



## **Professional Workstation AP200**

Reference Guide

**Third Edition (February 1999)**  
**Part Number 352620-003**  
**Compaq Computer Corporation**

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### Compaq Professional Workstation AP200 Reference Guide

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# Contents

## About This Guide

Text Conventions .....	ix
Symbols in Text .....	x
Symbols on Equipment .....	x
Rack Stability .....	xi
Getting Help .....	xi
Compaq Website .....	xi
Telephone Numbers .....	xii

## Chapter 1

### Product Features

Standard Configuration Features .....	1-1
Front Panel Components .....	1-3
Rear Panel Connectors .....	1-5
Drive Positions .....	1-6
Using the Compaq Enhanced Keyboard .....	1-7
Windows Logo Key .....	1-8
Keyboard Lights .....	1-9
Keyboard Tilt Feet .....	1-10
Serial Number Location .....	1-10

## Chapter 2

### Software

Installing Windows NT Workstation Over a Network .....	2-1
Setup Software .....	2-2
ROM BIOS .....	2-2
Power-On Self-Test .....	2-3
Runtime Services .....	2-3
Upgrading the ROM BIOS .....	2-3
Boot Block ROM .....	2-4
Computer Setup .....	2-4

**Software** *continued*

Compaq Diagnostics .....	2-9
Creating a Diagnostics Diskette .....	2-9
Computer Checkup (TEST).....	2-10
View System Information (INSPECT).....	2-10
Using Computer Checkup (TEST) or View System Information (INSPECT).....	2-11
Reinstalling Your Software .....	2-13
Registration .....	2-13

**Chapter 3****Intelligent Manageability**

Asset Management.....	3-2
Compaq Diagnostics for Windows NT .....	3-3
Fault Management .....	3-5
SMART III Hard Drive Fault Prediction .....	3-5
Ultra ATA Integrity Monitoring.....	3-5
ECC Fault Prediction and Pre-Failure Warranty.....	3-6
Proactive Backup.....	3-6
Surge-Tolerant Power Supply .....	3-6
Security Management .....	3-7
Disabling Diskette Boot or Diskette Write.....	3-8
Disabling a Serial Port or Parallel Port .....	3-9
Password Security .....	3-10
QuickLock .....	3-15
Configuration Management.....	3-16
Upgrading the ROM.....	3-17
FailSafe Boot Block ROM .....	3-19
Remote Security Management .....	3-21
Remote Wakeup and Remote Shutdown.....	3-22
Remote System Installation.....	3-23
Replicating Your Setup .....	3-23
Dual-State Power Button.....	3-24
Power Management .....	3-25
Advanced Configuration and Power Interfaces (ACPI) Capable.....	3-25
Compaq Support Software CD Kit and Support from the Compaq Website.....	3-26
Integration Management.....	3-27
Desktop Management Interface.....	3-27
Compaq Management Agents for Workstations .....	3-28
Compaq Management Solutions Partners Program .....	3-29

## Chapter 4

### Hardware Upgrades

Installation Sequence .....	4-3
When to Reconfigure the Workstation .....	4-4
Removing the Workstation Access Panel.....	4-5
Removing the Front Bezel.....	4-6
Removing the Bezel Blank .....	4-7
Changing from a Minitower to a Desktop Configuration .....	4-8
Changing from a Desktop to a Minitower Configuration .....	4-11
Internal Components.....	4-14
Installing Additional Memory .....	4-15
Installing an Expansion Board.....	4-18
Removing an Expansion Board.....	4-21
Installing Additional Drives .....	4-23
Using the Cable-Select Feature with IDE Ultra ATA Devices.....	4-24
Installing Optional SCSI Devices.....	4-25
Installing a SCSI Device .....	4-27
Installing an IDE CD-ROM or Tape Drive .....	4-28
Installing a 3.5-Inch Drive into the Third-height, 5.25-Inch Drive Bay .....	4-31
Removing a Drive from a Drive Bay.....	4-34
Replacing the Battery .....	4-36

## Chapter 5

### Network Communications

Connecting to an Ethernet Network .....	5-2
Attaching a Network Cable to the RJ-45 Connector.....	5-2
Installing the Network Driver.....	5-3

## Chapter 6

### Troubleshooting

Helpful Hints .....	6-2
Solving Minor Problems.....	6-3
Solving Disk Problems .....	6-4
Solving SCSI Problems .....	6-7
Solving Display Problems .....	6-8
Solving Printer Problems.....	6-12
Solving Hardware Installation Problems.....	6-13
Solving Network Problems.....	6-14

