (DIAGS)

- Computer Setup and Inspect

- ROMPaq utilities to upgrade flash ROMs

For information on using diagnostic tools, see Chapter 2.

Front Panel Components

The following figure identifies the front panel components. Refer to the corresponding table for a description of each component.
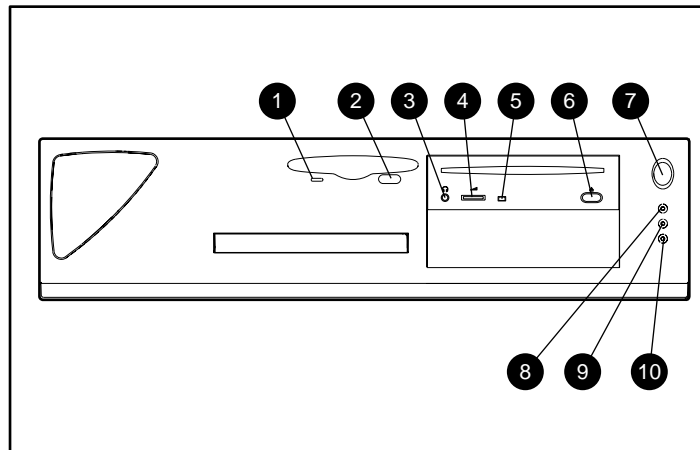
Figure 1-2.   Identifying front panel components

Table 1-1
Front Panel Components

Ref.	Component	Function
1	Diskette drive LED	When lighted, indicates the drive is reading or writing data
2	Diskette drive ejector button	Partially ejects 3 1/2″ diskette from diskette drive
3	Headphone jack	Connect to headphones
4	Volume control	Controls headphone volume
5	CD-ROM drive LED	Lights when the CD-ROM drive is reading data
6	CD-ROM drive ejector button	Partially ejects compact disk from CD-ROM drive
7	Power switch	Turns the workstation on or off
8	Power on/off LED	When lighted, indicates the workstation is turned on.
9	Hard drive activity LED	When lighted, indicates the workstation is reading or writing data to the hard drive(s)
10	Network activity LED	When lighted, indicates the workstation is receiving or sending data on the network

Rear Panel Components

The following figure illustrates the location of the external connectors as well as the serial number. Each connector includes an icon to help identify its function.
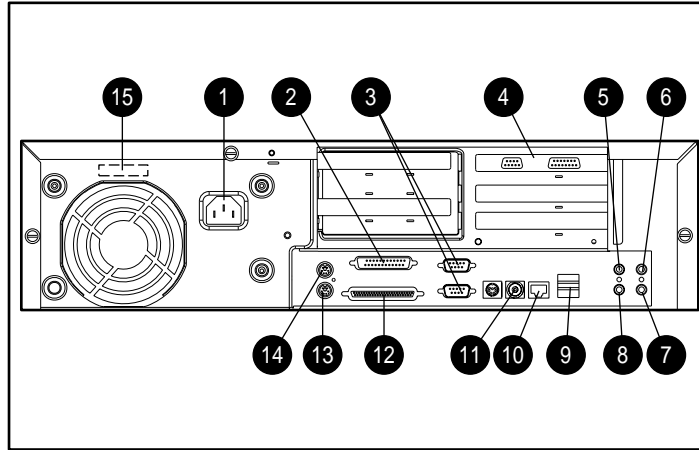
Figure 1-3.   Identifying rear panel components

Table 1-2
Rear Panel Components

Ref.	Component	Function
1	Power cord connector	Connects to the power cord.
2	Parallel port connector	Connects a parallel device such as a printer
3	Serial port connectors	Connects a serial device, such as a serial printer COM 2 (B) on top, COM 1 (A) on bottom
4	Video connector	Connects to a monitor
5	Microphone connector	Connects a microphone

continued

Rear Panel Components *continued*

Ref.	Component	Function
6	Audio line-in connector	Connects a device that supplies sound, such as a tape deck or CD player
7	Audio line-out connector	Connects an external amplifier (to power additional speakers) or a tape deck for recording
8	Headphone jack	Connects to headphones
9	USB connectors (2)	Connects a series of USB devices
10	Ethernet RJ-45 connector	Connects to the Ethernet network
11	Ethernet BNC connector	Connects to the Ethernet network
12	Wide-Ultra SCSI connector	Connects to external SCSI devices
13	Keyboard connector	Connects to a keyboard (orange icon)
14	Mouse connector	Connects to a mouse (green icon)
15	Serial number	Identifies the workstation

Using the Keyboard and Mouse

The Compaq Professional Workstation 5100 ships with a keyboard and a two-, three-, or four-button mouse, depending on your model.

Special Keyboard Functions

Some keys on the keyboard provide special functions, depending on the software application you are using. The following figure identifies all special function keys. Refer to the corresponding table for a description and function of each key.
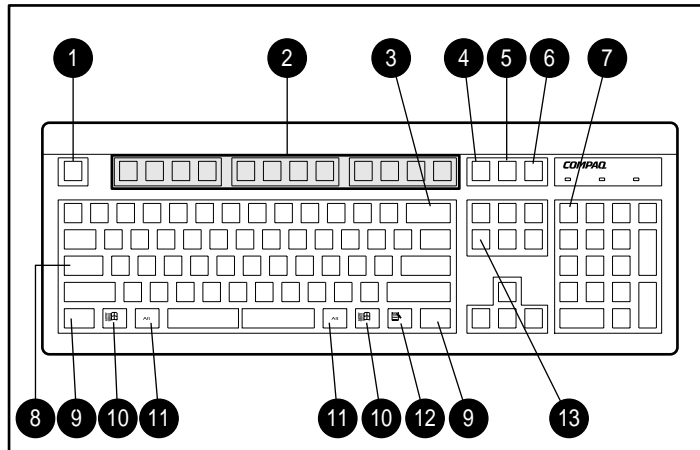
Figure 1-4.   Identifying Special Function keys

Table 1-3
Special Function Keys

Ref.	Key	Function
1	Esc	Often assigned a specific task by the application. Frequently used as an exit key (for quitting an application), for moving back one screen, or for canceling a command.
2	F1 - F12	Use for specific effects in applications and operating systems. Refer to the application software documentation.
3	Backspace	Moves the cursor left and deletes characters as it moves to the left.
4	Print Scrn	Depending on the software you are using, prints the displayed screen to a printer. Using this key may not print the entire file.
5	Scroll Lock	When the Scroll Lock light is on, the screen is prevented from scrolling.
6	Pause	Temporarily suspends screen scrolling or some operations.
7	Num Lock	When the Num Lock light is on, the numeric keypad is activated and the arrow keys are deactivated. (The arrow keys to the left of the keypad perform the same functions as the arrow keys on the keypad.)
8	Caps Lock	When the Caps Lock light is on, all letters typed are capitalized.
9	Ctrl	Used in combination with another key, its effect depends on the application software you are using.

continued

Special Function Keys *continued*

Ref.	Key	Function
10	Windows Logo*	Used to open the Start menu in Microsoft Windows NT. Used in combination with other keys to perform other functions. (See next table.)
11	Alt	Used in combination with another key, its effect depends on the application software you are using.
12	Application*	Used (like the right mouse button) to open pop-up menus in a Microsoft Office application. May perform other functions in other software applications.
13	Delete	Used to delete characters.

*Keys available in select geographic regions.

Windows Logo Keys

The following table shows you how to use the Windows Logo keys in combination with other keys to perform certain functions in Windows NT.

**Table 1-4
Key Combinations**

Windows Logo Key Combination	Functionality in Windows NT
Windows logo key + F1	Displays a pop-up menu for the selected object.
Windows logo key + Tab	Activates the next Taskbar button.
Windows logo key + E	Launches Explore My Computer.
Windows logo key + F	Launches Find Document.
Windows logo key + Ctrl+F	Launches Find Computer.
Windows logo key + M	Minimizes all open applications.
Shift+Windows logo key + M	Undoes Minimize All.
Windows logo key + R	Displays Run dialog box.

Keyboard Lights

The following figure identifies the location of the three keyboard lights. For a description and purpose of each light, refer to the corresponding table.
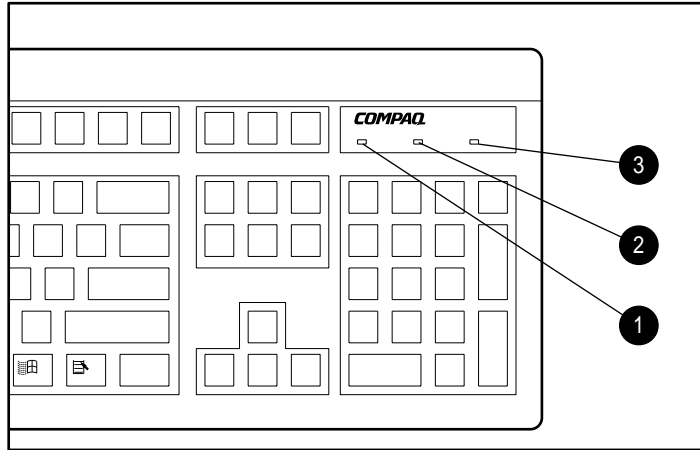
Figure 1-5.   Keyboard lights

Table 1-5
Keyboard Lights

Ref.	Description	Function
1	Num Lock	When Num Lock is enabled (light is on), the numeric keypad is activated.
2	Caps Lock	When the Caps Lock is enabled (light is on), all text appears in uppercase when typed.
3	Scroll Lock	When Scroll Lock is enabled (light is on), the screen is prevented from scrolling.

Mice

Depending on the model, your workstation comes with *one* of the following mice:

■ Two-button

■ Three-button

■ Four-button

Most software applications support the use of a mouse. The functions assigned to each mouse button depend on the software application you are using.

The Logitech OEM MouseWare v2.3A-NT software provides special drivers and an applet that allow you to define the functionality of the mouse buttons. For more information on installing this software, refer to the *Workstation Software Reference* included on the SmartStart for Workstations CD. If you have a 4-button mouse, see the documentation included with the mouse for more information.

Warranty

■ Three-year limited worldwide warranty

■ Pre-Failure warranty on processors, memory, and hard drives. Refer to the *Limited Warranty* for additional information.

Chapter 2
Compaq Setup and Diagnostic Software

Your Compaq Professional Workstation 5100 comes with Compaq setup and diagnostic software. This software includes Compaq Utilities preinstalled on a hard drive partition, and ROM BIOS (Read Only Memory Basic Input/Output System). This chapter explains how to access the Compaq Utilities menu, describes the options available in Compaq Utilities, and discusses the ROM BIOS.

If you have reformatted your hard drive and removed the Compaq Utilities partition, it can be reinstalled by using the Compaq SmartStart for Workstations CD, or you can download Setup and User Diagnostics diskettes from the Compaq website at http://www.compaq.com in the Compaq Services and Technical Help area under Downloadables.

> **IMPORTANT:**   For more information about installing your operating system, drivers, and other support software, refer to the *Software Installation Guide* included with your workstation.

Accessing the Compaq Utilities Menu

To access the Compaq Utilities menu:

1. Turn on or restart the workstation.

    NOTE: Do not restart your workstation while in Windows NT. Exit Windows NT, then restart the workstation.

2. When the cursor blinks in the upper-right corner of the screen, press **F10.** You have approximately two seconds to press **F10** or you must restart the workstation.

3. Press **Enter** to bypass the title and welcome screens. The Compaq Utilities menu appears.

The Compaq Utilities menu consists of the following choices:

- Computer Setup

- Computer Checkup (TEST)

- View System Information (INSPECT)

- Create a Diagnostics Diskette

- Manage Diagnostics Partition

- Exit from this Utility

Computer Setup

Use Computer Setup in the following instances:

- To verify configuration parameters when resolving problems.

- To get an overview of the workstation's hardware.

- To modify settings for graphics, processor, memory, audio, storage, communications, and input devices.

- To enable or disable removable media drive boot ability.

- To enable or disable removable media drive write control.

- To enable or disable the serial or parallel ports.

- To resolve errors when a system configuration error is detected during the Power-On Self-Test (POST) and is not automatically fixed by POST.

- To change factory default settings.

- If you add new options, such as a network interface controller upgrade.

> **IMPORTANT:**   Be sure to configure new options and drivers in your operating system after they have been configured by the Setup utility.

Security Management

Your workstation offers security features that provide solutions for a variety of potential concerns. Use the Security Management feature of Computer Setup:

■ To set or change the setup (administrator) password, which protects the workstation configuration.

■ To set or change your power-on password.

■ To password-protect access to your system after turning on the workstation.

■ To set or change QuickLock/QuickBlank features.

See Chapter 3 to identify the security features, their purposes, and how to establish them.

Power Management

Use the Power Management feature of Computer Setup:

■ To create a custom power conservation level.

■ To enable or disable power management.

■ To change component time-out periods.

> **CAUTION:**   Using the Energy Save Monitor feature with non Energy Star-compliant monitors may cause video distortion when the Screen Save time-out occurs.

Computer Checkup (TEST)

Use Computer Checkup (TEST):

■ To determine if all devices are recognized by the system and functioning properly. Running TEST is optional, but recommended, after you install or connect a new device.

■ To save, print, or display the information generated by TEST. It is recommended that you run TEST and have the printed report available before placing a call to the Compaq Customer Support Center.

■ To assist your Compaq authorized dealer, reseller, or service provider in analyzing the system by allowing the service provider to reproduce the same environment on another workstation for testing.

To run Computer Checkup (TEST):

1. Turn on only the external devices that you wish to test. You may wish to leave the printer connected to log error messages.

2. Access the Compaq Utilities menu.

3. From the Compaq Utilities menu, select Computer Checkup (TEST).

4. When the test option menu appears, select the option to view the device list.

5. Verify that TEST correctly detected the devices installed.

   NOTE: This utility detects all devices manufactured by Compaq; devices from other manufacturers may not be detected.

   ❏ If the list is correct, select OK and go to step 6.

   ❏ If the list is incorrect, be sure that any new devices are installed properly. If there is an installation problem, call your Compaq authorized dealer, reseller, or service provider.

6. Select one of the following from the test option menu:

   ❏ **Quick Check Diagnostics**—This option runs a quick, general test on each device with a minimal number of prompts. If errors occur, they are displayed when the testing is complete.

   ❏ **Automatic Diagnostics**—This option runs unattended, maximum testing of each device with minimal prompts. You can choose how many times to run the tests, to stop on errors, or to print or file a log of errors.

   ❏ **Prompted Diagnostics**—This option allows maximum control over the device testing process. You can choose attended or unattended testing, decide to stop on errors, or choose to print or file a log of errors.

7. Follow the instructions on the screen as the diagnostic tests are run on the devices. When the testing is complete, the screen displays the test option menu again.

   NOTE: When running TEST, record any error message numbers and have them available when you contact your Compaq authorized dealer, reseller, or service provider for assistance.

8. Exit to the Compaq Utilities menu.

View System Information (INSPECT)

Use View System Information (INSPECT) in the following instances:

- To view information about the system once it has been configured.

- To save, print, or display the information generated by INSPECT. It is recommended that you run INSPECT and have the printed report available before placing a call to the Compaq Customer Support Center.

- To assist your Compaq authorized dealer, reseller, or service provider in analyzing the system by allowing the service provider to reproduce the same environment on another workstation for testing.

INSPECT provides the following information about the system's operating environment:

- Contents of the operating system startup files

- Current memory configuration

- ROM versions

- Type of processor and coprocessor

- Types of drives installed

- Active printer and communications interfaces

- Type of modem installed

- Graphics details

Create a Diagnostics Diskette

This option allows you to create *either* Setup or Diagnostics diskettes from the diagnostics partition. To create the diskettes:

1. Turn on or restart the workstation. If Windows NT is running, click Start, Shut Down, Restart the computer.

2-7

Immediately after the workstation completes Power-On Self-Test (POST), which is indicated on the screen by the memory check, the system beeps twice and the cursor moves to the upper-right corner of the screen.

2. Press **F10** as soon as the cursor moves to the upper-right corner of the screen.

3. If prompted, select the desired language.

4. Press **Enter** to bypass the Welcome to Compaq Utilities screen.

5. From the Compaq Utilities menu, select Create a Diagnostics Diskette. One diagnostic and two setup diskettes will be created.

   NOTE: The Diagnostics and Setup diskettes can also be created by downloading the latest version from the Compaq website at http://www.compaq.com in the Compaq Services and Technical Help area under Downloadables.

Manage a Diagnostics Partition

This option allows you to create, delete, or upgrade the diagnostics software on the workstation. This must be performed from a diagnostics diskette.

> **CAUTION:**   Creating a diagnostics partition involves performing a low-level format on the hard drive. Normally, this is only done to add diagnostics to a new replacement hard drive. If the diagnostics software is deleted, you will no longer be able to access the Compaq Utilities menu.

Exit from This Utility

Use this option to exit the Compaq Utilities menu.

ROM BIOS

Your workstation contains a set of software called Basic Input/Output System (BIOS) stored in Read Only Memory (ROM) on the system board. The BIOS contains a set of routines for Power-On Self-Test (POST) and accessing hardware specific information. The ROM is composed of a flash upgrade component and a static boot block.

Power-On Self-Test

When you turn on your workstation, the BIOS runs a number of tests, called Power-On Self-Tests (POSTs). These tests check and initialize many hardware components. The basic sequence for POST is:

1. Check and initialize low level hardware.

2. Count memory.

    The memory count is displayed in the upper left corner of the monitor screen in increments of kilobytes (KB).

3. Detect and spin up hard drives and other SCSI devices. A message will be displayed:

    SCSI Device Detected - System Board, SCSI Idx: <disk ID> where x is from 0 to 7 and disk ID is the drive type.

4. Boot from, in sequence, either a CD, a diskette, or the hard drive.

Runtime Services

After your workstation boots to the operating system, the BIOS still provides some runtime services to the operating system. For instance, the BIOS provides information to the operating system on how many processors are installed, how the system interrupts are configured, and information on the disk drives. BIOS also provides information about your workstation's configuration and maintenance.

Upgrading the ROM BIOS

The flashable component of the ROM BIOS on your workstation can be upgraded. Since the BIOS is stored in ROM on the system board, the upgrade procedure is different than the upgrade procedure for other software.

New versions of the ROM BIOS may be downloaded from the Compaq website at http://www.compaq.com in the Technical Help and Services area under Downloadable Files. ROM BIOS upgrades are called ROMPaqs.

To upgrade your ROM BIOS, execute the ROMPaq software and follow the directions given by the ROMPaq software.

Boot Block ROM

The boot block is a flash-protected section of the ROM that can not be upgraded.

For more information about Boot Block ROM, see FailSafe Boot Block ROM in Chapter 4.

Chapter 3
Security Features

Your workstation includes security features that provide solutions for potential security problems. This chapter identifies these features and describes their purposes.

The following table describes how the security features function. In some cases, you must set switches. For information on setting these switches, see the hood labels located on the underside of the workstation cover.

Table 3-1
Security Features

| Feature	Purpose	How It Is Established
Setup Password	Prevents reconfiguration of the workstation (use of the Computer Setup utility) until the Setup Password is entered. Utilized by system administrator.	Computer Setup from the Compaq Utilities menu
Power-On Password	Prevents use of the workstation until the Power-On Password is entered. Blocks unauthorized users.	Computer Setup from the Compaq Utilities menu
Logon Password	Prevents use of the workstation unless logon password is entered. Allows file security for multiple users.	Windows NT Security
QuickLock/ QuickBlank	Disables keyboard and can blank the screen without exiting application; enabled with a Power-On Password	Computer Setup from the Compaq Utilities menu
Serial Interface Control	Prevents transfer of data through the integrated serial interface	Computer Setup from the Compaq Utilities menu

continued

Security Features *continued*

Feature	Purpose	How It Is Established
Parallel Interface Control	Prevents transfer of data through the integrated parallel interface	Computer Setup from the Compaq Utilities menu
Removable Media Control	Prevents writing to the removable media drives. Allows read only	Computer Setup from the Compaq Utilities menu
Smart Cover Sensor	Indicates when workstation cover has been removed. Can be set to require Setup Password after cover has been removed.	Computer Setup from the Compaq Utilities menu.
Cable Lock Provision	Inhibits access to the interior of the workstation to prevent unwanted configuration changes or component removal. Can also be used to secure the workstation to a fixed object.	Install a padlock with the security bracket to inhibit access to the interior of the workstation; add a cable lock to secure the workstation to a fixed object.

Password Security

Your workstation supports security password features that can be established by selecting Computer Setup from the Compaq Utilities menu. To access these features, complete the procedures described in the sections that follow.

Power-On Password

Establishing a Power-On Password through Computer Setup prevents unauthorized access to the workstation when the power is turned on. To access the workstation, you must enter the password when the key icon ($^0\neg$) appears on the monitor.

> **NOTE**:   The Power-On Password may only be established (for the first time) using the Computer Setup utility. Once established, the Setup utility cannot be used to change or delete the Power-On Password. To change or delete the Power-On Password, see "Changing a Power-On Password" or "Deleting a Power-On Password" in this chapter.

To establish a Power-On Password, follow these steps:

1. Turn on the workstation.

2. When the cursor appears in the upper-right corner of the screen, press **F10**.

   NOTE: The cursor displays in the upper-right corner of the screen for approximately two seconds. If you do not press **F10** during this time, you must turn the workstation off, then on again to access the utility.

3. Press **Enter** to bypass the welcome screens and display the main menu.

4. From the main menu, select Computer Setup and press **Enter**.

5. From the Computer Setup main menu, select the Security Management feature under Built-In Devices.

6. Locate the Power-On Password option and follow the instructions provided to enable it.

7. Save the configuration and exit the utility.

For more information about the various screen and configuration options, See Chapter 2.


Entering a Power-On Password

To enter the Power-On Password, follow these steps:

1. Turn on the workstation.

2. When the key icon (⃞⊓) appears on the monitor, enter your current password.

   NOTE: Type carefully; for security reasons, the characters you type do not appear on the screen. If you enter the password incorrectly, a broken key icon (⃞ˣ⊓) appears. Try again. After three unsuccessful tries, you must turn off the workstation, then turn it on again before you can continue.

Changing a Power-On Password

To change the Power-On Password, follow these steps:

1. Turn on the workstation. (If the workstation is already on, you must turn it off and then on again.)

2. When the key icon (⌐) appears, type your current password, then a slash (/) or alternate delimiter character, your new password, another slash(/) or alternate delimiter character, and your new password:

   current password/new password/new password

    NOTE: Type carefully; for security reasons, the characters you type do not appear on the screen. See the "National Keyboard Delimiter Characters" section in this chapter for information about the alternate delimiter characters.

    IMPORTANT: Be sure to record your password and put it in a safe place.

Completing this procedure causes the new password to take effect the next time you turn on the workstation.

Deleting a Power-On Password

To delete the Power-On Password, follow these steps:

1. Turn on the workstation.

2. When the key icon (⌐) appears, type your current password followed by a slash (/) or alternate delimiter character: current password/

    This will delete the password until you establish a new one.

    NOTE: See the "National Keyboard Delimiter Characters" section in this chapter for information about alternate delimiter characters.

National Keyboard Delimiter Characters

Each keyboard is designed to meet country-specific requirements. The syntax and keys that you use for changing or deleting your password depend on the keyboard that came with your workstation. To determine the delimiter key required for changing or deleting your password, find your keyboard in the following table.

**Table 3-2
National Keyboard Delimiter Characters**

Arabic	/	Greek	-	Slovakian	-
Belgian	=	Hungarian	-	Spanish	-
BHCSY*	-	Italian	-	Swedish/Finnish	/
Brazilian	/	Japanese	/	Swiss	-
Chinese	/	Hangul	/	Taiwanese	/
Czech	-	Latin American	-	Thai	/
Danish	-	Norwegian	-	Turkish	·
French	!	Polish	-	U.K. English	/
French Canadian	é	Portuguese	-	U.S. English	/
German	-	Russian	/		

*Bosnia-Herzegovina, Croatia, Slovenia, and Yugoslavia

Clearing a Power-On Password

If you forget your password, you cannot access the workstation. To clear the
Power-On Password, follow these steps:

1. Turn off the workstation.

2. Remove the following components:

   ❏ workstation cover

   ❏ expansion board cage

3. Locate the SW1 switch on the system board. The following figure shows
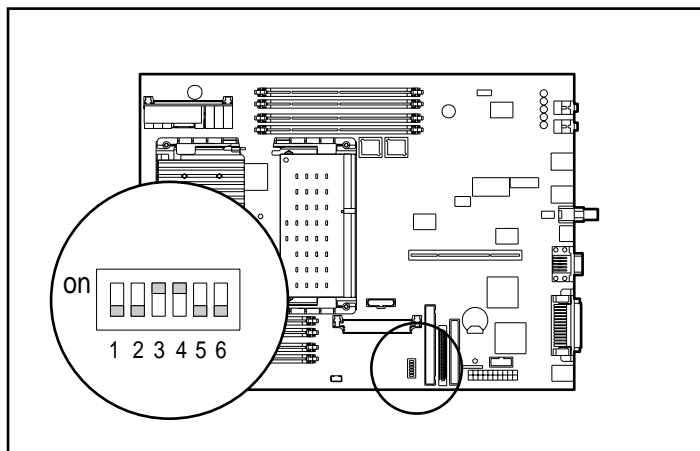   the default switch setting for each switch on SW1.

Figure 3-1.   Locating the SW1 switch and identifying default settings

4. On SW1, move switch 1 to the ON position (not shown).

> **IMPORTANT:**   Switch 1 has a default setting of OFF. When the switch is
> OFF, your system is password-protected. To re-enable password protection,
> you MUST return the switch to its *default* position later in this procedure.

5. Restart the workstation to erase your password from system memory.

   NOTE: Clearing the Power-On Password will also clear the Setup Password. Be sure to reestablish your Setup Password after clearing the Power-On Password.

6. Turn off the workstation once more.

7. Return switch 1 to its original default (OFF) position.

8. Reassemble and restart the workstation.

9. Establish a new Power-On Password, if desired.

Setup Password

Establishing a Setup Password through the Computer Setup utility prevents reconfiguration of the workstation until the Setup Password is entered.

If your workstation does not have a Setup Password enabled, then the ROM is not write-protected. Updates may occur that could disrupt the operating system. The Setup Password is disabled when the workstation leaves the factory.

   NOTE: The Setup Password is different from the Power-On Password. The Setup Password is designed for network administrators to lock in the proper configuration settings of the workstation. Individual users can still retain local control of the workstation by using the Power-On Password feature.

To establish a Setup Password through Computer Setup, follow these steps:

1. Turn on the workstation.

2. When the cursor appears in the upper-right corner of the screen, press **F10**.

   NOTE: The cursor displays in the upper-right corner of the screen for approximately two seconds. If you do not press **F10** during this time, you must turn the workstation off, then on again to access the utility.

3. Press **Enter** to bypass the welcome screens and display the main menu.

4. From the main menu, select Computer Setup and press **Enter**.

5. From the Computer Setup main menu, select the Security Management feature under Built-In Devices.

6. Locate the Setup Password option and follow the instructions on the screen to enable it.

7. Save the configuration and exit the Computer Setup utility.

Entering the Setup Password

To enter the Setup Password, follow these steps:

1. Turn on the workstation.

2. When the cursor appears in the upper-right corner of the screen, press **F10**.

    NOTE: The cursor displays in the upper-right corner of the screen for approximately two seconds. If you do not press **F10** during this time, you must turn the workstation off, then on again to access the utility.

3. When the key icon (⌐) appears, enter your current Setup Password carefully.

    NOTE: Be sure to enter the Setup Password, not the Power-On Password. Type carefully; for security reasons, the characters you type do not appear on the screen. If you enter the Setup Password incorrectly, a broken key icon (⌐) appears. Try again. After three unsuccessful tries, you will be allowed to view the current computer settings, but you will not be able to edit or change the settings. If you only want to view the current computer settings, press **Enter**.

Changing a Setup Password

To change the Setup Password, follow these steps:

1. Turn on the workstation.

2. When the cursor appears in the upper-right corner of the screen, press
   F10.

   NOTE: The cursor displays in the upper-right corner of the screen for
   approximately two seconds. If you do not press **F10** during this time, you must
   turn the workstation off, then on again to access the utility.

3. Enter the current Setup Password.

   NOTE: Type carefully; for security reasons, the characters you type do not
   appear on the screen. See the "National Keyboard Delimiter Characters"
   section in this chapter for information about the alternate delimiter characters.

4. Press **Enter** to bypass the welcome screens and display the main menu.
   When the key icon (⃞ㄱ) appears, type your current password, then a
   slash (/) or alternate delimiter character, your new password, another
   slash(/) or alternate delimiter character, and your new password:
   current password/new password/new password

   NOTE: The Setup Password may also be changed by using the Computer
   Setup utility. Follow the "Setup Password" procedure provided earlier in this
   chapter. Locate the Setup Password option and follow the instructions to
   change the Setup Password.

Completing this procedure causes the new password to take effect the next time
you turn on the workstation.

Deleting a Setup Password

To delete the Setup Password, follow these steps:

1. Turn on the workstation.

2. When the cursor appears in the upper-right corner of the screen, press
   F10.

   NOTE: The cursor displays in the upper-right corner of the screen for
   approximately two seconds. If you do not press **F10** during this time, you must
   turn the workstation off, then on again to access the utility.

3. When the key icon (⬚) appears, type your current password followed
   by a slash (/) or alternate delimiter character: current password/

   This will delete the password until you establish a new one through
   Security Management.

   NOTE: The Setup Password may also be deleted by using the Computer Setup
   utility. Follow the "Setup Password" procedure provided earlier in this chapter.
   Locate the Setup Password option and follow the instructions to delete the
   Setup Password. The Setup utility will provide an option to disable the Setup
   Password; disabling the Setup Password is the same as deleting it.

   See the "National Keyboard Delimiter Characters" section in this chapter for
   information about alternate delimiter characters.

Clearing a Setup Password

If you forget your Setup Password, you cannot use the Computer Setup utility to change the configuration settings. You can view the current settings, but you can not change them unless you know the Setup Password.

To clear the Setup Password:

1. Turn off the workstation.

2. Remove the following components:

   ❏ workstation cover

   ❏ expansion board cage

3. Locate the SW1 switch on the system board. The following figure shows the default switch setting for each switch on SW1.
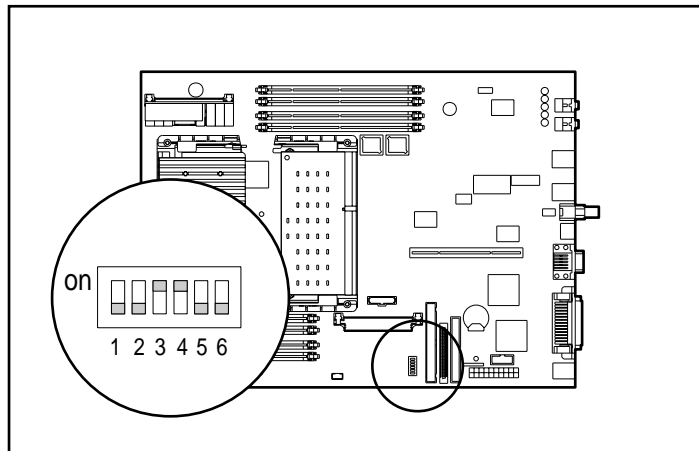
Figure 3-2.   Locating the SW1 switch and identifying default settings

4. On SW1, move switch 1 to the ON position (not shown).

> **IMPORTANT:** Switch 1 has a default setting of OFF. When the switch is OFF, your system is password-protected. To re-enable password protection, you MUST return the switch to its *default* position later in this procedure.

5. Restart the workstation to erase your password from system memory.

   NOTE: Clearing the Setup Password will also clear the Power-On Password. Be sure to reestablish your Power-On Password after clearing the Setup Password.

6. Turn off the workstation once more.

7. Return switch 1 to its original default (OFF) position.

8. Reassemble and restart the workstation.

9. Establish a new Setup Password, if desired.

Advanced Security Management

The following security features can be accessed through the Computer Setup option on the Compaq Utilities menu.

■ Disable removable media boot ability

■ Disable removable media write ability

■ Disable serial port

■ Disable parallel port

■ QuickLock/QuickBlank

■ Smart Cover Sensor

NOTE: QuickLock/QuickBlank must be used in combination with a Power-On or Setup Password.

Disabling Diskette Boot or Diskette Write

> **IMPORTANT:**   If you disable the Diskette Boot feature, the FailSafe Boot
> Block ROM will ignore the disabled feature to accommodate a FLASH
> recovery in the event a system ROM failure occurs.

To disable the factory settings that permit the workstation to boot from a
diskette, or to prohibit a user from saving data to a diskette, follow these steps:

1. Turn on the workstation.

2. When the cursor appears in the upper-right corner of the screen,
   press **F10**.

   NOTE: The cursor displays in the upper-right corner of the screen for
   approximately two seconds. If you do not press **F10** during this time, you must
   turn the workstation off, then on again to access the utility.

3. Press **Enter** to bypass the welcome screens and display the main menu.

4. From the main menu, select Computer Setup, then press **Enter**.

5. From the Computer Setup main menu, select the Security Management
   feature under Built-In Devices.

6. Select Storage.

7. Under Removable Media, select the function you want to disable.

8. Save the configuration and exit the utility.

9. Reboot the workstation.

   NOTE: Compaq recommends that you establish a Setup Password to prevent
   another user from entering the Computer Setup utility and changing any
   settings.

Disabling a Serial Port or Parallel Port

To disable either of the serial ports or the parallel port:

1. Turn on the workstation.

2. When the cursor appears in the upper-right corner of the screen, press **F10**.

    NOTE: The cursor displays in the upper-right corner of the screen for approximately two seconds. If you do not press **F10** during this time, you must turn the workstation off, then on again to access the utility.

3. Press **Enter** to bypass the welcome screens and display the main menu.

4. From the main menu, select Computer Setup, then press **Enter**.

5. From the Computer Setup main menu, select Communications under Built-In Devices.

6. To disable a Serial Port:

    ❏   Click on the down arrow of Available Serial Ports.

    ❏   Under Settings, select Disable for Serial Port 1 or Serial Port 2, whichever you want to disable.

7. To disable the Parallel Port:

    ❏   Under Settings, click the down arrow to locate Parallel Port.

    ❏   Select Disable.

8. Save the configuration and exit the utility.

9. Reboot the workstation.

Enabling QuickLock/QuickBlank

QuickLock and QuickBlank are enabled through Security Management in Computer Setup. These features allow you to:

■ Disable the keyboard and mouse interface (QuickLock)

■ Blank the screen from within an application (QuickBlank)

NOTE: To re-enable the keyboard and mouse interface and access the application, you must enter the Power-On Password that you established in Security Management. Therefore, you must establish a Power-On Password in order to utilize QuickLock and QuickBlank.

To enable the QuickLock and QuickBlank features, the Power-On Password must be enabled. Then:

1. Turn on the workstation.

2. When the cursor appears in the upper-right corner of the screen, press **F10**.

   NOTE: The cursor displays in the upper-right corner of the screen for approximately two seconds. If you do not press **F10** during this time, you must turn the workstation off, then on again to access the utility.

3. Press **Enter** to bypass the welcome screens and display the main menu.

4. Select Computer Setup from the main menu and press **Enter.**

5. From the Computer Setup main menu, select the Security Management feature under Built-In Devices.

6. Select Enable QuickLock of the Keyboard to enable the QuickBlank the Screen When Locked and Initiate QuickLock When entering Energy Saver Modes.

   NOTE: In order to use Initiate QuickLock when entering Energy Saver Mode, the Power Management option must be enabled.

7. Check the function desired by clicking in the appropriate box.

8. Save the configuration and exit the utility.

For more information about the various screen and configuration options, See Chapter 2.

Disabling the Keyboard and Mouse Interface

Once in an application, enter the QuickLock key combination (**Ctrl**+**Alt**+**L**). The keyboard and mouse (or other input device connected to the mouse connector) are disabled. The application cannot be accessed, but remains in view, unless the QuickBlank feature was also enabled through the Computer Setup utility.

Enabling the Keyboard and Mouse Interface

To enable the keyboard and input device connected to the mouse connector, enter the Power-On Password.

NOTE: For security reasons, the characters you type do not appear on the screen. The application will not be affected by the characters typed.

Smart Cover Sensor

Smart Cover Sensor is a combination of hardware and software technologies that can alert you when the workstation cover has been removed. The following table describes three levels of protection.

Table 3-3
Smart Cover Sensor Protection Levels

Level	Setting	Description
Level 0	Disabled	Smart Cover Sensor is disabled.
Level 1	Notify User	When the workstation is restarted, the screen displays a message indicating that the workstation cover has been removed.
Level 2	Setup Password	When the workstation is restarted, the screen displays a message indicating that the workstation cover has been removed. You must enter the Setup Password to continue.

The following elements determine the behavior of the Smart Cover Sensor:

■ **SW1-S1 (Switch 1 of Switch Block 1)**—See the hood labels affixed to the underside of the workstation cover if you need help locating the switch on the system board.

■ **The Setup Password**—See "Setup Password" or "Clearing a Setup Password" in this chapter to enable or disable the Setup Password.

■ **The Smart Cover Sensor setting**—Three settings are possible: Disabled, Notify User, and Setup Password. See "Setup Password" in this chapter to select the desired setting.

See Appendix G for a summary of the Smart Cover Sensor functions based on the above three elements.

Cable Lock Provision

The cable lock provision consists of a two-piece security bracket. The bottom part of the bracket is attached to the workstation with a screw; the top part of the bracket covers the screw and prevents its removal.

> **NOTE**: The security bracket can be used with a padlock to inhibit access to the interior of the workstation, which prevents unwanted configuration changes or component removal. For increased security, a cable lock can be installed to secure the workstation to a fixed object.

To install the security bracket, follow these steps:

1. Separate bracket A and bracket B by bending the metal back and forth where the two pieces join.
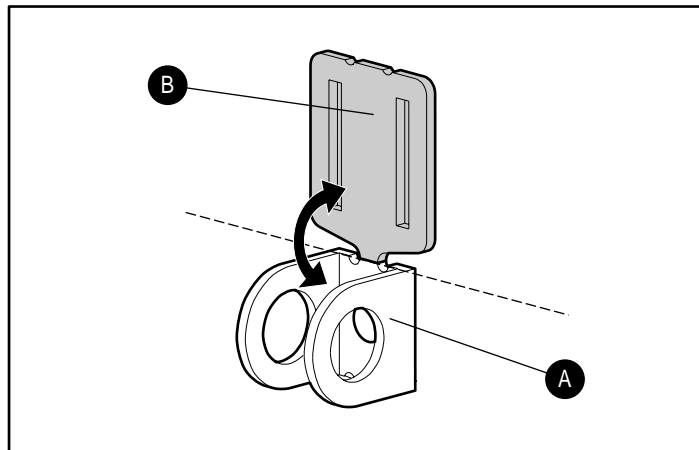
Figure 3-3.   Separating the security brackets

2. Insert the tab on bracket A into the notch on the rear of the workstation until the bracket is positioned flat against the workstation cover.

3. Align the hole on the flat portion of bracket A with the screw hole on the workstation cover.

4. Install the retaining screw provided in the cable lock kit.
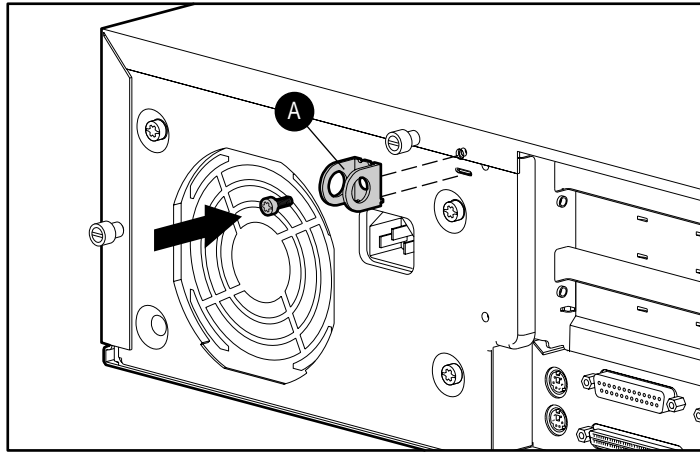
Figure 3-4.   Installing bracket A

5. Place bracket B over bracket A to cover the retaining screw.

6. Install a padlock (not provided) through bracket A to inhibit access to the interior of the workstation. Or, to inhibit access to the interior of the workstation and secure the workstation to a fixed object, install a cable lock (not shown).
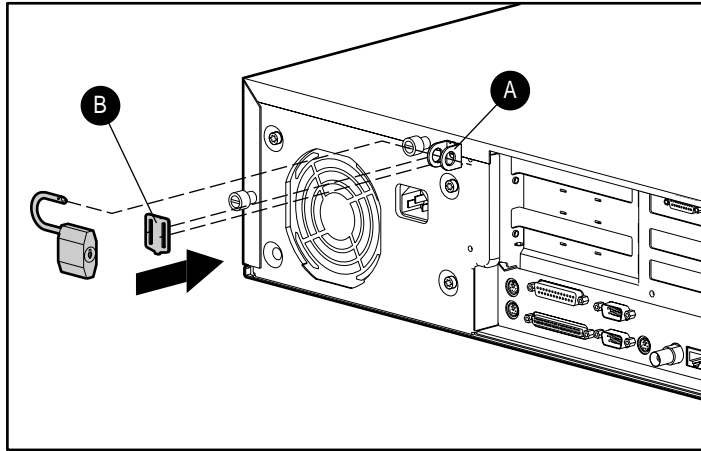
Figure 3-5.   Securing the workstation with a padlock

Chapter 4
Intelligent Manageability

Your workstation is equipped with the following Intelligent Manageability components:

■   Configuration Management

■   Asset Management

■   Compaq Insight Manager and Insight Management Agents

Configuration Management

Configuration Management features include:

■   ROM Flash

  ❏   Local

  ❏   Remote

  ❏   FailSafe Boot Block ROM

■   Remote Security Management

■   Remote Wakeup and Remote Shutdown

■   Establishing Power Management Settings

■   Enhanced Compaq Support Software CD kit and Compaq website

NOTE: Before using the Configuration Management features, you must establish a Setup Password.

ROM Flash

Your workstation comes with reprogrammable flash ROM (Read Only Memory). By establishing a Setup Password in Security Management, you can protect the ROM from being unintentionally updated or overwritten. This is important to ensure workstation operating integrity. Should you need or want to upgrade your ROM, you may:

■ Order an upgraded ROMPaq diskette from Compaq.

■ Order the *Compaq Support Software CD kit.*

■ Download the latest ROMPaq images from the Compaq website (http://www.compaq.com in the Compaq Services and Technical Help area under Downloadables).

> **IMPORTANT:**   To ensure maximum ROM protection, establish a Setup Password. A Setup Password prevents unauthorized ROM upgrades.

Local ROM Flash

To upgrade the ROM after you receive an upgraded ROMPaq diskette, follow these steps:

1. Insert the ROMPaq diskette in the diskette drive and boot the workstation.

2. Enter the Setup Password, when prompted.

   NOTE: If the Setup Password is entered correctly, the ROMPaq utility will take over and run the flash ROM upgrade. If the Setup Password is incorrectly entered, the procedure will terminate and no changes will be made to the ROM.

3. When the utility finishes upgrading the ROM, remove the diskette from the diskette drive and restart your workstation.

> **IMPORTANT:**   Do not turn off the power to your workstation until the ROMPaq utility has completed the upgrade process.

Remote ROM Flash

Remote ROM Flash allows the system administrator to upgrade the ROM safely on remote workstations, directly from the centralized network management console. Enabling the system administrator to perform this task remotely, on multiple workstations, results in a consistent deployment of and greater control over workstation ROM images over the network. It also results in greater productivity and lower total cost of ownership.

Compaq created the Remote ROM Flash capability to be secure and fail-safe. All workstation ROMPaq ROM images from Compaq are digitally signed to ensure authenticity and minimize potential corruptions. The ROM firmware includes a Boot Block that is protected during the flash process and allows the workstation to be restarted, in the unlikely event of an unsuccessful ROM flash.

Remote ROM Flash is performed in two stages:

1. System administrator uses the Remote Management Setup software on a centralized management console to prepare a workstation ROMPaq file.

2. System administrator uses a PC LAN management product, such as Microsoft SMS, Intel LANDesk Manager, or Symantec Norton Administrator for Networks, to distribute and execute the file over the network to remote workstations.

NOTE: Use of Remote ROM Flash requires an established Setup Password.

For more information on enabling Remote ROM Flash, refer to the online *Remote Management Administrators Guide* in the Remote Management setup utility. This utility is available as a SoftPaq on the Compaq website (http://www.compaq.com) in the Compaq Services and Technical Help area under Downloadables.

FailSafe Boot Block ROM

The FailSafe Boot Block ROM allows for system recovery in the unlikely event of a ROM flash failure, for example, if a power failure occurs during a ROM upgrade. The Boot Block is a flash-protected section of the ROM that checks to validate the system ROM each time power to the system is turned on.

■ If the system ROM is valid, the system starts normally.

■ If the system ROM fails the validation check, the FailSafe Boot Block ROM provides enough support to start the system from a Flash Recovery diskette, which will program the system ROM with a valid image. The Flash Recovery diskette is a SoftPaq downloadable from the Compaq website (http://www.compaq.com in the Compaq Services and Technical Help area under Downloadables).

> **IMPORTANT:** The workstation ships with the Diskette Boot feature enabled. If the Diskette Boot feature is disabled, the FailSafe Boot Block ROM will override the disabled feature to accommodate a FLASH recovery in the event a system ROM failure occurs.

Because there is no video or hard drive support from the Boot Block ROM, the keyboard lights communicate information. When the Boot Block detects an invalid system ROM, the system sounds a series of beeps (one long and three short) and flashes the three keyboard lights.