**Troubleshooting** *continued*

Solving Memory Problems .....	6-18
Solving CD-ROM Problems .....	6-20
Solving Software Problems .....	6-20
Troubleshooting Using Compaq Intelligent Manageability Features .....	6-21
Contacting Compaq Customer Support .....	6-21

**Appendix A****Regulatory Compliance Notices**

Federal Communications Commission Notice .....	A-1
Class A Equipment .....	A-1
Class B Equipment .....	A-2
Modifications .....	A-2
Cables .....	A-2
Declaration of Conformity for Products Marked with FCC Logo, United States Only ...	A-3
Mouse Compliance Statement .....	A-4
Canadian Notice (Avis Canadien) .....	A-4
Class A Equipment .....	A-4
Class B Equipment .....	A-4
European Union Notice .....	A-4
Japanese Notice .....	A-5
Taiwan Notice .....	A-5
Laser Devices .....	A-6
Laser Safety Warnings .....	A-6
Compliance with CDRH Regulations .....	A-6
Compliance with International Regulations .....	A-6
Laser Product Label .....	A-7
Laser Information .....	A-7
Battery Replacement Notice .....	A-8

**Appendix B****Electrostatic Discharge**

Grounding Methods .....	B-2
-------------------------	-----

**Appendix C****Power Cord Set Requirements**

General Requirements .....	C-1
Country-Specific Requirements .....	C-2

*Appendix D*

**Routine Workstation Care and Shipping Preparation**

Routine Computer Care .....	D-1
CD-ROM Drive Precautions.....	D-2
Operation .....	D-2
Cleaning.....	D-2
Safety .....	D-2
Shipping Preparation .....	D-3

*Appendix E*

**Error Codes**

*Appendix F*

**Specifications**

*Appendix G*

**Clearing Configuration Memory**

**Index**





## About This Guide

This 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:

<b>Keys</b>	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.
<i>FILENAMES</i>	File names appear in uppercase italics.
<i>Menu Options,</i> <i>Command Names,</i> <i>Dialog Box Names</i>	These appear in initial capital letters.
COMMANDS, DIRECTORY NAMES, and DRIVE NAMES	These always appear in uppercase.
Type	When you are instructed <i>to type</i> information, type the information <b>without</b> pressing the <b>Enter</b> key.
Enter	When you are instructed <i>to enter</i> information, type the information and then press the <b>Enter</b> 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

## Symbols on Equipment

These icons are 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 personal 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.

---

## Rack Stability



**WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizing feet are attached to the rack if it is a single rack installations
- The racks are coupled together in multiple rack installations.

A rack may become unstable if more than one component is extended for any reason. Extend only one component at a time.

---

## 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 1-800-386-2172

For Compaq technical support phone numbers outside the United States and Canada, visit the Compaq website at:

<http://www.compaq.com>

## Chapter 1

# Product Features

### Standard Configuration Features

- Microsoft Windows NT Workstation 4.0 operating system software (preinstalled)
- One standard 400-MHz or 450-MHz Intel Pentium II processor or a 500-MHz Intel Pentium III processor featuring MMX technology with a 100-MHz system bus
- A 512-kilobyte (K) secondary (L2) cache integrated into the processor module (not expandable)
- A minimum of 64 megabytes (MB) of ECC unregistered synchronous dynamic random access memory (SDRAM) standard; expandable to 768 MB installed in dual inline memory modules (DIMMs)
- Compaq flexible ATX chassis, configurable either as a minitower or desktop workstation
- One Accelerated Graphics Port (AGP) controller installed in the AGP slot.
- For information about the graphics controller installed on your workstation, refer to the appropriate guide on the SmartStart for Workstations CD under X:\DOCS\GRAPHICS, where X is your CD-ROM drive designation. To view one of the .pdf files, use Adobe Acrobat Reader. To install Adobe Acrobat Reader, refer to the *Software Installation Guide*.
- Three PCI expansion slots; one ISA expansion slot; one “combination” slot for either a PCI or an ISA expansion board; and one Accelerated Graphics Port (AGP) slot.
- BIOS in a flash memory device supporting PCI auto-configuration
- 200-watt surge-tolerant continuous power supply, switch-selectable for 115- and 230-VAC operation
- One multimode, 25-pin enhanced parallel connector
- Two RS-232C-compatible 9-pin serial connectors