To recover the system after hearing the FailSafe Boot Block beeps, follow these steps:

1. Remove any diskettes from the diskette drive and turn off the power.

2. Insert the Flash Recovery diskette into the diskette drive.

3. Turn on power to the system.

    If a Setup Password has been established, the Caps Lock light will turn on.

4. Enter the Setup Password.

    When the system successfully starts from the diskette and reprograms the ROM, the following three keyboard lights will turn on.
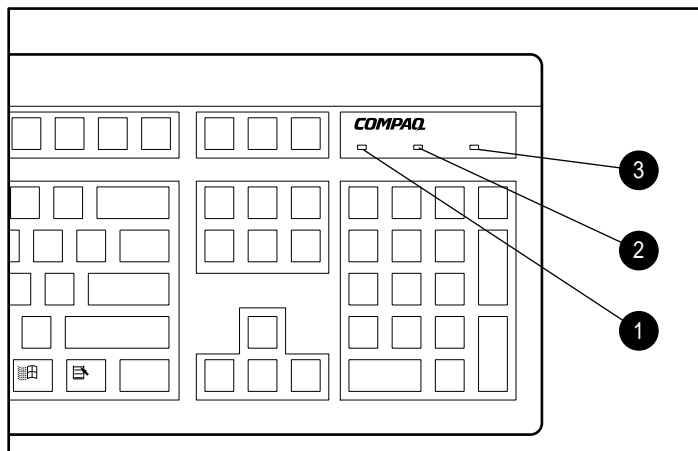
Figure 4-1.   Keyboard lights

The following table lists the various keyboard light combinations, as well as the meaning and action associated with each combination.

Table 4-1
Keyboard Lights

Num Lock ❶	Caps Lock ❷	Scroll Lock ❸	Meaning and Required Action
OFF	ON	OFF	System requires Setup Password.
			Enter the Setup Password. The light remains turned on until you enter a valid Setup Password.
ON	OFF	OFF	System could not start from diskette because the ROMPaq diskette is not present, is bad, or the drive is not ready.
			Insert a valid ROMPaq diskette, turn the power off, then turn the power on.

continued

Keyboard Lights *continued*

Num Lock ❶	Caps Lock ❷	Scroll Lock ❸	Meaning and Required Action
OFF	OFF	ON	ROM upgrade failed.
			Try another ROMPaq diskette. If the light remains turned on, contact Compaq customer support.
ON	ON	ON	ROM upgrade successfully completed.
			Turn power off and back on to resume normal system operation.

Remote Security Management

Remote Security Management allows the system administrator to safely set or modify security features on remote workstations, directly from the centralized network management console. Enabling the system administrator to perform these tasks remotely, on multiple workstations, results in consistent deployment of and greater control over workstation security parameters over the network. It also results in greater productivity and lower total cost of ownership.

Using the Remote Management Setup utility, the system administrator can perform the following remote features:

❑ Wakeup and Shutdown

❑ QuickLock and QuickBlank

❑ Serial and Parallel Interfaces

❑ Administrator Password

❑ Smart Cover Sensor

❑ Asset Tag

❑ QuickLock on Suspend

❑ Network Server Mode

❑ Diskette Boot and Diskette Write

Remote Security Management is performed in two stages:

1. System administrator uses the Remote Management Setup software on a centralized management console to define the security parameters.

2. System administrator uses a PC LAN management product to distribute the settings over the network to remote Compaq Workstation personal workstations.

For more complete information on Remote Security Management features, refer to the online *Remote Management Administrators Guide* in the Remote Management setup utility. This utility is available as a SoftPaq on the Compaq website (http://www.compaq.com in the Compaq Services and Technical Help area under Downloadables).

NOTE: Use of Remote Security Management requires an established Setup Password.

Remote Wakeup and Remote Shutdown

Remote Wakeup and Remote Shutdown allow a system administrator to power on and power off a client workstation from a remote location supported by PC LAN management tools. This enables cost-effective power consumption when the administrator needs to distribute software or update ROM.

NOTE: Third-party software tools may be required to remotely distribute software.

To enable Remote Wakeup:

1. Double-click the Network icon, located in the Control Panel.

2. Double-click the Compaq Netelligent 10/100 TX Embedded UTP Controller.

3. Select the Advanced Properties tab.

4. Select Remote Wakeup.

5. Change the value to ON.

6. Exit the Network control application.

Remote Wakeup support is available only when connected to the network via the RJ-45 connector.

For more information on using Remote Wakeup and Remote Shutdown, refer to the online *Remote Management Administrators Guide* in the Remote Management setup utility. This utility is available as a SoftPaq on the Compaq website (http://www.compaq.com in the Compaq Services and Technical Help area under Downloadables).

Establishing Power Management Settings

Use Computer Setup, accessible through the Compaq Utilities menu, to establish, modify, or disable Power Management features. Refer to Chapter 2 for procedural information.

NOTE: Disable monitor timeouts in Computer Setup first, then establish the settings in Windows NT to avoid potential conflicts. Use Display Properties to establish, modify, or disable Power Management settings for the monitor. To access Display Properties, right-click on the Windows NT desktop, then choose Properties.

Enhanced Compaq Support Software
CD Kit and Compaq Website

Compaq engineers rigorously test and debug software developed by Compaq and third-party suppliers. They develop operating-system specific support software, to ensure the highest level of performance, compatibility, and reliability for Compaq workstations.

■ When making the transition to new or revised operating systems, it is important to implement the support software designed for that operating system. If you plan to run any of the following operating systems on your computer, you must install corresponding Compaq device drivers and utilities to ensure all features are supported and functioning properly:

■ Microsoft Windows NT Workstation 3.51

■ Microsoft Windows NT Workstation 4.0

■ Microsoft Windows 95

Compaq has made locating, accessing, evaluating, and installing the latest support software easier. There are two methods you can use to access support software:

■ You can order the *Compaq Support Software CD kit.* This compact disc contains the latest device drivers, utilities, and flashable ROM images needed to run your workstation.

■ You can download the software from the Compaq website (http://www.compaq.com in the Compaq Services and Technical Help area under Downloadables).

NOTE: Both the CD and the web site include *The Locator* with *Decision Support,* a comprehensive listing of the device drivers, utilities, flashable ROM images, and more, categorized by operating system, computer family, and model for easy retrieval. *Decision Support* provides detailed information for each piece of support software, including descriptions, features, enhancements, dependencies, and update criticalities.

If you choose to purchase the *Compaq Support Software CD kit,* you have two options:

■ You can purchase a single CD-ROM kit that gives you one-time access to the latest support software.

■ You can purchase a yearly subscription that delivers up to 12 monthly CD-ROMs.

The annual subscription ensures your continuous access to the latest developments.

NOTE: If you call Compaq to place an order, be sure to have the serial number of your workstation available. The serial number is located on the rear of the workstation. This number is necessary for all purchases.

Compaq Integrated Software

The *Compaq Support Software CD kit* and the Compaq website (http://www.compaq.com) include bundles of appropriate support software ready for automated installation on top of an off-the-shelf Microsoft operating system. You can use these software bundles to quickly and easily install the correct Compaq Professional Workstation 5100 device drivers and other software required for top performance.

Asset Management

Compaq Diagnostics for Windows NT

Compaq Diagnostics for Windows NT is a component of Intelligent Manageability that allows you to view:

- System overview

- Asset Control information

- Input devices

- Communications ports

- Storage devices

- Graphics information

- Memory configuration

- Security Management settings

- System Health

- Operating system

- Windows version

Using Compaq Diagnostics for Windows NT

To use Compaq Diagnostics for Windows NT:

1. Double-click the Compaq Diagnostics for Windows NT icon located in the Control Panel.

   The screen displays an overview of the computer hardware and software.

2. For specific hardware and software information, select a category from the Category menu or from the toolbar.

   As you move your cursor over the toolbar icons, the corresponding category names appear near the cursor.

3. To display more detailed information in a selected category, click More in the Information Level box.

   Categories or items of information displayed by Compaq Diagnostics for Windows NT are similar to, but may vary slightly from, the information presented in the View System Information (INSPECT).

4. Review, print, and, if necessary, discuss this information with your authorized Compaq reseller or service provider.

5. To print the information, click File, then select Print.

6. Select one of the following options:

   ❏ Detailed Report (All Categories)

   ❏ Summary Report (All Categories)

   ❏ Current Category.

7. Click OK to print the report you selected.

8. To exit Compaq Diagnostics for Windows NT, click File, then click Exit.

Compaq Insight Manager and Insight Management Agents

Using the industry-standard Simple Network Management Protocol (SNMP) found in Windows NT Workstation, Compaq has continued the migration of management tools from servers to desktops by enhancing Compaq Insight Manager. Compaq Insight Manager allows the LAN administrator to remotely view asset control data, configuration data, memory change alerts, NIC performance data, and contact information. The tools also provide access to the fault management features of the Compaq Professional Workstation 5100.

For more information on integrating with Compaq Insight Manager and configuring the Compaq Insight Management Agents, refer to the *Compaq Management CD Overview* on the Management CD available with every Compaq Professional Workstation.

Chapter 5
Network Communications

This chapter provides information about networks and the hardware connectors and software device drivers that allow you to access a network. Once your network connection is active, you can share resources such as a printer, exchange information from device to device, and run common software programs.

Your workstation comes Ethernet network ready, which means that it has an integrated network controller and network device drivers on the Compaq SmartStart for Workstations CD. The Compaq Netelligent 10/100 TX Embedded UTP/Coax Controller with Remote Wakeup support is a PCI bus mastering dual speed 10BaseT standard 100BaseTX controller that will automatically detect network connection speed and adjust accordingly. The controller supports full duplex Ethernet, allowing two-way transmission between nodes for up to 20 or 200 Mbits/sec aggregate bandwidth.

NOTE: Your workstation is also Token Ring Network-capable. To connect to a Token Ring Network, you must install a Token Ring board.

Identifying the Ethernet Connectors

The following Ethernet connectors are located on the rear panel of the workstation:

■ RJ-45 (8-pin) connector ❶

■ BNC (thin-coax cable) connector ❷
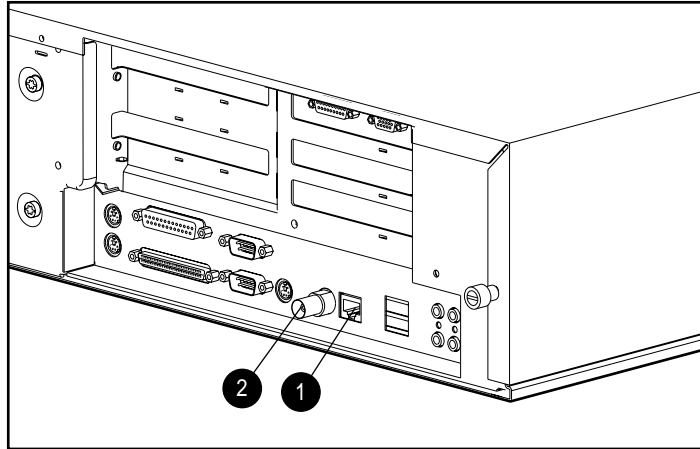
Figure 5-1. Identifying the Ethernet connectors

> ⚠ **WARNING:** To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telecommunications/ telephone connectors into the network interface controller (NIC) receptacles.

Connecting to an Ethernet Network

Two types of network connectors are included on your workstation. Each type requires different equipment and installation procedures as explained in the following sections.

> **IMPORTANT:** To avoid configuration problems, do not attempt to utilize the RJ-45 and BNC connectors simultaneously.

Attaching a Network Cable to the RJ-45 Connector

To connect a network cable to the RJ-45 connector:

1. Insert one end of the network cable into the main network connection.

2. Insert the other end into the RJ-45 connector on your workstation.

3. Ensure both connectors are properly secured.

> **IMPORTANT:** If you are connecting to a 100BaseTX network, you must use a Category 5 UTP cable.
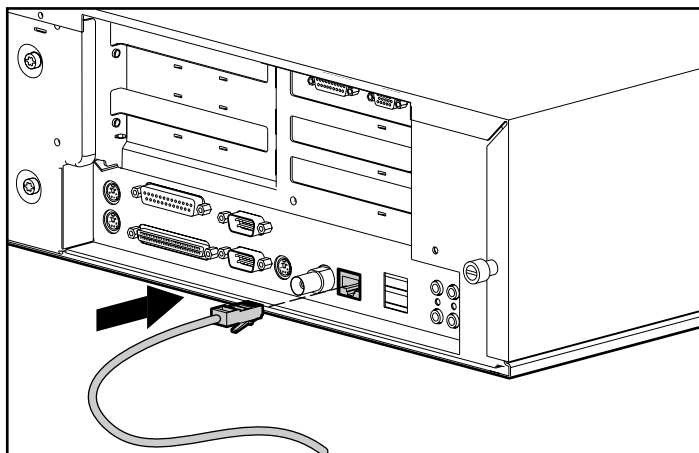
Figure 5-2.   Attaching the network cable to the RJ-45 connector

Attaching a Network Cable to the BNC Connector

Workstations networked via a BNC connection are daisy-chained. Depending on where each workstation falls within the chain sequence, the procedures for connecting them differ. The following figure illustrates the chaining process.

Each workstation in the sequence is connected to its nearest neighbor using a "T" connector ❶. The workstations on both ends of the chain require a "T" connector and a Terminator ❷.
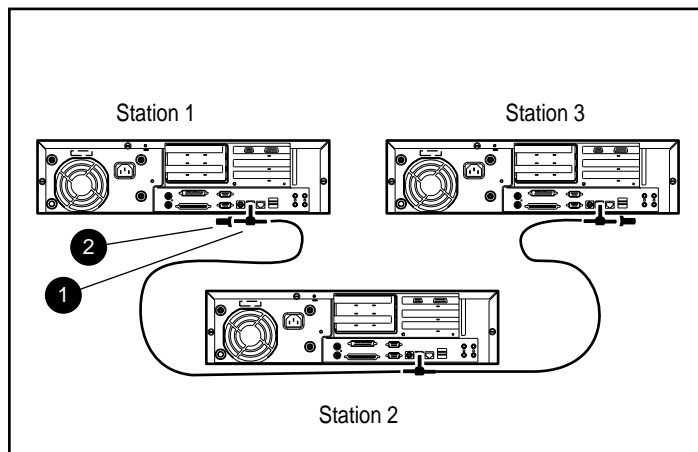
Figure 5-3.   Daisy chain configuration

Installing the Network Drivers

The device drivers in the network software enable the workstation to communicate with the network. For information about installing drivers, operating systems, and other support software, see the *Software Installation Guide* included with your workstation.

Changing the Default Configuration

To change the default configuration settings, run the Setup utility. See Chapter 2 for more information.

Chapter 6
CD-ROM Drive and PremierSound Audio System

Your workstation includes a 24X Max CD-ROM drive (IDE) and a PremierSound Audio System. The CD-ROM drive is a random-access, read-only storage device capable of retrieving data from a removable compact disc. The PremierSound Audio System provides sound capabilities for increased productivity in the Microsoft Windows NT operating environment.

Using the Slot-Load CD-ROM Drive

1. Turn on the workstation, if it is not already on.

2. Hold the compact disc by the edges, label side up, being careful not to touch the flat surfaces of the disc.

3. Insert the compact disc straight into the slot. Discs inserted at an angle may not be accepted.
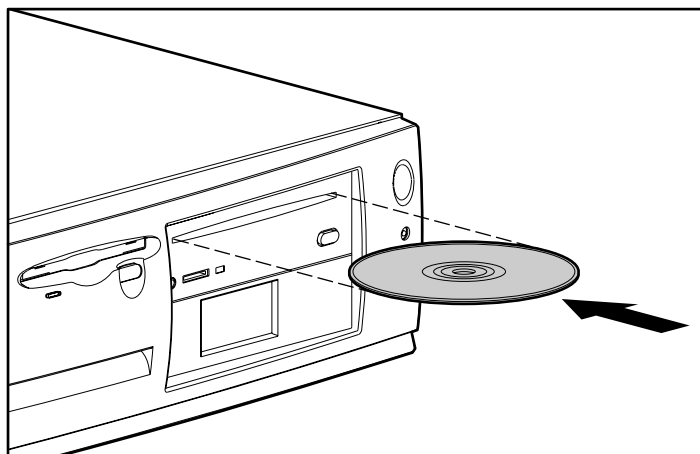
Figure 6-1.   Inserting a CD into CD-ROM drive

The drive performs a diagnostic check and automatically begins reading the table of contents (TOC). The busy indicator turns amber while the drive reads the TOC.

NOTE: The compact disc is automatically ejected if the disc is upside down or if any other condition prevents the drive from reading the disc.

When the busy indicator turns green, the drive is ready to receive commands and data may be retrieved from the disc.

4. To remove the compact disc, press the Eject button.

IMPORTANT: Certain applications or operating system software may disable the Eject button to prevent accidental damage to the disc. If the Eject button is disabled by the application software, it will not operate.

CAUTION: Do not apply labels to CDs. With 24X and faster CD-ROM drives, the presence of a label causes the CD to be unbalanced and may cause either inconsistent operation or failure of the drive.

Using CD-ROM Software

The first time you use a software program that comes on a compact disc, it may load a certain amount of program data onto the hard drive of your workstation. This enables the program to run more efficiently and quickly in the future.

NOTE: Some software compact discs take control of the hardware volume controls. If this occurs, adjust the sound before starting the software.

Read the software manufacturer's instructions that accompany the compact disc before you attempt to use it. Information to look for includes:

■ How much hard disk space will this program require? Do you have enough disk space?

■ Will you activate the disc from Windows NT or from the system prompt?

■ Have you connected any special devices this program requires, such as a joystick?

■ Do you have the required information (such as serial number) available to answer any questions during the setup program?

Using Audio Compact Discs

To play an audio CD, follow these steps:

1. Select Programs from the Start button.

2. Then select Multimedia from the Accessories menu.

3. Click CD Player, found in the Accessories group box, to control audio compact disc play.

Information on using CD Player can be found in the online help for that utility.

CD-ROM Drive Precautions

To ensure that the CD-ROM drive operates properly, observe the following precautions:

■ Do not move the drive during operation. This may cause it to malfunction during reading.

■ Avoid exposing the drive to sudden changes in temperature, as condensation may form inside the unit. If the temperature suddenly changes while the drive is on, wait at least one hour before you turn off the power. If you operate the unit immediately, it may malfunction while reading.

■ Avoid placing the drive in a location that is subject to high humidity, extreme temperatures, mechanical vibration, or direct sunlight.

■ Clean the panel and controls with a soft, dry cloth or a soft cloth lightly moistened with a mild detergent solution. Never spray cleaning fluids directly on the unit.

■ Avoid using any type of solvent, such as alcohol or benzene, which may damage the finish.

■ If any object or liquid falls into the slot, immediately unplug the workstation and have it checked by an authorized Compaq service provider.

PremierSound Audio System

The PremierSound audio system included on your workstation allows you to integrate voice messages and music directly into your files. Using the supplied microphone, you can record sounds as data on the hard drive. This sound data may be used in many ways, for example; you can enhance presentation data with voice and music.

If you choose to upgrade your audio system, you must disable the integrated audio controller:

> **IMPORTANT:**   Do not remove the ESS 1868 driver from the Drivers window in the Control Panel. Follow the instructions below.

1. From the Control Panel in Windows NT, select Devices.

2. From the Devices window, select the AudioDrive device.

3. Select the Stop button to stop the AudioDrive device.

4. Select the Startup button.

5. Select Disabled as the Startup Type for the AudioDrive.

6. Select OK.

7. Close the Devices window.

8. Restart the workstation for the changes to take effect.

9. Proceed with the installation process for your upgrade audio controller board.

Chapter 7
Hardware Upgrade Preparations

This chapter explains how to access the workstation and to prepare for the installation of optional hardware upgrades. Information about reconfiguring the workstation is also discussed to ensure that newly installed components are recognized by your system. This chapter also identifies all internal components.

To install the following upgrades, see the related chapter.

■   Memory (Chapter 8)

■   Drives (Chapter 9)

■   Expansion Boards (Chapter 10)

■   Graphics Controllers (Chapter 11)

■   Processors (Chapter 12)

Installation Sequence

Below is an overview of the installation and configuration sequence. Follow this sequence of steps to ensure the proper installation of any optional equipment. Before you begin, observe the following precautions:

⚠	**WARNING:** To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telecommunications/ telephone connectors into the network interface controller (NIC) receptacles.

⚠	**WARNING:** To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

△	**CAUTION:** Static electricity can damage the electronic components of the workstation or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. Refer to Appendix D for more information.

1. If the workstation is already on, turn it off and disconnect the power cord from the wall outlet.

2. Open the workstation by removing its outside cover and front bezel. Refer to the sections "Removing the Workstation Cover" and "Removing the Front Bezel" in this chapter for instructions.

3. Install any optional equipment (ISA or PCI expansion board, processor upgrade, memory, or drive). Refer to the applicable chapters in this manual or the documentation provided with the optional equipment for instructions.

4. Replace the front bezel and workstation cover.

5. Plug in the power cord to a grounded AC outlet.

6. Turn on the monitor, workstation, and any devices you want to test.

7. Reconfigure the workstation, if necessary. Refer to Chapter 2 for instructions.

8. Test the workstation (optional) using the TEST utility.

Reconfiguring the Workstation

System configuration is the process of specifying the devices and programs that make up a system. When you add or remove optional equipment, you must reconfigure the workstation to recognize these changes.

Run the Computer Setup utility *after* you complete the installation. To configure in Windows NT, use Control Panel and configure your specific option.

If configuration settings are incorrect, one or more devices may not work properly, and you may receive an error message. If this occurs, run the Computer Setup utility again. See Chapter 2 for more information on Computer Setup.

Removing the Workstation Cover

To install optional components, you must remove the workstation cover to gain access to the drive positions or expansion slots you want to use.

> ⚠ **CAUTION:**   Before removing the workstation cover, make sure that the workstation is turned off and that the power cord is disconnected from the electrical outlet.

To remove the workstation cover:

1. Turn off the workstation and any external devices.

2. Disconnect the power cord from the electrical outlet.

3. Loosen the thumbscrews on the rear panel of the workstation.
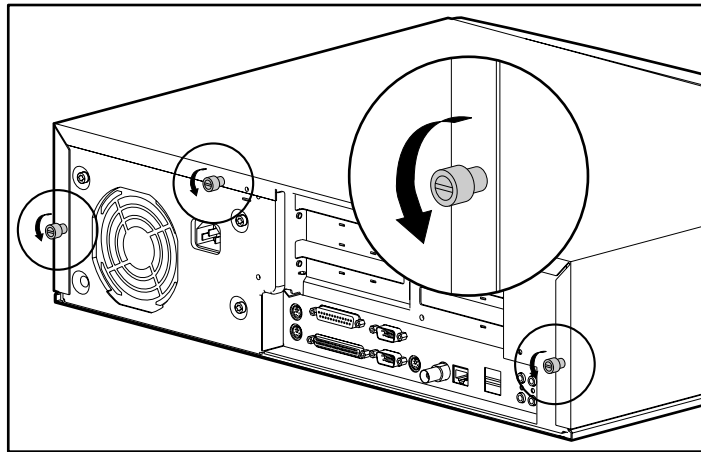
Figure 7-1.   Loosening the thumbscrews

4. Rotate the back of the workstation cover up and remove the front lip of
    the cover from under the front bezel to remove the cover.

    NOTE: The hood labels located on the underside of the workstation cover
    provide information on changing switch settings, and installing additional
    DIMMs or expansion boards.
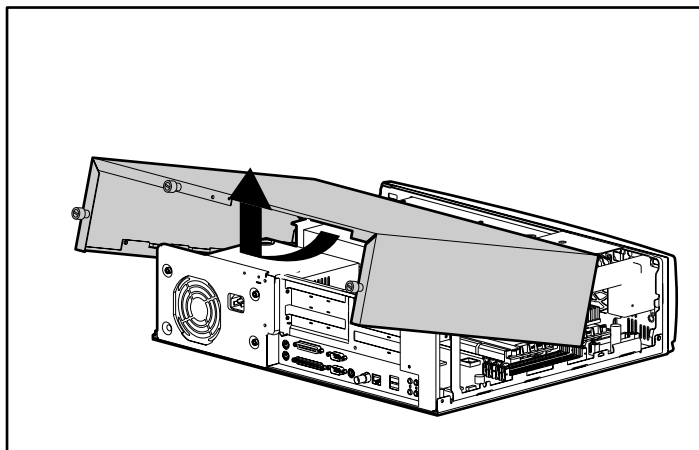
Figure 7-2.   Removing the workstation cover

Removing the Front Bezel

To install optional drives, remove the front bezel to gain access to the slide-out drive cage.

> ⚠ **CAUTION:**   Before removing the workstation cover and front bezel, ensure that the workstation is turned off and that the power cord is disconnected from the electrical outlet.

To remove the front bezel:

1. Turn off the workstation and any external devices.

2. Disconnect the power cord from the electrical outlet.

3. Remove the workstation cover.

4. Press up on the top release latches. (Press down on the bottom release latches.)
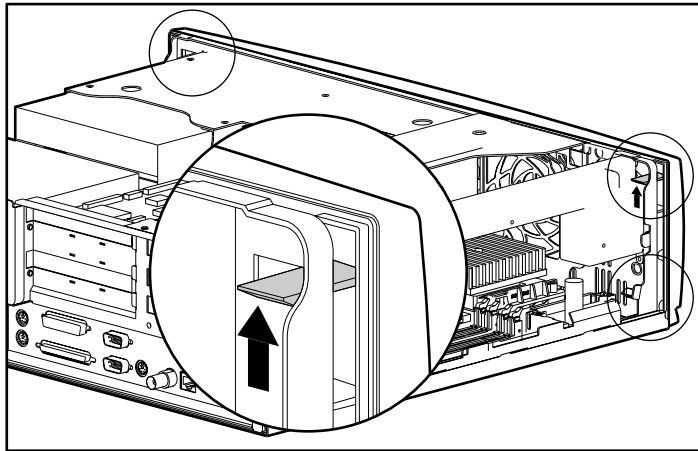
Figure 7-3.   Locating the front bezel release latches

5. Pull the front bezel straight off the chassis.
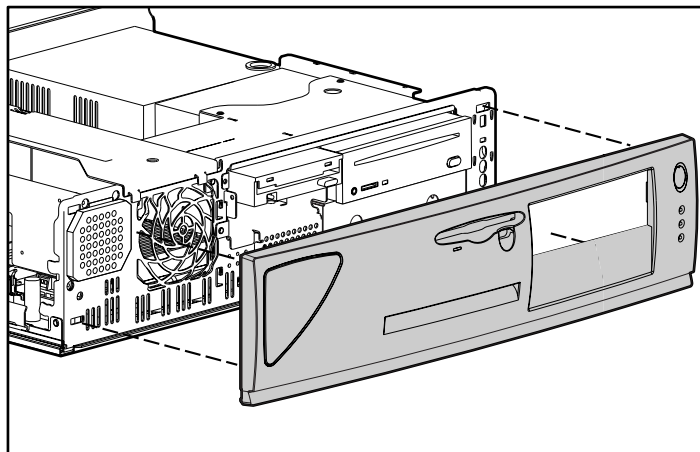
Figure 7-4. Removing the front bezel

Identifying Internal Components

The following illustration and table identify the internal components of your workstation.
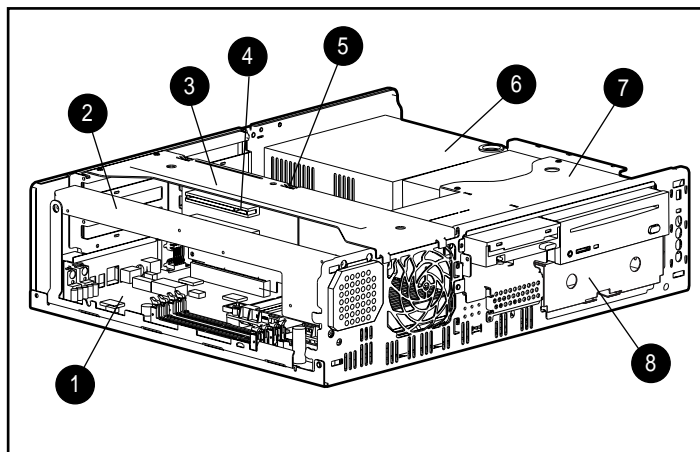
Figure 7-5. Identifying internal components

Table 7-1
Internal Components

Ref.	Component
1	System Board Tray
2	Speaker Baffle
3	Expansion Board Cage
4	PCI/ISA Slots
5	Smart Cover Sensor
6	Power Supply
7	Drive Cage
8	EMI Shield

Removing the EMI Shield

If you are installing a drive in the slot below the CD-ROM drive, you will need to remove the EMI shield first.

1. Remove the two screws that connect the EMI shield to the drive cage.

    IMPORTANT: Do not remove the guide screws. They are for alignment only.

2. Slide the EMI shield out of the drive slot.
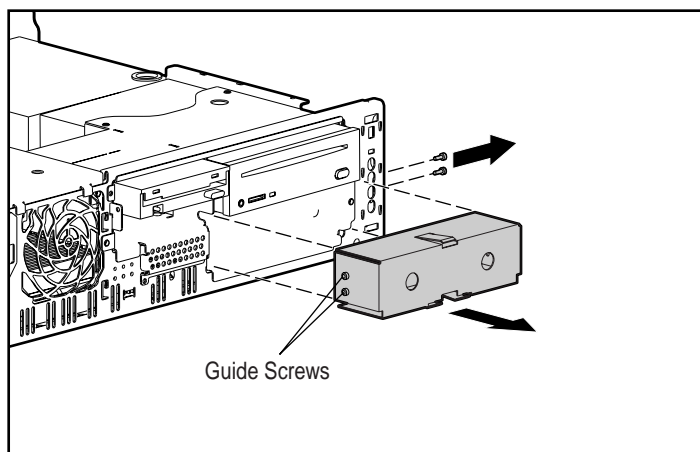
Figure 7-6.   Removing the EMI Shield

Extending the Drive Cage

The slide-out drive cage allows access to all drive positions for easy installation of additional drives, with no drive rails or brackets required. With the drive cage slightly extended from the chassis, you can easily connect the drive power and signal cables.

> **NOTE**:   When installing optional drives, you must install one guide screw to ensure the drive will line up correctly in the drive cage. Compaq has provided extra guide screws, installed in the front of the workstation chassis, behind the front bezel.

CAUTION: Before removing the workstation cover and front bezel, make sure that the workstation is turned off and that the power cord is disconnected from the electrical outlet.

To slide out the drive cage:

1. Turn off the workstation and any external devices.

2. Disconnect the power cord from the electrical outlet.

3. Remove the following components:

   ❑   workstation cover

   ❑   front bezel

4. Remove the screws securing the drive cage to the front of the workstation chassis.

5. Grasp the front of the drive cage, then slide the drive cage out of the chassis about 4 inches (10 cm).
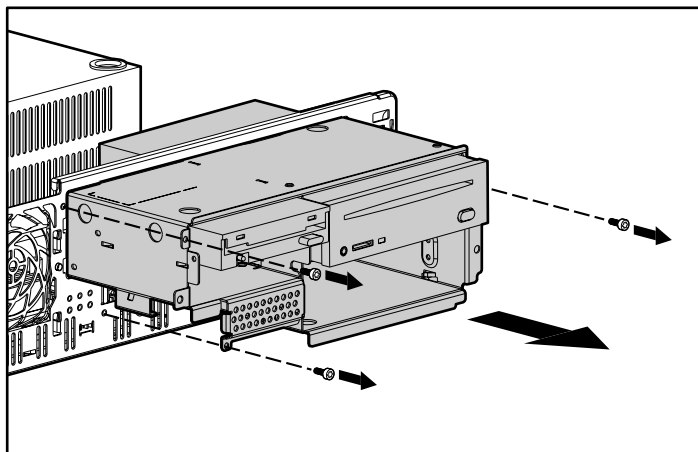
Figure 7-7.   Extending the drive cage

Removing the Speaker and Baffle

Your workstation comes with an integrated/ported audio speaker and baffle that take advantage of the PremierSound audio system.

NOTE: It is not necessary to remove the speaker and baffle assembly unless you are installing or removing a full height ISA expansion board. For procedures on installing or removing a full height ISA expansion board, refer to the applicable sections under "Installing an Expansion Board" later in this chapter.

To remove the speaker and baffle assembly:

1. Remove the following components:

    ❏   workstation cover

    ❏   front bezel

2. Remove the four T-10 torx screws securing the front of the speaker to the chassis.

3. Remove the T-10 torx screw from the rear of the speaker baffle.
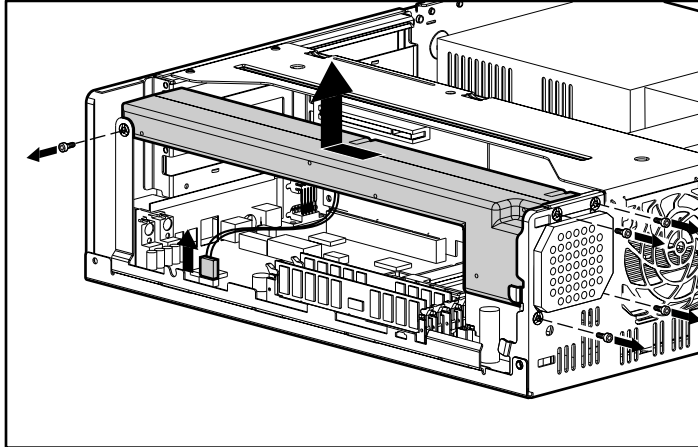
Figure 7-8.   Removing the speaker and baffle

4. Disconnect the speaker cable from the system board.

5. Lift the assembly from the chassis.

6. To replace the assembly, reverse steps 1-5.

> ⚠ **CAUTION:**   When handling the speaker, take care not to damage the speaker baffle.

IMPORTANT: When replacing the speaker, make sure the rear retaining screw firmly clamps the speaker baffle to the chassis.

Removing the Expansion Board Cage

The removable expansion board cage allows quick removal of expansion boards, without disconnecting the cables attached to the connectors on the boards, and without the use of tools. With the expansion board cage removed from the chassis, you can easily access the system board.

To remove the expansion board cage:

1. Turn off the workstation and any external devices.

2. Disconnect the power cord from the electrical outlet.

3. Remove the workstation cover.

> △ **CAUTION:**   The power supply in the Compaq Professional Workstation 5100 contains an auxiliary power section. Make sure the power switch is off and the unit is unplugged before removing the I/O bracket assembly in the following step.

4. Grasp the expansion board cage firmly with both hands, one hand on back and one hand on front, then pull up and out to remove it from the chassis.
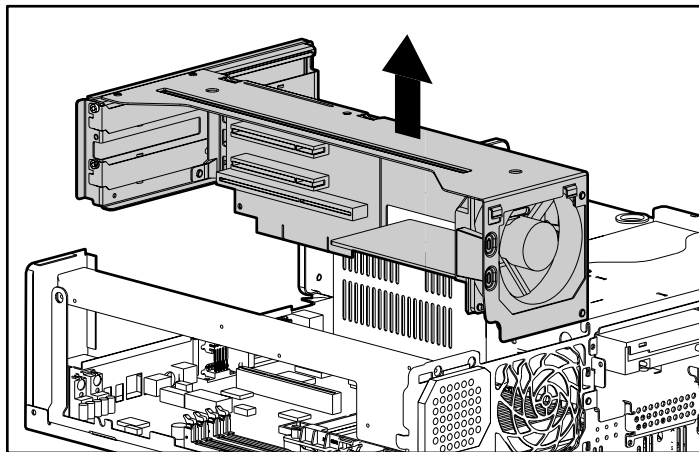
Figure 7-9.   Removing the expansion board cage

Important Guidelines for Expansion Board Cage Replacement

To replace the expansion board cage, you **MUST** follow these steps:

1. Grasp the cage and insert it into the connector on the system board. Make sure it is fully seated in the connector.

2. Plug in the power cord, but **DO NOT** turn on the power switch.

   The auxiliary power section of the power supply should now be active. When the auxiliary power is active and the expansion board cage is seated properly, a green LED on the backplane board is lit. The LED can be viewed through a portal ❶ on top of the expansion board cage.

   If the LED is **NOT** lit, the expansion board cage is **NOT** seated properly. Reseat the cage.

   ⚠ **WARNING:** DO NOT turn on the power switch unless the expansion board cage is seated properly. For safety, DO NOT turn on the power switch until the workstation is completely reassembled.
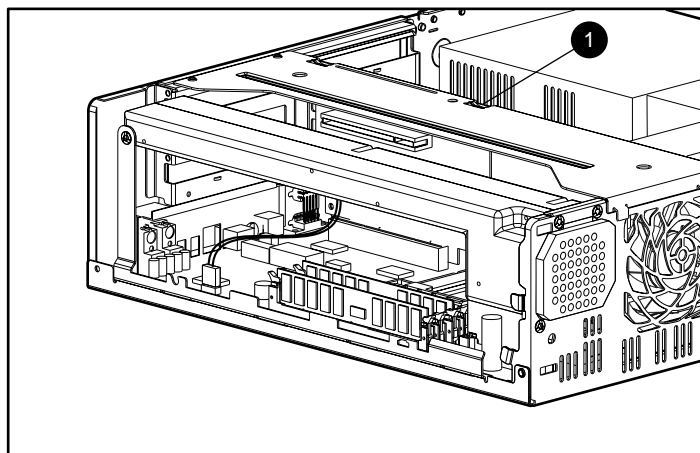
Figure 7-10. Locating the portal to view the green LED light

3. Reassemble the workstation.

Removing the System Board Tray

The slide-out system board tray allows you to quickly remove the system board without using tools.

> ⚠ **CAUTION:** Before removing the workstation cover, ensure that the workstation is turned off and that the power cord is disconnected from the electrical outlet.

To remove the system board tray:

1. Turn off the workstation and any external devices.

2. Disconnect the power cord from the electrical outlet.

3. Remove the workstation cover.

4. Remove the expansion board cage.

5. Disconnect all cables from the system board, and disconnect any external device cables from the rear panel.

6. Grasp the back edge of the system board tray and slide it out of the chassis.
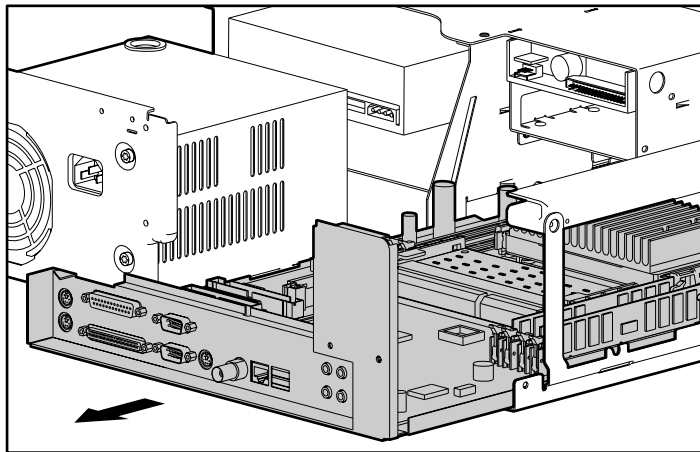
Figure 7-11.   Removing the system board tray

> **IMPORTANT:** Before replacing the expansion board cage, read "Important Guidelines for Expansion Board Cage Replacement" earlier in this chapter.

Identifying System Board Components

The following illustration and table identify the system board components of your workstation.
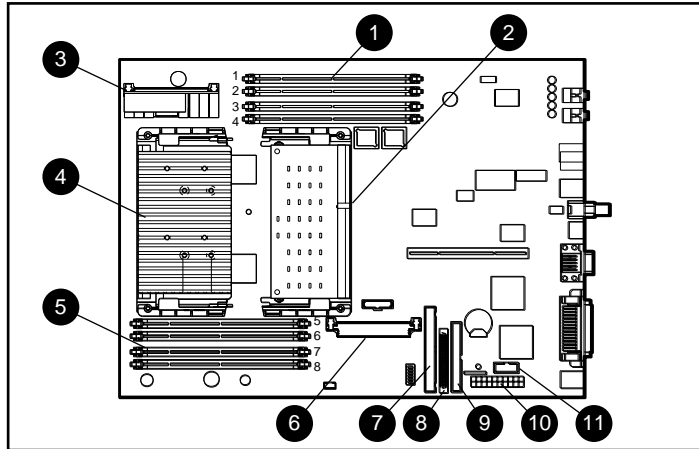
Figure 7-12. Identifying system board components

Table 7-2
System Board Components

Ref.	Component
1	DIMM Slots 1-4
2	Secondary Processor Slot (Terminator board installed in slot in single-processor system)
3	Processor Power Module (for Primary Processor)
4	Primary Processor
5	DIMM Slots 5-8
6	Processor Power Module Slot (for Secondary Processor)
7	IDE Connector
8	SCSI Connector
9	Diskette Drive Connector
10	Power Connector
11	Power Switch and LED Header

Chapter 8
Memory Upgrades

This chapter explains how to install additional memory and illustrates the best physical configurations when installing memory.

For information on preparing the workstation for upgrades, see Chapter 7.

Installing Additional Memory

Your workstation supports 60-ns ECC, EDO buffered dual inline memory modules (DIMMs). Additional DIMMs (16-MB, 32-MB, 64-MB, 128-MB, or 256-MB) are available to upgrade the memory. The workstation has eight DIMMs slots located on the system board that support up to a maximum of 512-MB.

The following figure illustrates the physical location of all DIMM slots and the corresponding table provides the proper configuration when installing DIMM pairs.

IMPORTANT: Before installing additional DIMMs, read "Important Guidelines for DIMM Installation" in the following section.
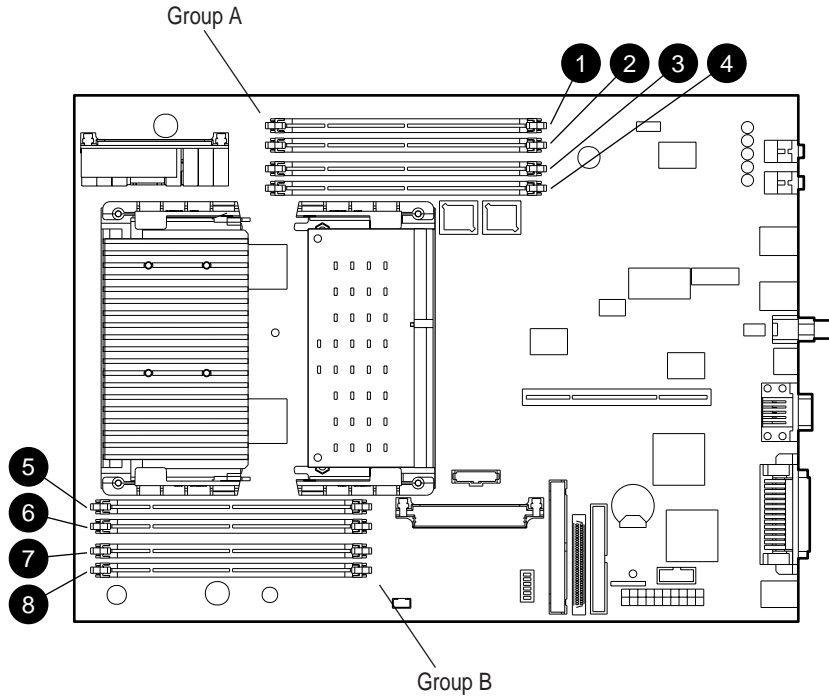
Figure 8-1.   Overview of DIMM slots

Table 8-1
DIMM Slot Configurations

DIMM Pair Installation	Group A (Slots 1-4)				Group B (Slots 5-8)			
	1	2	3	4	5	6	7	8
1st pair	X		X					
2nd pair	O		O		X		X	
3rd pair	O	X	O	X	O		O	
4th pair	O	O	O	O	O	X	O	X

X = Pair being installed
O = Existing Pair (previously installed)

The table illustrates a progressive installation of DIMMs that ensures optimal system performance. Based on this example, DIMM pairs are installed as follows:

■ The first pair of DIMMs in slots 1 and 3 (Group A)

■ The second pair of DIMMs in slots 5 and 7 (Group B)

   NOTE: You can install the second pair in slots 2 and 4 (Group A), but it is not recommended. Optimal performance is achieved only when alternating DIMM pairs between Groups A and B.

■ The third pair of DIMMs in slots 2 and 4 (Group A)

■ The fourth pair of DIMMs in slots 6 and 8 (Group B)

Important Guidelines for DIMM Installation

When installing DIMMs, you **MUST** follow these guidelines:

■ Use only 16-, 32-, 64-, 128-, or 256-MB, ECC, EDO-buffered DIMMs. DIMMs should be 60-ns. The workstation will support DIMMs with a speed of 50-ns, however, it is recommended that only 60-ns DIMMs are installed. Since the memory timing registers can support only one configuration, the entire memory subsystem will operate at a 60-ns speed.

■ DIMMs must have a 4-KHz refresh rate.

■ **DO NOT INSTALL DIMMS THAT DO NOT SUPPORT ERROR CHECKING AND CORRECTING (ECC).** Use only 3.3 volt, ECC, EDO-buffered DIMMs. Non-compatible DIMMs may adversely affect data integrity.

■ A DIMM can be installed one way only. Be sure to match the two *key slots* on the DIMM with the tab on the DIMM slot. Push the DIMM down into the DIMM slot, ensuring that it is fully inserted and properly seated.

■ When upgrading, do not exceed 512 MB total. Upgrades exceeding 512 MB will cause the system to halt.

■ DIMMs must be added in pairs and each DIMM in a pair must be the same size.

■ **DO NOT INSTALL ANY ONE PAIR OF DIMMS IN <u>ADJACENT DIMM SLOTS.</u>**

> **IMPORTANT:**   The system will **NOT** boot if you install DIMMs in adjacent slots. DIMMs must be installed in alternating (every other) DIMM slots.

■ Better performance can be achieved by alternating the installed DIMM pairs between DIMM slots 1-4 and 5-8. In doing so, both memory controllers are utilized by the system.