## 1-2 Product Features

- Two Universal Serial Bus (USB) connectors
- Five drive bays:
  - One 1.44-MB, 3.5-inch high-density diskette drive in a 5.25-inch, one-third height bay
  - Two 5.25-inch, half-height bays for optional drives
  - Two 3.5-inch, one-third height bays for hard drives
- One of the following SMART drives depending on model:
  - One Ultra ATA SMART hard drive with drive fault prediction
  - One Wide-Ultra SCSI SMART hard drive with drive fault prediction
- One Compaq NC3121 Fast Ethernet Network Interface Controller (10/100 Mb/s Auto-sensing Ethernet controller) PCI card with Wake-on-LAN, capable of operating in either 10Base-T or 100Base-TX environments
- One IDE 32X CD-ROM drive
- One PremierSound 16-bit audio board and enhanced speaker
- Compaq Enhanced Keyboard, featuring Microsoft Windows-specific keys
- Compaq three-button mouse
- Security features including passwords
- Intelligent Manageability features designed to make Compaq computers easier to inventory, configure, upgrade, troubleshoot, protect, and maintain
- Compaq Computer Setup utilities and diagnostic features
- Compaq support software and device drivers (preinstalled)

**NOTE:** For specific information about your system configuration, see the “View System Information (INSPECT)” section in Chapter 2 of this guide.

## Front Panel Components

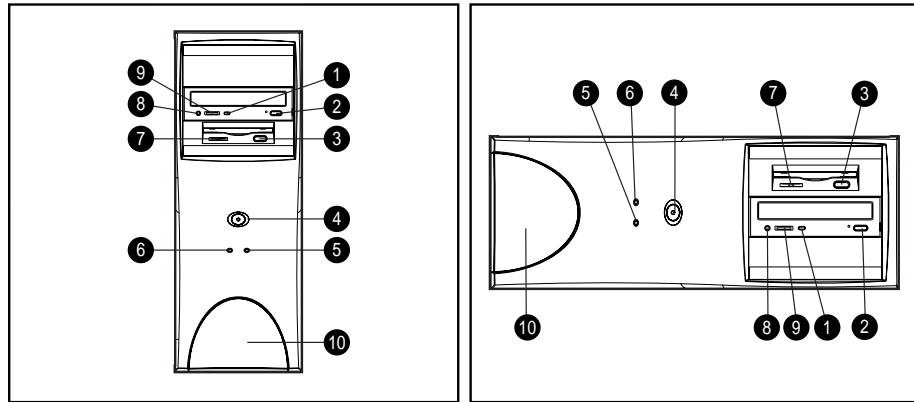


Figure 1-1. Identifies the front panel components

**Table 1-1**  
**Front Panel Components**

Identifier	Component
①	CD-ROM drive activity light
②	CD-ROM eject button
③	Diskette eject button
④	Power button
⑤	Hard drive activity light
⑥	Power-on light

*Continued*

## 1-4 Product Features

### Front Panel Components *Continued*

Identifier	Component
7	Diskette drive activity light
8	CD-ROM headphone jack
9	CD-ROM volume
10	Logo trim piece provided for the desktop form factor



**WARNING:** This equipment is designed for connection to a grounded (earthed) outlet. The grounding type plug is an important safety feature. To avoid the risk of electrical shock or damage to the equipment, do not disable this feature.



## Rear Panel Connectors

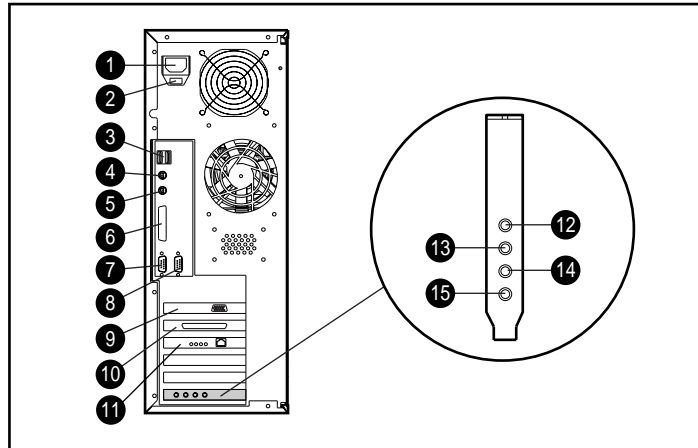


Figure 1-2. Rear panel connectors

**Table 1-2**  
**Rear Panel Connectors**

Identifiers	Connector	Identifiers	Connector
❶	Power cord connector	❾	AGP connector
❷	Voltage select switch	❿	External SCSI connector
❸	Two universal serial bus (USB) connectors	⓫	NIC connector
❹	Keyboard connector	⓬	Headphone connector
❺	Mouse connector	⓭	Line-out audio connector
❻	Parallel connector	⓮	Line-in audio connector
❼	Serial connector	⓯	Microphone connector
❽	Second serial connector		