> **NOTE**:   If you must replace a DIMM module to upgrade your memory, see "Removing DIMM Modules" later in this chapter for instructions.

Installing DIMM Modules

⚠ **CAUTION:** When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

⚠ **CAUTION:** Static electricity can damage the electronic components of the workstation or optional boards. Before beginning these procedures, make sure that you are discharged of static electricity by briefly touching a grounded metal object. See Appendix D, "Electrostatic Discharge," for more information.

IMPORTANT: Before installing additional DIMMs, read "Important Guidelines for DIMM Installation" in the previous section.

To install a memory module:

1. Turn off the workstation.

2. Disconnect the power cord from the electrical outlet.

3. Remove the workstation cover.

4. Disconnect all cables from the system board.

5. Remove the following components:

   ❑ expansion board cage

   ❑ system board tray

6. Position the memory module ❶ in the memory socket on the system board, making sure that the two gaps between the contacts are in alignment with the two spaces in the socket.

7. Press down on both ends of the module simultaneously to seat it in the socket. When the module is fully seated, the latches ❷ automatically lock it in position.
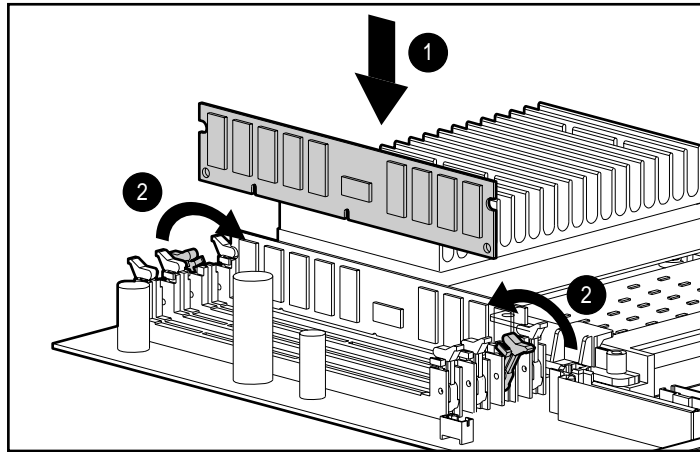
Figure 8-2.   Installing a DIMM module

8. Repeat steps 6 and 7 for each module that you want to install. You MUST install DIMMs in pairs.

9. Slide the system board tray back in.

10. Reconnect the cables to the system board.

11. Reassemble the workstation.

> **IMPORTANT:**   Before replacing the expansion board cage, read "Important Guidelines for Expansion Board Cage Replacement" in Chapter 7.

12. Test the system (optional) using the Computer Checkup (TEST) utility. See Chapter 2 for instructions.

Removing DIMM Modules

To remove a memory module:

1. Turn off the workstation.

2. Disconnect the power cord from the electrical outlet.

3. Remove the workstation cover.

4. Disconnect all cables from the system board.

5. Remove the following components:

    ❏ expansion board cage

    ❏ system board tray

6. Press outward on both latches ❶ of the DIMM module at the same time. This releases the DIMM and partially pushes it out of the socket.

7. Lift the DIMM ❷ straight out of the socket.
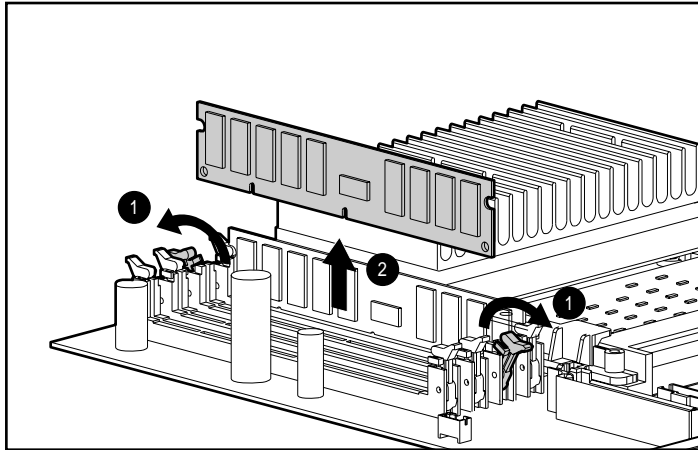
Figure 8-3.   Removing a DIMM module

8. Repeat steps 6 and 7 for each module that you want to remove. You MUST remove DIMMs in pairs if you are permanently removing the DIMMs or if you are upgrading DIMMs.

9. Slide the system board tray back in.

10. Reconnect the cables to the system board.

11. Reassemble the workstation.

> **IMPORTANT:** Prior to replacing the expansion board cage, read "Important Guidelines for Expansion Board Cage Replacement" in Chapter 7.

12. Test the system (optional) using the Computer Checkup (TEST) utility. See Chapter 2 for instructions.

Chapter 9
Drives

This chapter explains how to install additional hard drives, CD-ROM drives, tape drives, diskette drives, and PD-CD drives. This chapter also provides guidelines for installing SCSI devices.

For information on preparing the workstation for upgrades, see Chapter 7.

Installing Additional Drives

The Compaq Professional Workstation 5100 supports up to five drive bays:

- **Bay 1**—supports a third-height device. A standard 3.5-inch diskette drive is shipped in Bay 1.

- **Bay 2 (Internal)**—supports a third-height (1.0") hard drive.

- **Bay 3**—supports a third-height or half-height device. A standard CD-ROM drive is shipped in Bay 3.

- **Bay 4**—supports a half-height device. An optional PD-CD drive, CD-ROM drive, or tape drive can be installed in Bay 4.

- **Bay 5 (Internal)**—supports a third-height (1.0") or half-height (1.6") hard drive.

Your workstation ships with a 2.1-GB, 4.3-GB, or 9.1-GB Wide-Ultra SCSI hard drive. Hard drives are shipped in various bay configurations. Due to its height, however, the 9.1-GB hard drive must be shipped or installed in Bay 5.

> **NOTE**: Additional hard drives may be installed in Bays 3 and 4, but these positions are more often used for devices requiring user access.
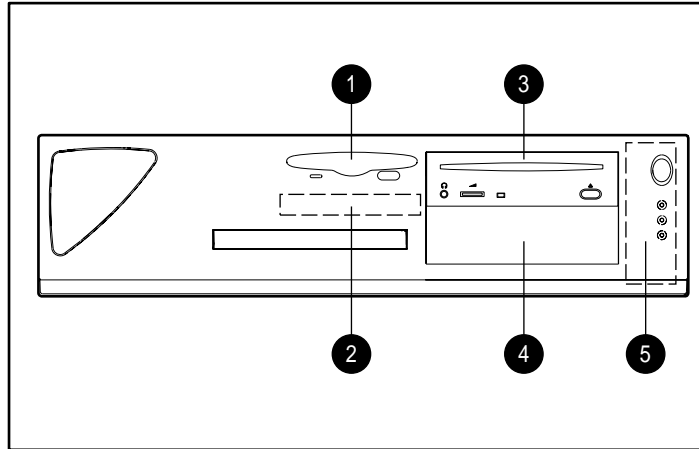
Figure 9-1.   Identifying drive configurations

Removing a Blank Drive Bezel

To remove a blank drive bezel:

1.   Turn off the workstation.

2.   Disconnect the power cord from the electrical outlet.

3.   Remove the workstation cover and front bezel.

4.   Press in on the tab ❶ on the right side of the drive bezel, then remove drive bezel ❷.
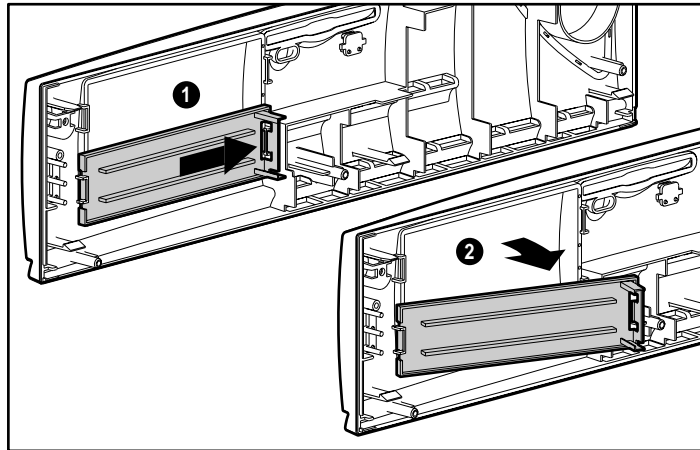
Figure 9-2.   Removing a drive bezel

Installing a 9.1-GB Hard Drive

The 9.1-GB (1.6") Wide-Ultra SCSI hard drive ships standard on some models and is optional on others. The 9.1-GB hard drive must be installed in Bay 5 only. Bay 5 is an internal bay (bracket) located to the right of the drive cage.

To install a 9.1-GB (1.6") hard drive:

1.   Turn off the workstation

2.   Disconnect the power cord from the electrical outlet.

3.   Remove the workstation cover.

4. Loosen the screw securing the hard drive bracket to the chassis ❶.

5. Slide the bracket back towards the rear of the workstation, then remove the bracket ❷.
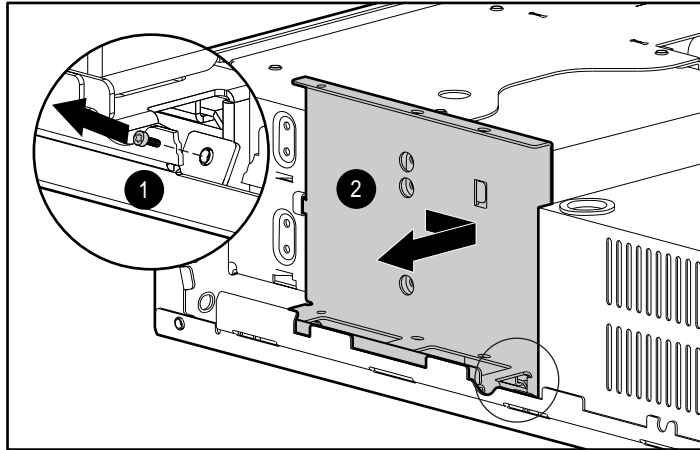
Figure 9-3. Removing the hard drive bracket (Bay 5)

6. Place the hard drive in the bracket.

7. Secure the hard drive with the four screws provided.
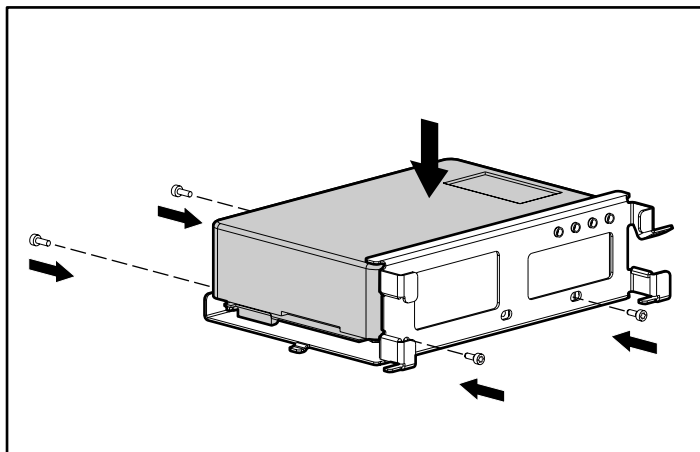
Figure 9-4. Installing the 9.1-GB hard drive in the hard drive bracket

8. Install the hard drive/bracket by sliding it towards the front of the workstation ❶. Make sure to engage the tab on the back of the bracket with the slot provided on the side of the drive cage.

9. Secure the hard drive/bracket assembly to the drive cage with the screw provided ❷.
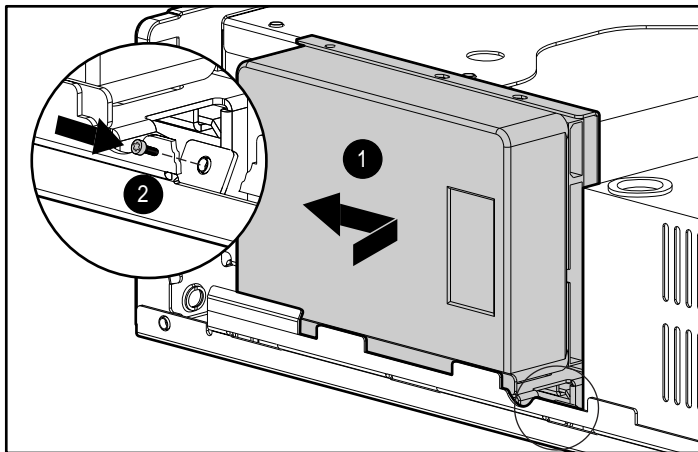
Figure 9-5. Installing the hard drive/bracket assembly

10. Connect the drive power and signal cables to the back of the drive.

⚠ **CAUTION:** Do not route cables near the intake of the power supply. Cables routed in this manner may block airflow to the power supply causing it to overheat.
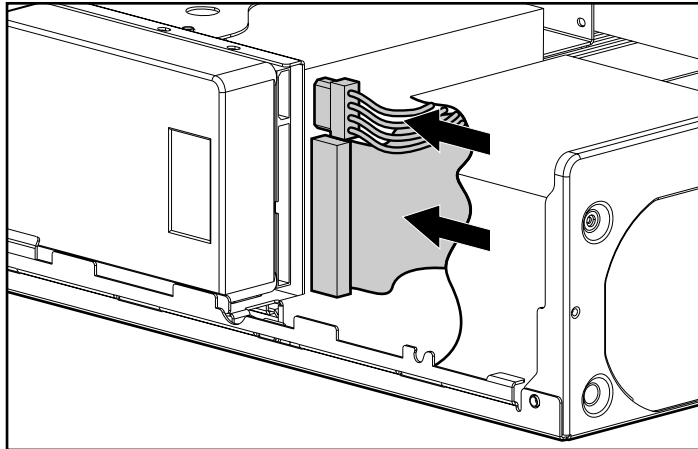
Figure 9-6. Connecting the signal and power cables to the 9.1-GB hard drive

11. Replace the workstation cover.

12. Reconfigure the workstation. See Chapter 2 for instructions.

Installing an Optional CD-ROM, PD-CD, or Tape Drive

To install an optional CD-ROM, PD-CD, or tape drive:

NOTE: These procedures can also be used for installing a SCSI device. Prior to installing a SCSI device, please read "Installing Optional SCSI Devices" later in this chapter.

1. Turn off the workstation.

2. Disconnect the power cord from the electrical outlet.

3. Remove the following components:

   ❑ workstation cover

   ❑ front bezel

   ❑ EMI shield

4. Install the guide screw into the first screw hole on the left-hand side of the drive.

   NOTE: Some options use M3 metric thread hardware. Extra guide screws are provided on the front of the chassis, behind the front bezel. The Compaq-supplied metric screws are black.

5. Insert the drive in the desired bay making sure the guide screw lines up with the guide slot in the drive cage.

6. Secure the drive to the side of the drive cage with the two screws provided. (If a hard drive is installed in Bay 5, you must remove the hard drive/bracket assembly in order to access the two screw holes.)
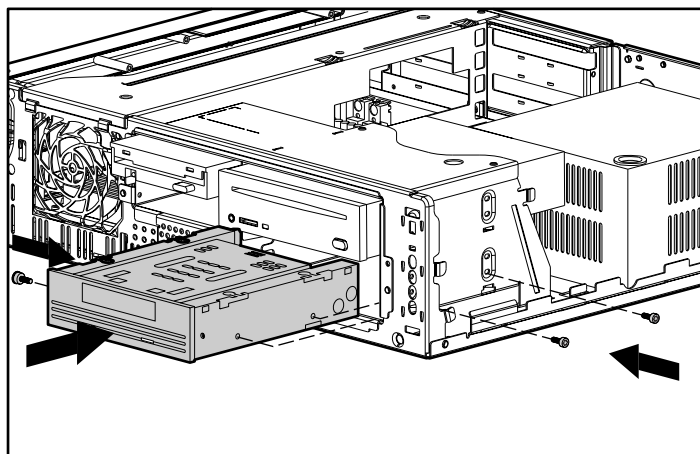
Figure 9-7.   Installing an optional 5.25-inch drive

7. Connect the drive power and signal cables.

   NOTE: You may need to extend the drive cage slightly from the chassis in order to connect the cables.

   ⚠   **CAUTION:**   Do not route cables near the intake of the power supply. Cables routed in this manner may block airflow to the power supply causing it to overheat.
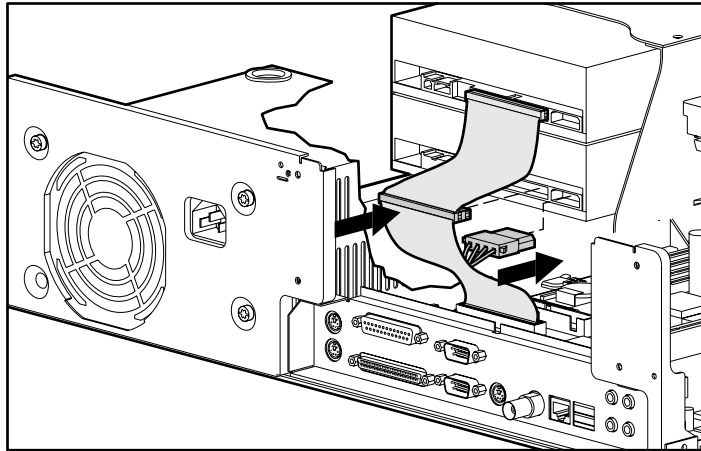
Figure 9-8.   Connecting the signal and power cables

8. If you are installing a CD-ROM or PD-CD drive connect the audio cable. Be sure to connect the other end of the audio cable to the system board.
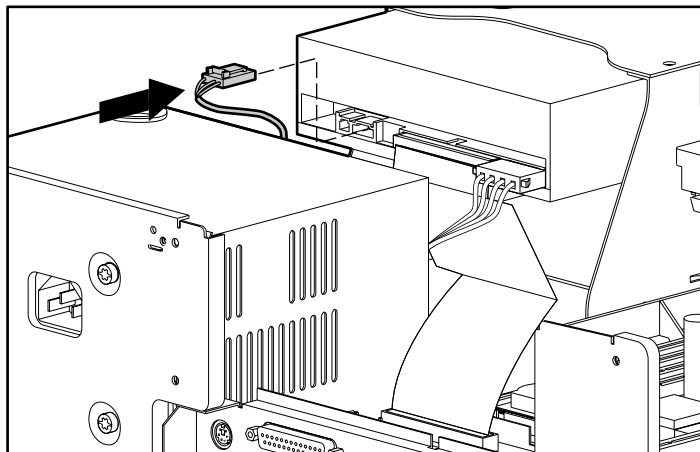
Figure 9-9.   Connecting the audio cable

9. Remove the blank drive bezel from the inside of the front bezel.

10. Replace the front bezel and workstation cover.

11. Reconfigure the workstation. See Chapter 2 for instructions.

Installing a 3.5-Inch Drive in a 5.25-Inch Drive Bay

To install a 3.5-inch drive into a 5.25-inch drive bay:

1. Turn off the workstation.

2. Disconnect the power cord from the electrical outlet.

3. Remove the following components:

   ❏   workstation cover

   ❏   front bezel

   ❏   EMI shield

4. Place the 3.5-inch drive in the 5.25-inch bracket and secure the drive to the bracket with the screws provided.
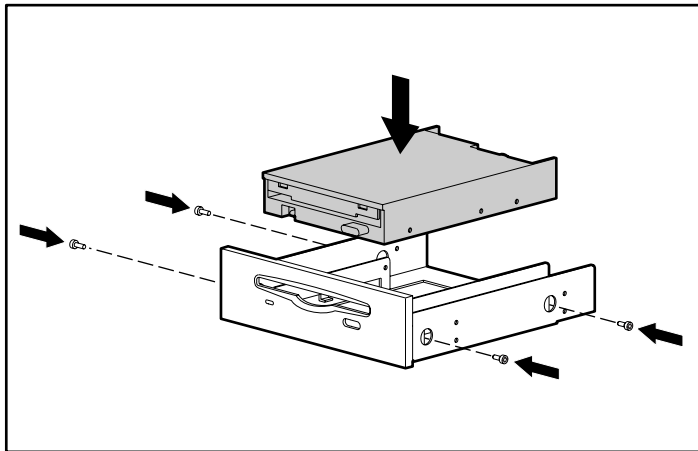
Figure 9-10. Attaching a 3.5-inch drive to the 5.25-inch bracket

5. Install the guide screw into the first screw hole on the left-hand side of the bracket.

   NOTE: Some options use M3 metric thread hardware. Extra guide screws are provided on the front of the chassis, behind the front bezel. The Compaq-supplied metric screws are black.

6. Insert the 3.5-inch drive/5.25-inch bracket assembly into the desired bay making sure the guide screw lines up with the guide slot in the drive cage.

7. Secure the bracket assembly to the side of the drive cage with the two screws provided. (If a hard drive is installed in Bay 5, you must remove the hard drive/bracket assembly in order to access the two screw holes.)
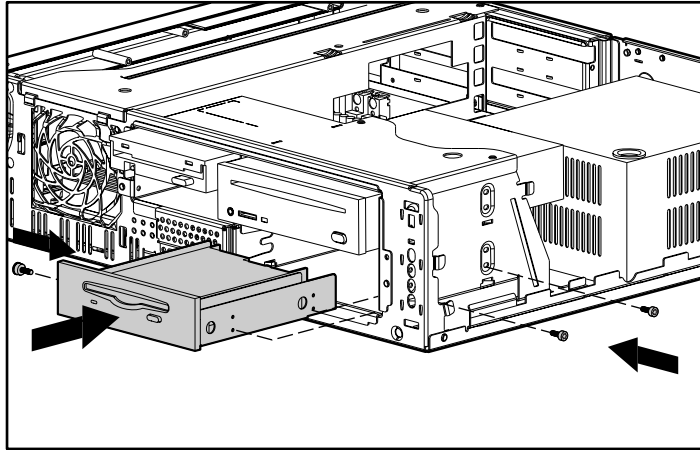
Figure 9-11.   Installing a bracket and 3.5-inch drive

8. Connect the drive power and signal cables.

   NOTE: You may need to extend the drive cage slightly from the chassis in order to connect the cables.

   ⚠ **CAUTION:** Do not route cables near the intake of the power supply. Cables routed in this manner may block airflow to the power supply causing it to overheat.
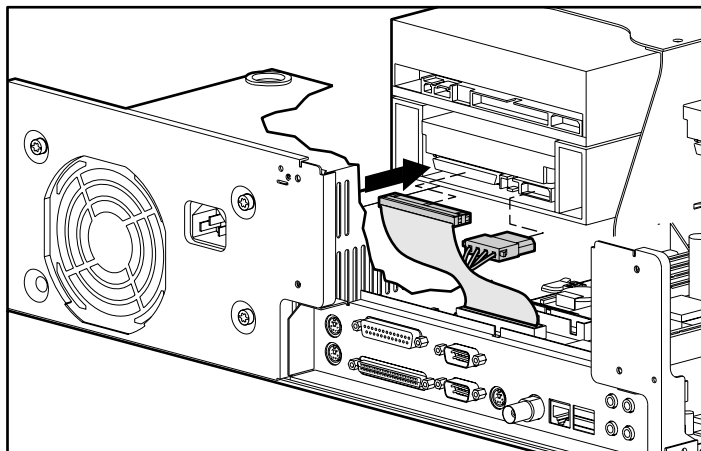
Figure 9-12.   Connecting the drive cables

9. Remove the blank drive bezel from the inside of the front bezel, if necessary.

10. Reassemble the workstation.

11. Reconfigure the workstation. See Chapter 2 for instructions.

Installing Optional SCSI Devices

Aside from the internal SCSI hard drive preinstalled on your workstation, you can install additional high-performance SCSI devices using the external SCSI connector located on the rear panel of the workstation.

Important Guidelines for Installing Optional SCSI Devices

If you are installing additional SCSI devices, you **MUST** adhere to the following guidelines:

- To preserve data integrity, do not install more than seven SCSI devices per SCSI controller.

- All SCSI hard drives on the same SCSI bus must be either internal or external, but never both. A configuration with both internal and external SCSI hard drives requires more than one single-channel SCSI controller. A multi-channel controller, such as the Compaq SMART-2DH Array Controller supports both internal and external SCSI hard drives on separate SCSI buses. (A single-channel SCSI controller can, however, accommodate both internal and external SCSI tape drives and CD-ROM drives.)

- The integrated Wide-Ultra SCSI controller requires that a unique SCSI ID (0-7) be set for each SCSI device installed. The controller identifies signals to and from a SCSI device by its SCSI ID number rather than its location. Moving a SCSI device from one position to another on the SCSI chain does not affect the communication between the controller and the SCSI device. The reserved and available SCSI ID numbers for SCSI devices are as follows:

  - SCSI ID 0 is reserved for the primary hard drive.

  - SCSI ID 7 is reserved for the controller.

  - 1 through 6 are available.

- Every SCSI chain or circuit must be terminated (closed) at both ends. Termination can be accomplished by using the terminating feature on the device or by using a terminated cable.

■ SCSI devices may not have terminating jumpers on the device. Termination on these devices must be achieved with terminated cable.

■ Turn on an external SCSI device before turning on power to the workstation. This enables the system board controller to recognize the external SCSI device and automatically reset. When an external SCSI device is connected to the external SCSI connector on the rear panel of the workstation, that device becomes the end of the SCSI chain and must be terminated.

> **CAUTION:**   Do not route cables near the intake to the power supply. Cables routed in this manner may block airflow to the power supply causing it to overheat.

Using the SCSI Cable

The following SCSI cable is included with your workstation:
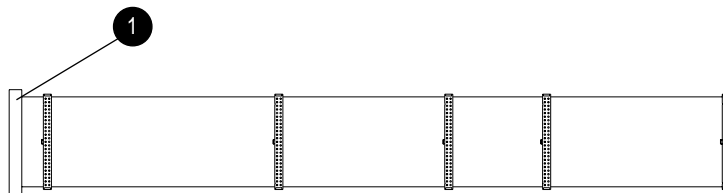
Figure 9-13.   SCSI cable

The SCSI cable illustrated above supports up to 4 SCSI devices and comes with a terminator ❶ on the end.

> **NOTE**:   If you are installing a narrow SCSI device, you will need to attach a 68- to 50-pin external SCSI adapter to the optional SCSI device.

For additional information about installing optional SCSI devices, refer to the documentation included with the device or contact your Compaq authorized dealer, reseller, or service provider.

Installing a SCSI Device

Before you install a SCSI device:

- Verify the SCSI ID of the drive and, if necessary, set the SCSI ID to a new number. Be sure that each SCSI device on the SCSI chain has a unique SCSI ID number. See the section "Important Guidelines for Installing Optional SCSI Devices" earlier in this chapter or refer to the documentation included with the device.

- Determine if the device ought to have termination enabled or disabled. Set the termination if necessary. See the section "Using the SCSI Cable" earlier in this chapter or refer to the documentation included with the device.

To install a SCSI device, please follow the procedures for "Installing an Optional CD-ROM, PD-CD, or Tape Drive" earlier in this chapter.

Chapter 10
Expansion Boards

This chapter provides instructions for installing PCI and ISA expansion boards, including graphics controllers.

For more complete information on graphics controllers, see Chapter 11.

For information on preparing the workstation for upgrades, see Chapter 7.

Installing an Expansion Board

Your workstation contains six expansion slots, five of which are available at any one time. The following figure identifies the physical locations of slots 1-6. See the corresponding table for component names.
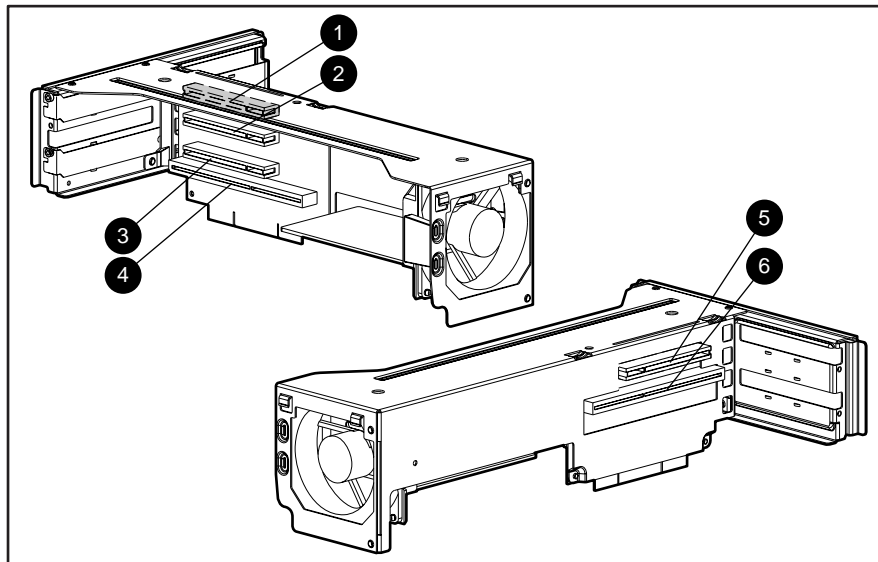
Figure 10-1.   Identifying the expansion slots

Table 10-1
PCI/ISA Slots

Ref.		Component
1		PCI (Peripheral Component Interconnect) expansion slot
2		PCI (Peripheral Component Interconnect) expansion slot
3	*	PCI (Peripheral Component Interconnect) expansion slot
4	*	ISA (Industry Standard Architecture) expansion slot
5		PCI (Peripheral Component Interconnect) expansion slot
6		ISA (Industry Standard Architecture) expansion slot

*Slots 3 and 4 are shared. They cannot be used simultaneously.

Removing an Expansion Slot Cover

To remove an expansion slot cover:

1. Remove the expansion board cage from the workstation chassis.

2. Locate the correct vacant slot in the expansion board cage.

3. Remove the screw at the side of the expansion slot, then remove the expansion slot cover from the slot.
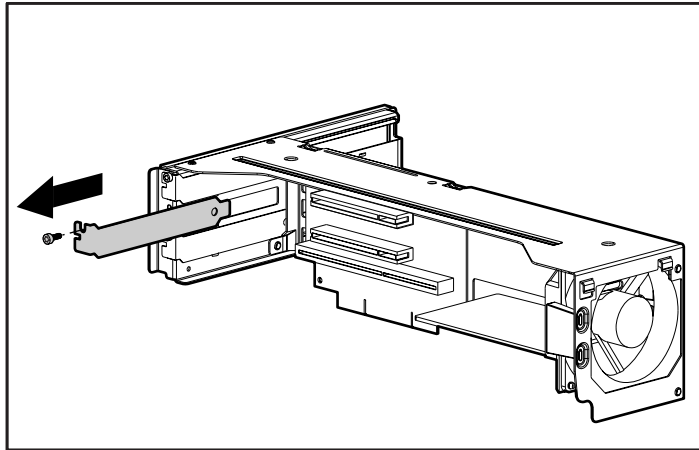
Figure 10-2.   Removing the screw and expansion slot cover

Installing an Expansion Slot Cover

To install an expansion slot cover:

1. Slide the expansion slot cover into place over the slot opening.

2. Install the screw at the side of the expansion slot to secure the slot cover.

Installing a PCI or ISA Board

NOTE: These procedures can also be used for installing a graphics controller. For more information on graphics controllers, see Chapter 11.

To install a PCI or ISA expansion board:

1. Remove the expansion board cage from the workstation chassis.

2. Remove the expansion slot cover.

3. Slide the expansion board into the expansion slot and press it firmly into place.

   NOTE: When installing an expansion board, make sure you press firmly on the board so that the whole connector seats properly in the expansion board slot. If you are installing a full length expansion board, be sure to engage the card guide located behind the fan bracket (not shown).
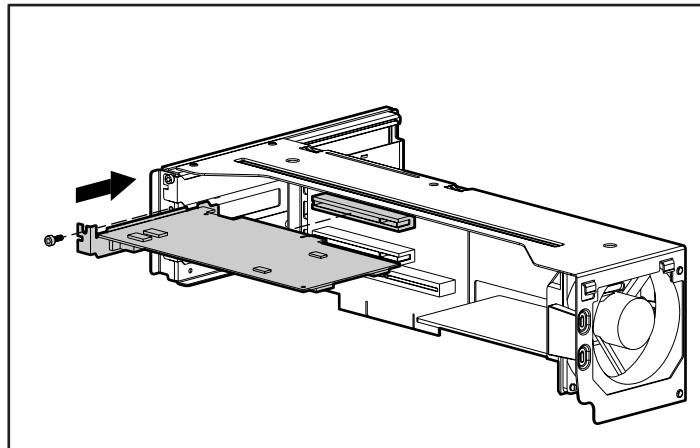
Figure 10-3.   Installing an expansion board

4. Replace the screw at the side of the expansion slot.

> **IMPORTANT:**   If you have just installed a full height ISA board, you **must** remove the speaker and baffle assembly *prior* to replacing the expansion board cage. For instructions on removing the assembly, see "Removing the Speaker and Baffle" in Chapter 7.

> **IMPORTANT:**   Before replacing the expansion board cage, read "Important Guidelines for Expansion Board Cage Replacement" in Chapter 7.

5. Replace the expansion board cage.

6. If necessary, replace the speaker and baffle assembly and reconnect the speaker cable to the system board.

7. Replace the workstation cover.

8. Connect external cables to the installed board, if needed.

9. Reconfigure the workstation. Refer to Chapter 2 for instructions.

10. Test the workstation (optional) using the Computer Checkup (TEST) utility. Refer to Chapter 2 for instructions.

Removing a PCI or ISA Board

To remove a PCI or ISA board:

> **IMPORTANT:** If you are removing a full height ISA board, you **must** remove the speaker and baffle assembly *prior* to removing the expansion board cage. For instructions on removing the assembly, see "Removing the Speaker and Baffle" in Chapter 7.

NOTE: These procedures can also be used for removing a graphics controller.

1. Remove the expansion board cage.

2. Disconnect any cables attached to the expansion board.

3. Remove the screw at the side of the expansion slot.

4. Hold the board at each end and carefully rock it back and forth until the connectors pull free from the slot. Be sure not to scrape the board against other components.
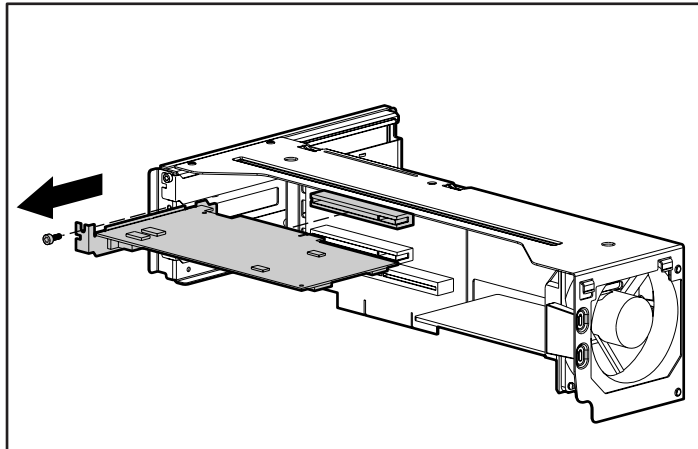
Figure 10-4.   Removing an expansion board

5. Store the board in antistatic packaging.

6. Install an expansion slot cover over the open slot.

7. If necessary, replace the speaker and baffle assembly and reconnect the speaker cable to the system board.

8. Reassemble the workstation.

> **IMPORTANT:** Before replacing the expansion board cage, read "Important Guidelines for Expansion Board Cage Replacement" in Chapter 7.

Chapter 11
Graphics Controllers

Overview

The purpose of a graphics controller is to generate and send the graphics signal to the monitor. The quality of the picture you see depends on the resolution of your monitor and the number of colors that the graphics controller can display. High-resolution graphics with many colors requires that the graphics controller have its own memory.

The Compaq Professional Workstation 5100 comes standard with *one* of the following graphics controllers:

■ MGA Millennium II

■ MVP Workstation

■ GLoria Synergy

■ GLoria-XL 3D

■ Fire GL 4000

For more complete information on each graphics controller, refer to the individual installation guides on the SmartStart for Workstation CD. The guides are located at X:\DOCS\GRAPHICS\, where *X* is your CD-ROM drive designation.

Multi-Monitor Support

Depending on the graphics controller installed, your workstation can support multiple monitors. The following table illustrates the configurations required for multiple monitor support.

Table 11-1
Graphics Controllers
Configurations for Multi-Monitor Support

Graphics Controller	Hardware Configurations
MGA Millennium II	Supports one monitor. For multiple monitor support, install additional controllers.
MVP Workstation	Supports up to 2 monitors. For additional monitor support, up to a maximum of 4, install the optional daughter card. A second MVP Workstation graphics controller and daughter card can be installed to support up to a maximum of 8 monitors.
MVP Workstation + Daughter Card	Supports up to 4 monitors. For additional monitor support, up to a maximum of 8, install a second optional MVP Workstation graphics controller and daughter card.
GLoria Synergy	Supports one monitor. For multiple monitor support, install additional controllers.
GLoria-XL 3D	Supports one monitor. For multiple monitor support, install additional controllers.

NOTE: The Fire GL 4000 graphics controller does not support multiple monitors at this time.

For more information on each graphics controller, see the documentation included in the option kit or on the SmartStart for Workstations CD.

Workstation models that ship with an MVP Workstation graphics controller include a four-port splitter cable for connecting multiple monitors and the Mediator utility which is preinstalled on your workstation or installed automatically during the SmartStart process. Mediator allows you to use multiple monitors and control the position of dialog boxes and application windows. For information on using Mediator, refer to the online installation guide for the MVP Workstation graphics controller. The online guide is located on the SmartStart for Workstations CD at X:\DOCS\GRAPHICS\STB.PDF, where *X* is your CD-ROM drive designation.

MGA Millennium II Graphics Controller

The MGA Millennium II graphics controller offers the following features:

■   Standard 4 MB of WRAM, upgradable to 8- or 16-MB.

■   Single monitor support, expandable to multiple monitor support by installing additional controllers

■   Single-buffer and double-buffer (16-Bit and 32-Bit Z Buffer) resolution modes

Upgrading Memory

To install a memory upgrade module on the MGA Millennium II graphics controller, refer to the documentation included in the memory upgrade kit.

Installing an Additional Controller

The MGA Millennium II graphics controller installed on your workstation provides single-monitor support. To upgrade your workstation to a multiple-monitor system, you must install an additional controller. Additional MGA Millennium II graphics controllers are available through your local Compaq distributor. Refer to the documentation included in the option kit for installation procedures.

Resolutions and Color Support

Table 11-2
Maximum Color Support
MGA Millennium II
Double Buffer Mode, 16-Bit Z Buffer

Resolutions	4 MB	8 MB	16 MB
1800 x 1440	-	-	65,536
1920 x 1200	-	-	65,536
1920 x 1080	-	256	65,536
1920 x 1034 I*	-	256	65,536
1600 x 1200	-	256	65,536
1600 x 1024	-	256	16,777,216
1280 x 1024	-	65,536	16,777,216
1152 x 864	256	65,536	16,777,216
1024 x 768	256	16,777,216	16,777,216
800 x 600	65,536	16,777,216	16,777,216
640 x 480	16,777,216	16,777,216	16,777,216

I* = interlaced screen mode

Table 11-3
Maximum Color Support
MGA Millennium II
Double Buffer Mode, 32-Bit Z Buffer

Resolutions	4 MB	8 MB	16 MB
1800 x 1440	-	-	256
1920 x 1200	-	-	256
1920 x 1080	-	-	65,536
1920 x 1034 I*	-	-	65,536
1600 x 1200	-	-	65,536
1600 x 1024	-	-	65,536
1280 x 1024	-	256	16,777,216
1152 x 864	-	65,536	16,777,216
1024 x 768	-	65,536	16,777,216
800 x 600	65,536	16,777,216	16,777,216
640 x 480	16,777,216	16,777,216	16,777,216

I* = interlaced screen mode

Table 11-4
Maximum Color Support
MGA Millennium II
Single Buffer Mode

Resolutions	4 MB	8 MB	16 MB
1800 x 1440	256	65,536	65,536
1920 x 1200	256	16,777,216	16,777,216
1920 x 1080	65,536	16,777,216	16,777,216
1920 x 1034 I*	65,536	16,777,216	16,777,216
1600 x 1200	65,536	16,777,216	16,777,216
1600 x 1024	65,536	16,777,216	16,777,216
1280 x 1024	16,777,216	16,777,216	16,777,216
1152 x 864	16,777,216	16,777,216	16,777,216
1024 x 768	16,777,216	16,777,216	16,777,216
800 x 600	16,777,216	16,777,216	16,777,216
640 x 480	16,777,216	16,777,216	16,777,216

I* = interlaced screen mode

MVP Workstation Graphics Controller

The MVP Workstation graphics controller offers the following features:

■ 64-bit graphics engine

■ Standard 4-MB per port of integrated EDO DRAM

■ Multiple monitor support (up to 2 monitors per controller), expandable
to a maximum of 4 monitors by installing the optional daughter card
controller

■ The Mediator utility allows you to designate the placement of an
application or window on a particular monitor.

Connecting the Four Port Splitter Cable

If your workstation shipped with an MVP Workstation graphics controller, a
four port splitter cable is provided. This cable allows you to connect multiple
monitors to the MVP Workstation graphics controller.

To connect the four port splitter cable:

1. Unpack the cable shipped with your workstation.

2. Locate the MVP Workstation graphics controller 68-pin connector ❶.
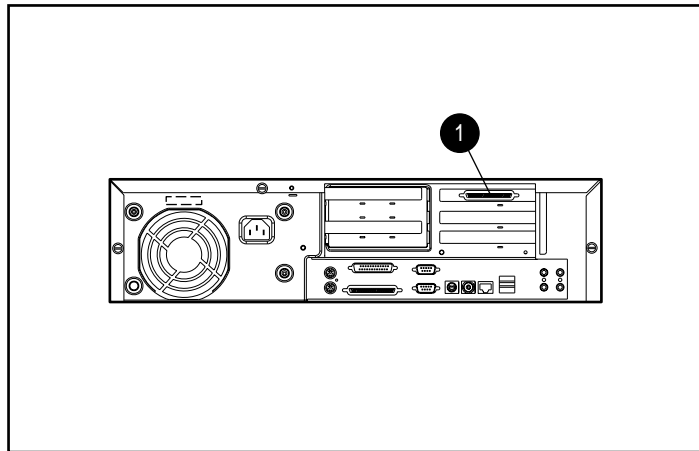
Figure 11-1.　Locating the MVP Workstation graphics controller 68-pin connector

3. Connect the male end of the cable ❶ to the 68-pin connector on the rear of the workstation. Tighten the screws to secure the cable.

4. Plug the 15-pin connectors "A" and "B" into your monitors. (Plug "A" into the monitor you want to designate as monitor 1, then plug "B" into the second monitor.)

   NOTE: If you install the optional daughter card, you can connect "C" and "D" to a third and fourth monitor.
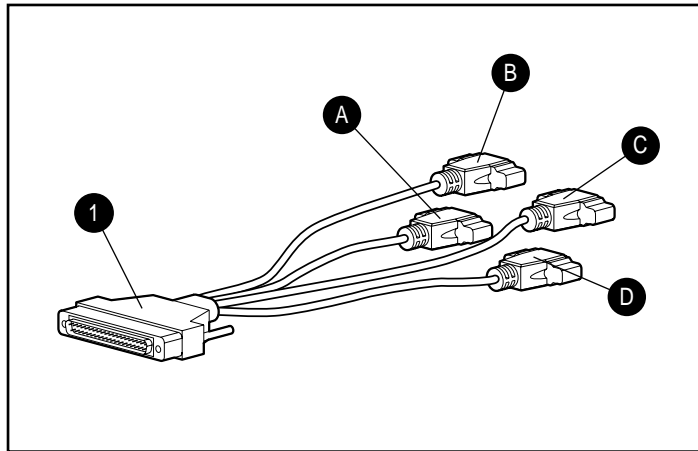
Figure 11-2. Identifying the connectors on the four port splitter cable

5. Plug in all power cords, turn on both monitors, then turn on the workstation. When the system boots, you should have the normal screen on one monitor.

> ⚠ **WARNING:** To reduce the risk of electric shock or damage to the equipment:
> - Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
> - Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

For more information, refer to the *MVP Workstation Graphics Controller Installation Guide* located on the SmartStart for Workstations CD at X:\DOCS\GRAPHICS\STB.PDF**,** where *X* is your CD-ROM drive designation.

Installing the Daughter Card Upgrade or an Additional Graphics Controller

The MVP Workstation graphics controller supports up to 2 monitors. With the daughter card installed, your system supports up to 4 monitors. Some workstation models ship with *both* the MVP Workstation graphics controller and the daughter card installed. For models that ship with the MVP Workstation graphics controller only, the daughter card is available as an optional upgrade.

If your workstation was previously upgraded with a daughter card, you can increase your monitor support further (up to a maximum of 8 monitors) by installing a *second* MVP Workstation graphics controller and daughter card combination. For information on upgrading the MVP Workstation graphics controller refer to the documentation included with the upgrade kit.

Resolutions and Color Support

Table 11-5
Supported Resolutions Per Monitor
MVP Workstation Graphics Controller

Resolutions	Colors		
640 x 480	256	65,536	16,777,216
800 x 600	256	65,536	16,777,216
1024 x 768	256	65,536	16,777,216
1152 x 864	256	-	-
1280 x 1024	256	65,536	-
1600 x 1200	256	-	-

GLoria Synergy Graphics Controller

The GLoria Synergy graphics controller offers the following key features:

■ 8 MB SGRAM

■ High resolution 2D and 3D graphics

■ Single monitor support, expandable to multiple monitor support by installing additional controllers

■ Single-buffer and double-buffer (16-bit Z buffer) resolution modes

Installing an Additional Controller

The GLoria Synergy graphics controller installed on your workstation provides single-monitor support. To upgrade your workstation to a multiple-monitor system, you must install an additional controller. Additional GLoria Synergy graphics controllers are available through your local Compaq distributor. Refer to the documentation included in the option kit for installation procedures.

Resolutions and Color Support

Table 11-6
Maximum Color Support
GLoria Synergy

Resolutions	Maximum Colors
1920 x 1200	32,768
1920 x 1080	32,768
1600 x 1280	32,768
1600 x 1200	32,768
1600 x 1000	16,777,216
1536 x 1152	32,768
1280 x 1024	16,777,216
1152 x 864	16,777,216
1024 x 768	16,777,216
800 x 600	16,777,216
640 x 480	16,777,216

GLoria-XL 3D Graphics Controller

The GLoria-XL 3D graphics controller offers the following features:

■   Standard 16 MB of VRAM for display memory

■   Standard 24 MB of DRAM for Z-buffer and texture buffer, upgradable
     to 40 MB

Upgrading Memory

To install a memory upgrade module on the GLoria-XL 3D graphics controller,
refer to the documentation included with the memory upgrade kit.

Installing an Additional Graphics Controller

The GLoria-XL 3D graphics controller installed on your workstation provides
single-monitor support. To upgrade your workstation to a multiple-monitor
system, you must install an additional controller. Additional GLoria-XL 3D
graphics controllers are available through your local Compaq distributor. Refer
to the documentation included in the option kit for installation procedures.

Resolution and Color Support

Table 11-7
Supported Resolutions
GLoria-XL 3D Graphics Controller
Maximum Color Support

Resolution	Single Buffer	Double Buffer
1920 x 1200	32,768	32,768
1920 x 1080	16,777,216	16,777,216
1600 x 1280	16,777,216	16,777,216
1600 x 1200	16,777,216	16,777,216
1280 x 1024	16,777,216	16,777,216
1152 x 864	16,777,216	16,777,216
1024 x 768	16,777,216	16,777,216
800 x 600	16,777,216	16,777,216

Fire GL 4000 Graphics Controller

The Fire GL 4000 graphics controller offers the following key features:

■ RealImage Graphics Technology from Evans & Sutherland

■ CIRRUS Logic 5446 VGA controller with 1 MB DRAM

■ Connector and support for stereographics display

■ Standard 15-MB 3D-RAM (frame buffer and Z-buffer)

■ Standard 16-MB CDRAM texture buffer memory

Resolutions and Color Support

Table 11-8
Maximum Color Support
Fire GL 4000 Graphics Controller
Single Buffer Mode

Resolution	Color	Refresh Rate (Hz)
1280 x 1024 *	16,777,216	85
1024 x 768	16,777,216	100
800 x 600	16,777,216	120
640 x 480	16,777,216	120

* Stereographic CrystalEyes applications must be set for 1280 x 1024 at 60 Hz.

> **NOTE**:   Due to its frame buffer and drawing engine architecture, the Fire GL 4000 graphics controller supports only TrueColor (16.7 M simultaneous colors) 32-bit RGBA video output modes.

Chapter 12
Processors

This chapter explains how to install an additional processor and how to upgrade an existing processor.

For information on preparing the workstation for upgrades, see Chapter 7.

Installing an Additional Processor

If your workstation shipped with a single processor installed, you can upgrade to a multi-processor system by installing a second Intel Pentium II processor of the same speed and type in the secondary processor slot.

> ⚠ **WARNING:**   To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

> **CAUTION:**   Installing the processor incorrectly may cause damage to the system board. Compaq recommends that you have a Compaq authorized reseller or service provider install the processor. If you plan to install it yourself, read all the instructions carefully before you begin.

To install a second Pentium II processor:

1. Turn off the workstation.

2. Disconnect the power cord from the electrical outlet.

3. Remove the following components:

    ❏   workstation cover

    ❏   expansion board cage

4. Press inward on the levers securing the terminator board.

---

5. Remove the terminator board by pulling it parallel to the system board.

   NOTE: Store the terminator board for future use. If you should decide to revert back to a single processor system or temporarily remove the second processor, you would need to reinstall the terminator board.
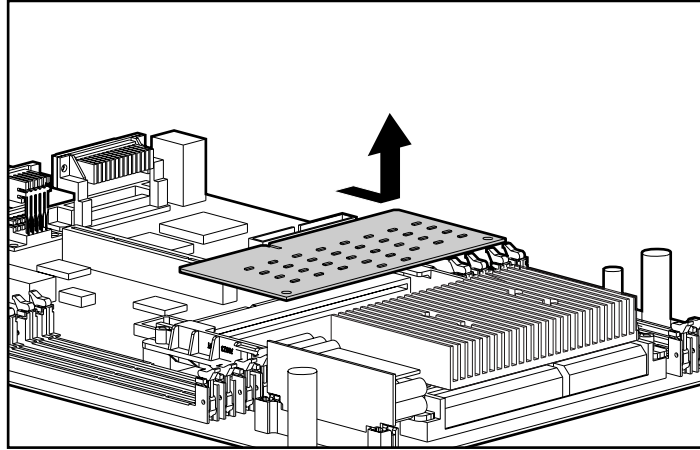
Figure 12-1.   Removing the terminator board

6. Install the Processor Power Module into the socket.
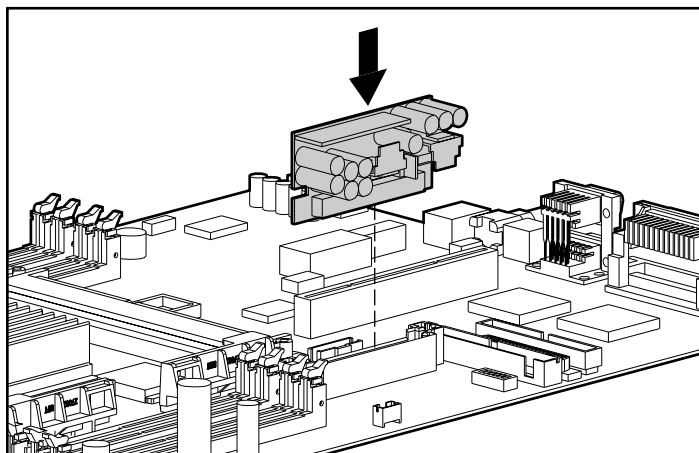
Figure 12-2.   Installing the Processor Power Module

7. Install the Pentium II processor/heatsink assembly keeping it parallel to the system board.

△ **CAUTION:** When installing the Pentium II processor, DO NOT touch the connector pins on the processor. **Bent connector pins could result in damage to the system board.**
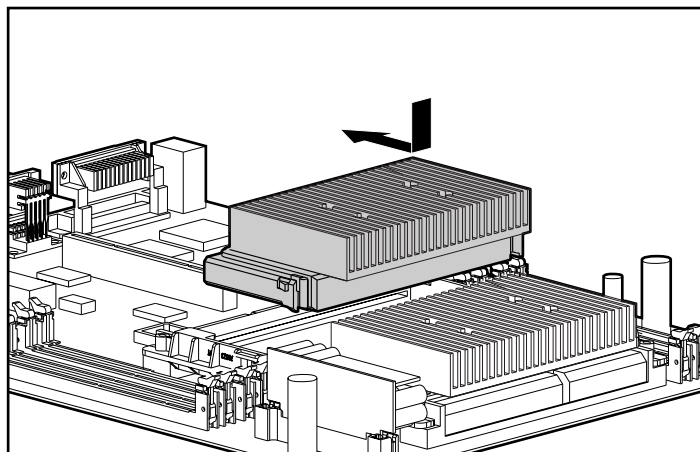
Figure 12-3. Installing a second processor/heatsink assembly

8. Place the heatsink bridge (included in the processor upgrade kit) on top of, and between, the primary and secondary processors.
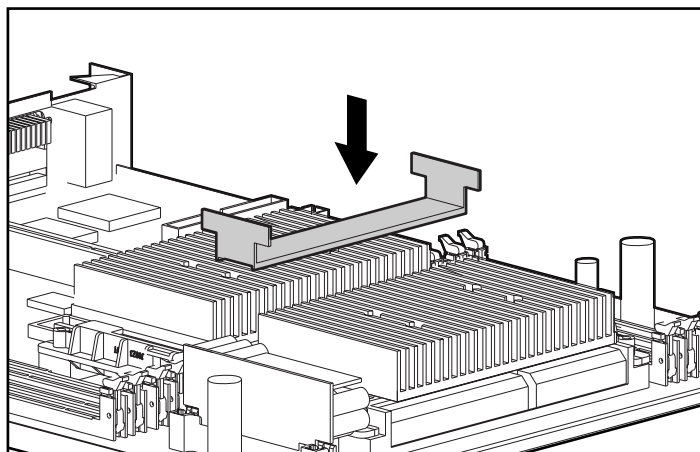
Figure 12-4.   Attaching the heatsink bridge

NOTE: Hook ends over the outside of the heatsink fins.

9. Reassemble the workstation.

> **IMPORTANT:**   Prior to replacing the expansion board cage, read "Important Guidelines for Expansion Board Cage Replacement" earlier in this chapter.

10. Test the system (optional) using the Computer Checkup (TEST) utility. See Chapter 2 for instructions.

> **IMPORTANT:**   If you are installing a second processor, you must install a new Multiprocessing HAL. For information on upgrading the HAL from a one-processor system to a two-processor system, see the instructions provided with the processor upgrade kit.

NOTE: For more information on installing additional processors, refer to the processor upgrade kit.

Upgrading the Processor

To upgrade the processor, follow the installation procedures included with the processor upgrade kit.

Chapter 13
Troubleshooting

This chapter provides information on how to identify and correct some common disk, display, memory, network, SCSI, and software problems. It also identifies and explains some common messages you may receive on the screen.

Consult Appendix D, "POST Error Messages," for an explanation of specific messages that may display during the Power-On Self-Test (POST) at startup.

Checklist for Minor Problems

If you encounter some minor problem with your workstation, monitor, or software, refer to the following list of general suggestions before taking further action:

■   Check that the workstation and monitor are plugged into a working electrical outlet.

■   Check to see that the workstation is turned on and the green power light is on.

■   Check to see that the monitor is turned on and the green monitor light is on.

■   Turn up the brightness and contrast controls of the monitor if the monitor is dim.

■   Press and hold any key. If the system beeps, then your keyboard is operating correctly.

■   Check all cable connections for loose connections or incorrect connections.

■   Make sure you ran the Setup utility after installing an expansion board, ISA board, or other option (memory, disk drives).

■   Check that all switch settings have been set as instructed by the Setup utility.

■   Be sure that all the needed device drivers have been installed (for example, if you are using a mouse, you need a mouse device driver).

■   Ensure that all printer drivers have been installed for each application.

■   Take out all diskettes from the diskette drives before you turn on your system.

■   If you have corrupted your Windows NT configuration, reboot the workstation. When the startup program prompts you to press the spacebar to invoke the last known good menu, press the spacebar. Windows NT remembers your last working configuration and runs it.

Troubleshooting Common Problems

Although your workstation is configured for your particular hardware and
software, problems you encounter while working may not be unique.
Eliminating the typical problems described in this section may save you time
and money. If you do have a problem with your workstation, consider the
problems and possible solutions outlined in the following series of tables. You
may discover something you can resolve easily for yourself. If the condition
persists contact your Compaq authorized reseller or service provider. Refer to
"Getting Help" in the front of this guide for a list of Compaq worldwide
technical support telephone numbers.

Minor Problems

**Table 13-1
Solving Minor Problems**

Problem	Possible Cause	Possible Solution
Workstation will not turn on.	Workstation is not connected to an external power source.	Connect to an external power source.
	Cables to the external power source are unplugged.	Ensure that cables connecting the workstation and the external source are plugged in properly.
	A defective PCI or ISA card has been installed.	Remove any adapter card that was just installed.
	Boards or cages not properly installed	Ensure boards or cages are properly seated in unit.

continued

Minor Problems *continued*

Problem	Possible Cause	Possible Solution
Workstation doesn't automatically display the date and time	RTC (real-time clock) battery may need to be replaced. Battery life is approximately 5 years.	Replace the RTC battery. Refer to Appendix E, "Installing a New Battery," for installation instructions, or contact your Compaq authorized reseller or service provider for RTC battery replacement.
Workstation does not beep during the power-on self-test (POST)	Speaker cable is not properly attached.	Ensure that speaker cable is connected.
	Speaker volume is turned down.	Press volume up button. In Windows NT, select Volume Control under Accessories and adjust
	Headphones plugged in	Unplug headphones
System will not boot.	Memory modules may not be installed properly.	Make sure DIMM pairs are installed in alternating slots, not adjacent slots.
	Boards or cages not properly installed	Ensure boards or cages are properly seated in the unit.

Minor Problems *continued*

Problem	Possible Cause	Possible Solution
Workstation powered off automatically.	The unit temperature was exceeded. The fan may be blocked.	1. Unit is in an exceedingly hot environment. Let it cool down.
		2. Make sure internal cables are routed in front of the intake of the power supply.
		3. Contact your Compaq authorized reseller or service provider.

Diskette Drive Problems

Table 13-2
Solving Diskette Drive Problems

	Possible Cause	Possible Solution
Diskette drive light stays on.	Diskette is damaged.	Run CHKDSK on the diskette.
	Diskette is incorrectly inserted.	Remove diskette and reinsert.
	Drive button is not pushed in.	Push in drive button.
	Software program is damaged.	Check the program diskettes or reinstall software from original media.
	Drive cable is not properly connected.	Reconnect drive cable.
Diskette drive cannot write to a diskette.	Diskette is not formatted.	Format the diskette.
	Diskette is write-protected.	Use another diskette or remove the write protection.
	Writing to the wrong drive.	Check the drive letter in your path statement.
	Not enough space is left on the diskette.	Use another diskette.
	Diskette write control is enabled.	Check your security feature settings by running the Setup utility.

Solving Diskette Drive Problems *continued*

Problem	Possible Cause	Possible Solution
A problem has occurred with a disk transaction	The directory structure is bad, or there is a problem with a file.	Run CHKDSK to check for fragmentation.
Diskette drive cannot read a diskette	Diskette is not formatted.	Format the diskette.
	You are using the wrong diskette type for the drive type.	Check the type of drive you are using and use the correct diskette type.
Drive not found	Cable is loose.	Check connections.
Nonsystem disk message	The system is trying to start from a diskette that is not bootable.	Remove the diskette from the drive.

Display Problems

Table 13-3
Solving Display Problems

Problem	Possible Cause	Possible Solution
Blank screen	Monitor is not turned on and the monitor light is not on.	Turn on the monitor and check that the monitor light is on.
	The cable connections are not correct.	Check the cable connection from the monitor to the workstation and to the electrical outlet.
	The QuickBlank feature has been enabled through Computer Setup.	Run Computer Setup and disable the QuickBlank feature.
	The energy saver feature has been enabled.	Press any key or type your password and wait a few moments for the screen to activate.
	The RGB (Red, Green, Blue) input switch on the back of the monitor is incorrectly set.	Set the monitor's RGB input switch to 75 ohms and, if there is a sync switch, set it to External.
	You are using a fixed-sync monitor and it won't sync at the resolution chosen.	Be sure that the monitor can support the selected resolution and refresh rate.

continued

Solving Display Problems *continued*

Problem	Possible Cause	Possible Solution
Monitor does not function properly when used with energy saver features	Monitor without energy saver capabilities is being used with energy saver features enabled.	Disable monitor energy saver feature.
Blurry display or requested resolution cannot be set.	If the graphics controller was upgraded, the correct display drivers may not be loaded.	Install the display drivers included in the upgrade kit.
The picture is broken up; it rolls, jitters, or blinks.	Monitor cable may be loose.	Be sure the monitor cable is securely connected to the workstation.
	In a 2-monitor system or if another monitor is in close proximity, the monitors may interfere with each other's magnetic field.	Move the monitors farther apart.
Monitor overheats	There is not enough ventilation space for proper airflow.	Leave at least 3 inches (7.6 cm) of ventilation space. Also, be sure there is nothing on top of the monitor to obstruct airflow.

Solving Display Problems *continued*

Problem	Possible Cause	Possible Solution
Video colors are wrong	This indicates that either the cabling or monitor impedance is incorrect.	1. Ensure that the Red, Green, and Blue BNC cables are connected to the corresponding monitor connectors.
		2. Be sure your monitor's RGB inputs are set to 75 ohms.

Audio Problems

**Table 13-4
Solving Audio Problems**

Problem	Possible Cause	Possible Solution
Sound does not come out of the speaker	Software volume control is turned down in Microsoft Sound System Control Panel.	In Windows NT, select Volume Control under Accessories and adjust volume.
	Headphones are plugged in.	Unplug headphone jack.
	Speaker cable is loose.	Ensure that the speaker cable is properly connected.
Sound does not come through the headphones	Headphones are not plugged in correctly or volume control is turned down.	1. Check the headphone cable connection. 2. Adjust the headphone volume control.

Printer Problems

**Table 13-5
Solving Printer Problems**

Problem	Possible Cause	Possible Solution
Printer will not print.	Printer is not turned on and online.	Turn the printer on and make sure it is online.
	The correct printer drivers for your application are not installed.	Install the correct printer drivers for your application.
	If you are on a network, you may not have made the connection to the printer.	Make the proper network connections to the printer.
Printer will not turn on.	The cables may not be connected properly.	Reconnect all cables and check the power cord and electrical outlet.
Printer prints garbled information.	The correct printer drivers for your application are not installed.	Install the correct printer driver for your application.
	The cables may not be connected properly.	Reconnect all cables.
Printer is offline.	The printer may be out of paper.	1. Check the paper tray and refill it if it is empty. 2. Select online.

Hardware Installation Problems

Table 13-6
Solving Hardware Problems

Problem	Possible Cause	Possible Solution
A new device is not recognized as part of the system	Computer Setup or the SCSI software utility has not been run to configure the new device.	Run Computer Setup or the SCSI software utility.
	Cable(s) of new external device are loose or power cables are unplugged.	Ensure that all cables are properly and securely connected and that pins in the cable or connector are not bent down.
	Power switch of new external device is not turned on.	Turn off the workstation, turn on the external device, then turn on the workstation to integrate the device with the system.

Network Problems

Table 13-7
Solving Network Problems

Problem	Possible Cause	Possible Solution
Setup utility does not detect a network controller.	Possible I/O address conflict with another expansion board.	Either remove and reconfigure the conflicting expansion board, or reconfigure the network controller. If the address is changed, ensure that the drive parameters match the new I/O address for the network controller.
Setup utility reports unprogrammed EEPROM.	Possible I/O address conflict with another expansion board.	Either remove and reconfigure the conflicting expansion board, or reconfigure the network controller. If the address is changed, ensure that the drive parameters match the new I/O address for the network controller.
	The network controller is defective.	Contact your Compaq authorized service provider.

continued

Solving Network Problems *continued*

Problem	Possible Cause	Possible Solution
	Network drivers are not loaded.	Boot the workstation without the network drivers, using a system boot diskette, and reconfigure the network controller.
Diagnostics reports a failure.	Possible I/O address conflict with another expansion board.	Factory default is 300h to 30Fh for Ethernet. Either remove and reconfigure the conflicting expansion board, or reconfigure the network controller. If the address is changed, ensure that the drive parameters match the new I/O address for the network controller.
	The cable is not securely connected.	Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device.
	The cable is attached to the incorrect connector.	Ensure that the cable is attached to the correct connector.

continued

Solving Network Problems *continued*

Problem	Possible Cause	Possible Solution
	There is a problem with the cable or a device at the other end of the cable.	Ensure that the cable and device at the other end are operating correctly.
	The network controller is defective.	Contact your Compaq authorized service provider.
	Network controller interrupt overlaps the interrupt of an expansion board.	Run the Setup utility and modify the network controller memory value.
Diagnostics passes, but the workstation does not communicate with the network.	Network drivers are not loaded, or driver parameters do not match current configuration.	Make sure the network drivers are loaded and that the driver parameters match the configuration of the network controller.
	The network controller is not configured for this workstation.	In Windows NT, select the Network icon at the Control Panel.
	Network controller interrupt overlaps the interrupt of an expansion board.	Run the Setup utility and modify the network controller memory value.

continued

Solving Network Problems *continued*

Problem	Possible Cause	Possible Solution
Network controller stopped working when an expansion board was added to the workstation.	Network drivers are not loaded, or driver parameters do not match current configuration.	Make sure the network drivers are loaded and that the driver parameters match the configuration of the network controller.
	The cable is not securely connected.	Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device.
	Network controller interrupt overlaps the interrupt of an expansion board.	Run the Setup utility and modify the network controller memory value.
	The network controller requires drivers.	Verify that the drivers were not accidentally deleted when the drivers for a new expansion board were installed.
	The files containing the network drivers are corrupted.	Reinstall the network drivers using your backup diskettes.

Solving Network Problems *continued*

Problem	Possible Cause	Possible Solution
Network controller stopped working without apparent cause.	The files containing the network drivers are corrupted.	Reinstall the network drivers using your Compaq SmartStart for Workstations CD.
	The cable is not securely connected.	Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device.
	The network controller is defective.	Contact your Compaq authorized service provider.

Memory Problems

Table 13-8
Solving Memory Problems

Problem	Possible Cause	Possible Solution
Out of Memory error	Memory configuration may not be set up correctly.	Run Computer Setup or Windows NT utilities.
	You have run out of memory to run the application.	Check the application documentation to determine the memory configuration requirements.
Memory count during POST is wrong	The memory modules may not be installed correctly.	Check that the memory modules have been installed correctly and run the Setup utility.
Insufficient memory error during operation	You have run out of memory for your application.	Check the memory requirements for the application, or add more memory to the workstation.

CD-ROM Drive Problems

Table 13-9
Solving CD-ROM Drive Problems

Problem	Possible Cause	Possible Solution
System will not boot from CD-ROM drive.	The CD-ROM boot is not enabled through the Setup utility.	Run the Setup utility and set the drive priorities.
Data read from CD-ROM drive is inconsistent or drive cannot read data	Paper or plastic label has been applied to surface of the CD in use.	Remove label and any adhesive residue.
CD-ROM devices are not detected, driver is not loaded.	CD-ROM drive is not connected properly or not properly terminated.	Refer to the documentation included with the CD-ROM.

Appendix A
Regulatory Compliance Notices

Federal Communications Commission Notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (i.e., personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The rating label on the device shows which class (A or B) the equipment falls into. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or ID on the label. Once the class of the device is determined, refer to the following corresponding statement.

Class A Equipment

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 instructions, 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 personal expense.

Class B Equipment

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

■ Reorient or relocate the receiving antenna.

■ Increase the separation between the equipment and receiver.

■ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

■ Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Declaration of Conformity for Products Marked with FCC Logo, United States Only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. For questions regarding your product, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000

Or call 1-800- 652-6672 (1-800-OK COMPAQ) (For continuous quality improvement, calls may be recorded or monitored.)

For questions regarding this FCC declaration, contact:

Compaq Computer Corporation
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000

Or call (281) 514-3333

To identify this product, refer to the Part, Series, or Model number found on the product.

Canadian Notice (Avis Canadien)

Class A Equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B Equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

European Union Notice

Products with the CE Marking comply with both the EMC Directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC) issued by the Commission of the European Community.

Compliance with these directives implies conformity to the following European Norms (in brackets are the equivalent international standards):

■ EN55022 (CISPR 22) - Electromagnetic Interference

■ EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity

■ EN60950 (IEC950) - Product Safety

Japanese Notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

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

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です　この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Taiwanese Notice

警告使用者:
這是甲類的資訊產品,在居住的
環境中使用時,可能會造成射頻
干擾,在這總情況下,使用者會
被要求探取某些適當的對策。

Laser Devices

The CD-ROM drive contains a laser device. All Compaq systems equipped
with a laser device comply with safety standards, including International
Electrotechnical Commission (IEC) 825. With specific regard to the laser, the
equipment complies with laser product performance standards set by
government agencies as a Class 1 laser product. The product does not emit
hazardous light; the beam is totally enclosed during all modes of customer
operation and maintenance.

Laser Safety Warnings

⚠ **WARNING:** To reduce the risk of fire, bodily injury, and damage
to the equipment, observe the following precautions:- Do not
operate controls, make adjustments, or perform procedures to a
laser device other than those specified herein or in the CD-ROM
drive installation guide.- Allow only Compaq Authorized Service
Technicians to repair the laser equipment.

Compliance with CDRH Regulations

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and
Drug Administration implemented regulations for laser products on August 2,
1976. These regulations apply to laser products manufactured from August 1,
1976. Compliance is mandatory for products marketed in the United States.

Compliance with International Regulations

All Compaq systems equipped with CD-ROM drives comply with appropriate safety standards including IEC 825.

Laser Product Label

The following label or equivalent is located on the surface of your CD-ROM drive.

This label indicates that the product is classified as a CLASS 1 LASER PRODUCT. This label appears on a laser device installed in your product.

Laser Information

Laser Type	Semiconductor GaAlAs
Wave Length	780 nm +/- 35 nm
Divergence Angle	53.5 degrees +/- 0.5 degrees
Output Power	Less than 0.2 mW /10,869 W·m-2 sr-1
Polarization	Circular 0.25
Numerical Aperture	0.45 inches +/- 0.04 inches

Battery Replacement Notice

Your computer is provided with a lithium battery powered Real-Time Clock circuit. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Replacement is to be done by a Compaq Authorized Service Provider using the Compaq spare designated for this product. For more information about Real-Time Clock battery replacement or proper disposal, contact your Compaq Authorized Reseller or your Authorized Service Provider.

> **WARNING:**   To reduce the risk of personal injury, do not attempt to recharge the battery, disassemble it, immerse it in water, or dispose of it in fire.

> **WARNING:**   To reduce the risk of personal injury, do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water. Do not expose to temperatures higher than 60°C.

Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. In order to forward them to recycling or proper disposal, please use the public collection system or return them to Compaq, your authorized Compaq Partners, or their agents.

Mouse Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Appendix B
Electrostatic Discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

To prevent electrostatic damage, observe the following precautions:

■ Avoid hand contact by transporting and storing products in static-safe containers.

■ Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.

■ Place parts on a grounded surface before removing them from their containers.

■ Avoid touching pins, leads, or circuitry.

■ Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

■ Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

■ Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

■ Use conductive field service tools.

■ Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an Authorized Compaq Reseller install the part.

NOTE: For more information on static electricity, or assistance with product installation, contact your Authorized Compaq Reseller.

Appendix C
Power Cord Set Requirements

The power cord set meets the requirements for use in the country where you purchased your equipment. The voltage selection switch allows you to select the appropriate line voltage for your server.

Power cord sets for use in other countries must meet the requirements of the country where you use the server. For more information on power cord set requirements, contact your Authorized Compaq Dealer.

General Requirements

The requirements listed below are applicable to all countries:

■ The length of the power cord must be at least 6.0 feet (1.8 m) and a maximum of 12 feet (3.7 m).

■ The power cord set must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord will be used.

■ The power cord set must have a minimum current capacity and nominal voltage rating of 10 A/125 volts AC, or 10A/250 volts AC, as required by each country's power system.

■ The appliance coupler must meet the mechanical configuration of an EN60320/IEC 320 Standard Sheet C13 Connector, for mating with the appliance outlet on the computer.

Country-Specific Requirements

Use the following table to identify the appropriate accredited agency in your country.

**Table C-1
Power Cord Set Requirements - By Country**

Country	Accredited Agency	Applicable Note Numbers
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	SETI	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	JIS	3
Norway	NEMKO	1
Sweden	SEMKO	1
Switzerland	SEV	1
United Kingdom	BSI	1
United States	UL	2

Notes:

1. Flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm^2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

2. Flexible cord must be Type SVT or equivalent, No. 18 AWG, 3-conductor. Wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V).

3. Appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, 1.0 mm^2 conductor size. Wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.

Appendix D
POST Error Messages

Error Messages

This appendix lists the error codes that you may encounter during the Power-On Self-Test (POST) or after restarting the workstation, the probable source of the problem, and what steps you can take to resolve the error condition.

	POST Error Messages and Codes	
Error Code	Probable Source of Problem	Action
101-ROM Error	System ROM checksum	Contact your Compaq authorized service provider.
101-Option ROM Checksum Error	Options ROM checksum	Contact your Compaq authorized service provider.
102-System Board Failure	DMA, timers, etc.	Replace the Expansion Cage System Board. Run the Computer Setup utility.
162-System Options Error	No diskette drive or mismatch in drive type	Run Computer Setup or Windows NT utilities.
162-System Options Not Set	Configuration incorrect	Run Computer Setup or Windows NT utilities.
163-Time & Date Not Set	Invalid time or date in configuration memory	Run Computer Setup or Windows NT utilities.
164-Memory Size Error	Configuration memory incorrect	Run Computer Setup or Windows NT utilities.

continued

POST Error Messages and Codes *continued*

Error Code	Probable Source of Problem	Action
172-1 Configuration Nonvolatile Memory Invalid	NVRAM Configuration error	Allow system to complete boot. Reboot.
		If condition persists, contact your Compaq authorized service provider.
201-Memory Error	RAM failure	Contact your Compaq authorized service provider.
202-Memory Type Mismatch	RAM failure	Contact your Compaq authorized service provider.
203-Memory Address Error	RAM failure	Contact your Compaq authorized service provider.
205-Memory Error	Cache memory error	Run the Computer Checkup or Diagnostics utility.
206-Secondary cache controller failure	Cache memory controller or RAM failure	Run Computer Setup and Diagnostics utilities.
207-ECC Corrected Single Bit Errors in DIMM/SIMM Pair(s)	A memory error on one of the installed DIMMs has been detected and corrected with the system's ECC logic. The workstation will continue to operate correctly with this error.	Run Diagnostics to get more information; then contact your Compaq authorized service provider.
210-Invalid Memory Configuration Detected. Maximum of 512 MB of Memory Supported. System Halted.	RAM failure	Remove memory from system until total amount is less than 512 MB.

POST Error Messages and Codes *continued*

Error Code	Probable Source of Problem	Action
212-Failed Processor	Failed processor (X is 0 or 1)	Contact your Compaq authorized service provider.
301-Keyboard Error	Keyboard failure	Check that you do not have a key stuck or something on the keyboard.
		Ensure that the keyboard is plugged in.
		Replace the keyboard if necessary.
303-Keyboard Controller Error	I/O keyboard controller	Contact your Compaq authorized service provider.
304-Keyboard or System Unit Error	Keyboard	Contact your Compaq authorized service provider.
40X-Parallel Port X Address Assignment Conflict	Both external and internal ports are assigned to parallel port X.	Run Computer Setup or Windows NT utilities.
402-Monochrome Adapter Failure	Monochrome display controller	Replace the monochrome display controller.
404-Parallel Port Address Conflict Detected	Both external and internal ports are assigned to parallel port X.	Run Computer Setup or Windows NT utilities.
501-Display Adapter Failure	Graphics display controller	Replace the memory upgrade module.

continued

POST Error Messages and Codes *continued*

Error Code	Probable Source of Problem	Action
601-Diskette Controller Error	Diskette controller circuitry	Contact your Compaq authorized service provider.
605-Diskette Drive Type Error	Mismatch in drive type	Run Computer Setup or Windows NT utilities.
611-Primary Floppy Port Address Assign-ment Conflict	Configuration error	Run Computer Setup or Windows NT utilities.
612-Secondary Floppy Port Address Assignment Conflict	Configuration error	Run Computer Setup or Windows NT utilities.
1151-System Board COM Port 1 Address Assignment Conflict	Configuration Error	Run Computer Setup
1152- System Board COM Port 2 Address Assignment Conflict	Configuration Error	Run Computer Setup
1155-COM Port Address Assignment Conflict	Both external and internal serial ports.	Run Computer Setup or Windows NT utilities.
1610-Temperature violation detected	The system is too hot.	Turn off the workstation and let it cool off. If the condition persists, Run Diagnostics to get more information; then contact your Compaq authorized service provider.

continued

POST Error Messages and Codes *continued*

Error Code	Probable Source of Problem	Action
1611-Fan failure detected	The fan is not operating properly.	Run Diagnostics to get more information; then contact your Compaq authorized service provider.
1720-IntelliSafe Hard Drive Detects Imminent Failure	IDE hard drive(s)	Contact your Compaq authorized service provider.
1720-SMART Hard Drive Detects Imminent Failure	SCSI hard drive(s)	Contact your Compaq authorized service provider.
1771-Primary Disk Port Address Assignment Conflict	IDE configuration	Run Computer Setup
1772-Secondary Disk Port Address Assignment Conflict	IDE configuration	Run Computer Setup
1780- Disk 0 failure	IDE hard drive failure	Contact your Compaq authorized service provider.
1781-Disk 1 Failure	IDE hard drive failure	Contact your Compaq authorized service provider.
1782-Disk Controller Failure	IDE circuitry failure	Contact your Compaq authorized service provider.
1790-Disk 0 Failure (Secondary)	IDE hard drive failure	Contact your Compaq authorized service provider.
1791-Disk 1 Failure (Secondary)	IDE hard drive failure	Contact your Compaq authorized service provider.
1792-Secondary Disk Controller Failure	IDE circuitry failure	Contact your Compaq authorized service provider.

continued

Compaq Professional Workstation 5100 Reference Guide

POST Error Messages and Codes   *continued*

Error Code	Probable Source of Problem	Action
1793-Secondary Controller or Disk Failure	An error has been detected with the CD-ROM interface.	Run the Diagnostics utility.
A Critical Error Occurred Prior to this Power-Up	Critical failure (POST) recorded into the wellness log.	None.
A Collectable Memory Error Occurred Prior to this Power-Up	Single-bit ECC during POST.	None.
This Workstation has experienced an NMI (Hardware Error)	As indicated.	None.
Fixed Disk Parameter Table or BIOS Error System Halted	Configuration or hardware failure.	Run the Setup and Diagnostics utilities.
XX000Y ZZ Parity Check 2	Parity RAM failure.	Run the Setup and Diagnostics utilities.
Audible (beep)	Power-on successful.	None.
Invalid Electronic Serial Number	The electronic serial number is corrupt.	Run the Setup and Diagnostics utilities.
(RESUME= "F1" KEY)	As indicated to continue.	Press the F1 key.

Appendix E
Installing a New Battery

When your workstation no longer automatically displays the correct date and time, it may mean the battery providing power to the real-time clock needs to be replaced. Battery life is usually about five years. Prior to installing the replacement battery, read the following section.

Running Computer Setup

Computer Setup automatically detects and configures most Compaq components, including Compaq hard drives. If your workstation has a Compaq hard drive you do not need to run Computer Setup prior to installing the replacement battery. However, if your workstation has a third-party hard drive, you **MUST** complete the following steps before installing the replacement battery:

1. Run Computer Setup and record the drive type displayed in the System Configuration Summary.

2. If the drive type number is 65 or 66, record the drive parameters.

   Drives with these designators are user-defined types, also called soft-drive types. Whenever the nonvolatile memory (CMOS) has become invalid, such as after the installation of a new battery, drive parameters must be entered manually for these user-defined drives.

After you have completed the battery installation, run Computer Setup and use the drive table parameters recorded earlier to reconfigure the system.

> **NOTE**: Drive parameters must be reentered after battery installation in order to reconfigure the hard drive. The hard drive is inoperable until this is done.

Installation Procedures

The battery that came with the workstation is permanently installed on the system board. If the original battery becomes inoperative, you must install a second battery.

⚠️ **WARNING:**   The system board contains a clock/CMOS lithium battery. The lithium battery may explode if mistreated. The battery is soldered in place and may not be removed. Do not abuse or disassemble. Use only replacement batteries supplied by Compaq Computer Corporation.

To install the replacement battery, follow these steps:

1. If the workstation is on, turn it off, then unplug the power cord from the wall outlet.

2. Remove the workstation cover and the expansion board cage.

3. Remove and discard the protective covering on the adhesive on the hook and loop fastener on the back of the battery and attach the battery to the side of the power supply.

4. Plug the battery connector onto pins 1-4 on the system board.
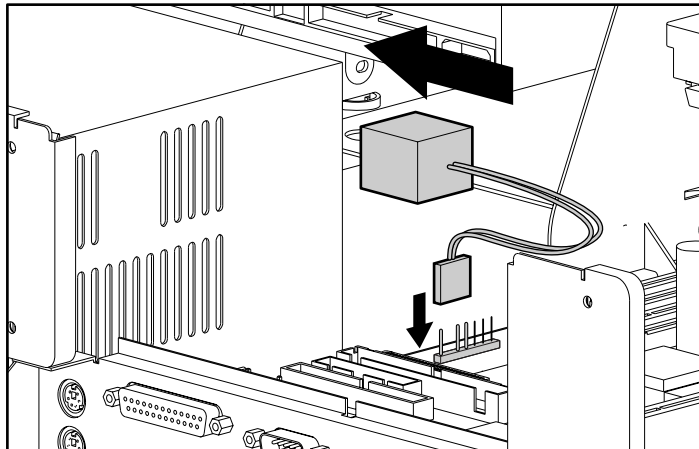
Figure E-1.   Attaching the replacement battery

5.   Change the jumper from pins 6-7 ❶ to pins 5-6 ❷.
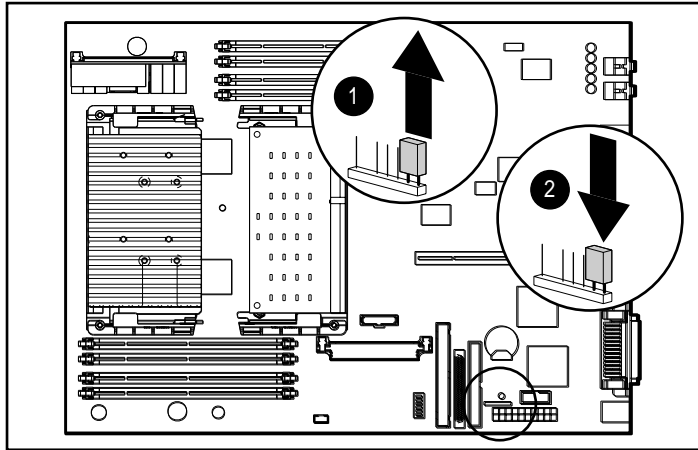
Figure E-2.   Changing the jumper from pins 6-7 to pins 5-6

6.   Place the pale blue sticker included with the battery kit above the power connector on the back of the workstation

7.   Replace the expansion board cage and workstation cover.

> **IMPORTANT:**   Before replacing the expansion board cage, read "Important Guidelines for Expansion Board Cage Replacement" in Chapter 7.

8.   Plug the power cord into an electrical outlet.

9.   Turn on the workstation.

10.   Run Computer Setup to reconfigure the system.

11.   If the workstation has a Compaq hard drive, you have now successfully completed the installation.

If the workstation has a third-party hard drive, you must reconfigure the hard drive using the parameters you recorded before you began the installation procedure.

Appendix F
External Connectors

Pin Assignments

The following tables provide pin assignments for each external connector on the Compaq Professional Workstation 5100.

Table F-1
Keyboard
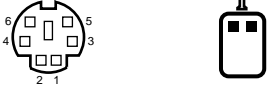
Connector and Icon (Orange)	Pin	Signal
	1	Data
	2	Unused
	3	Ground
	4	+5 VDC
	5	Clock
	6	Unused

Table F-2
Mouse

Connector and Icon (Green)	Pin	Signal
	1	Data
	2	Unused
	3	Ground
	4	+5 VDC
	5	Clock
	6	Unused

Table F-3
Parallel Interface
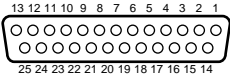
Connector and Icon	Pin	Signal
13 12 11 10 9 8 7 6 5 4 3 2 1 25 24 23 22 21 20 19 18 17 16 15 14	1	Strobe
	2	Data Bit 0
	3	Data Bit 1
	4	Data Bit 2
	5	Data Bit 3
	6	Data Bit 4
	7	Data Bit 5
	8	Data Bit 6
	9	Data Bit 7
	10	Acknowledge
	11	Busy
	12	Paper End
	13	Select
	14	Auto Linefeed
	15	Error
	16	Initialize Printer
	17	Select IN
	18-25	Signal Ground

Table F-4
Serial Interfaces
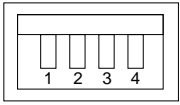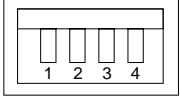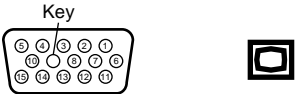
Connector and Icon	Pin	Signal
	1	Carrier Detect
	2	Receive Data
	3	Transmit Data
	4	Data Terminal Ready
	5	Signal Ground
	6	Data Set Ready
	7	Request to Send
	8	Clear to Send
	9	Ring Indicator

Table F-5
USB

Connector	Pin	Signal
	1	VCC
	2	-Data
	3	+Data
	4	Ground

Table F-6
Monitor

Connector and Icon	Pin	Signal
Key	1	Red Analog
	2	Green Analog
	3	Blue Analog
	4	Monitor ID Bit2
	5	Ground
	6	Ground Analog
	7	Ground Analog
	8	Ground Analog
	9	Not Connected
	10	Ground
	11	Monitor ID Bit 0
	12	Bi-directional Data (SDA)*
	13	Horizontal Sync
	14	Vertical Sync
	15	Data Clock (SCL)*

* For DDC support (I^2C monitors)

Table F-7
Ethernet RJ-45
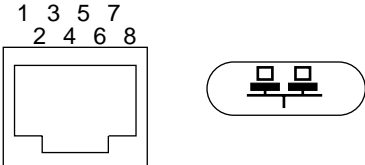
Connector and Icon	Pin	Signal
1 3 5 7 2 4 6 8	1	(+) Transmit Data
	2	(-) Transmit Data
	3	(+) Receive Data
	4	Unused
	5	Unused
	6	(-) Receive Data
	7	Unused
	8	Unused

Table F-8
Ethernet BNC
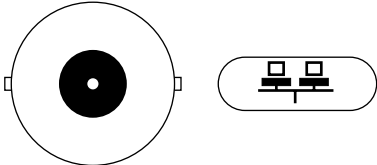
Connector and Icon	Pin	Signal
	1 (Inside)	Data
	2 (Outside)	Ground

Table F-9
Wide-Ultra SCSI-3 Connector

Connector and Icon			
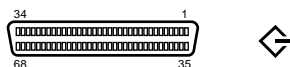
Pin	Signal	Pin	Signal
1-16	Ground	51 - 52	TERMPWR
17 - 18	TERMPWR	53	Reserved
19	Reserved	54	Ground
20 - 34	Ground	55	-ATN
35	-D12	56	Ground
36	-D13	57	-BSY
37	-D14	58	-ACK
38	-D15	59	-RST
39	-DP1	60	-MSG
40	-D0	61	-SEL
41	-D1	62	-C/D
42	-D2	63	-REQ
43	-D3	64	-I/O
44	-D4	65	-D8
45	-D5	66	-D9
46	-D6	67	-D10
47	-D7	68	-D11
48	-DP0		
49 - 50	Ground		

Table F-10
Line-In Audio Connector

Connector and Icon		
◎	♪⇐	1/8-inch Miniphone

Table F-11
Line-Out Audio Connector

Connector and Icon		
◎	♪⇒	1/8-inch Miniphone

Table F-12
Microphone Connector

Connector and Icon (Blue)		
◎	🎤	Stereo 1/8-inch Miniphone

Table F-13
Headphone Connector

Connector and Icon	
	Stereo 1/8-inch Miniphone

Appendix G
Smart Cover Sensor Settings

Sensor Settings

Refer to the following table for information on switch settings, enabling or disabling the Smart Cover Sensor. The physical location of the SW1-S1 switch is illustrated on the hood labels affixed to the underside of the workstation cover.

Smart Cover Sensor				
SW1-S1 Setting	Setup Password	Smart Cover Sensor	Cover Removed	Message Displayed
On	Enabled	Disabled	Yes	No message displayed. No setup password required.
On	Enabled	Disabled	No	No message displayed. No setup password required.
On	Enabled	Notify user	Yes	Cover removed message displayed. No setup password required. Press F1 to continue startup.
On	Enabled	Notify user	No	No message displayed. No setup password required.
On	Enabled	Setup password	Yes	Cover removed message displayed. No setup password required. Press F1 to continue startup.

continued

Smart Cover Sensor *continued*

SW1-S1 Setting	Setup Password	Smart Cover Sensor	Cover Removed	Message Displayed
0n	Enabled	Setup password	No	No message displayed. No setup password required.
0n	Disabled	Disabled	Yes	No message displayed. No setup password required.
0n	Disabled	Disabled	No	No message displayed. No setup password required.
0n	Disabled	Notify user	Yes	Cover removed messaged displayed. No setup password required. Press F1 to continue startup.
0n	Disabled	Notify user	No	No message displayed. No setup password required.
0ff	Enabled	Disabled	Yes	No message displayed. No setup password required.

continued

Smart Cover Sensor *continued*

SW1-S1 Setting	Setup Password	Smart Cover Sensor	Cover Removed	Message Displayed
Off	Enabled	Disabled	No	No message displayed. No setup password required.
Off	Enabled	Notify user	Yes	Cover removed message displayed. No setup password required. Press F1 to continue startup.
Off	Enabled	Notify user	No	No message displayed. No setup password required.
*Off	Enabled	Setup password	Yes	Cover removed message displayed. Setup password required. Press F1 to continue startup.
Off	Enabled	Setup password	No	No message displayed. No setup password required.
Off	Disabled	Disabled	Yes	No message displayed. No setup password required.

continued

Smart Cover Sensor *continued*

SW1-S1 Setting	Setup Password	Smart Cover Sensor	Cover Removed	Message Displayed
**Off	Disabled	Disabled	No	No message displayed. No setup password required.
Off	Disabled	Notify user	Yes	Cover removed message displayed. No setup password required. Press F1 to continue startup.
Off	Disabled	Notify user	No	No message displayed. No setup password required.

*   Maximum security setting

** Default

Setting SW1-S1 to off, enabling the setup password, and choosing the "Setup Password" option for the Smart Cover Sensor setting will provide maximum security. If the cover is removed for any reason while the maximum security setting is in effect, the workstation will pause during the startup process. The startup process will not continue unless the setup password is entered.

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