## Drive Positions

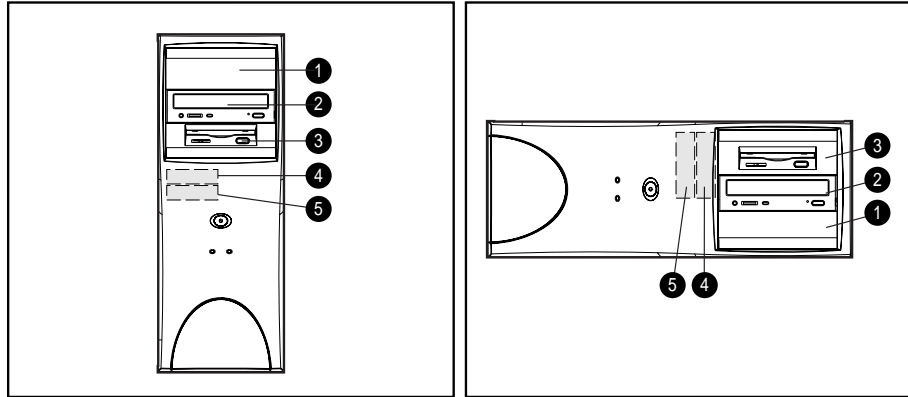


Figure 1-3. Identifies drive positions

**Table 1-3**  
**Drive Positions**

Identifiers	Connector
① and ②	Two 5.25-inch, half-height bays for optional drives
③	One 1.44-MB, 3.5-inch high-density diskette drive mounted in the 5.25-inch, one-third height bay
④ and ⑤	Two 3.5-inch, one-third height bays for hard drives

**NOTE:** Drive bay numbers are stamped on the chassis, behind the front bezel.

To verify the type and size of the storage devices installed in your computer, run Compaq Computer Setup. See Chapter 2, "Software," for more information.

## Using the Compaq Enhanced Keyboard

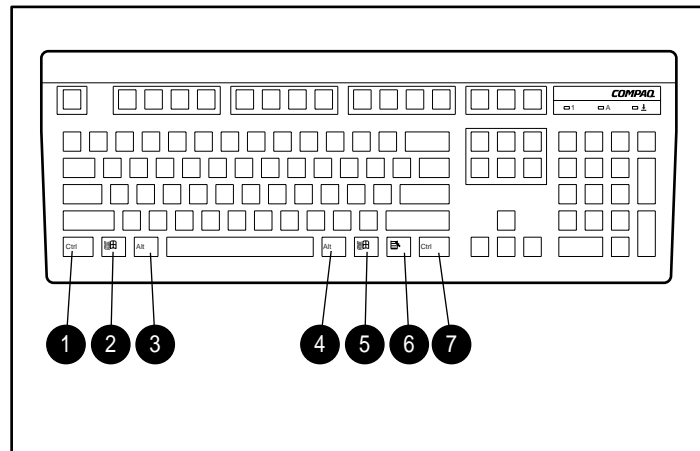


Figure 1-4. Identifying special function keys

**Table 1-4**  
**Special Function Keys**

Identifier	Key	Function
① ⑦	<b>Ctrl</b>	Used in combination with another key, its effect depends on the application software you are using.
② ⑤	<b>Windows Logo*</b>	Used to open the Start menu in Microsoft Windows NT Workstation 4.0. Used in combination with other keys to perform other functions. (See next table.)
③ ④	<b>Alt</b>	Used in combination with another key, its effect depends on the application software you are using.
⑥	<b>Application</b>	Used (like the right mouse button) to open pop-up menus in a Microsoft Office application. May perform other functions in other software applications.

\*Keys available in select geographic regions

## Windows Logo Key

The following table shows you how to use the Windows Logo key in combination with other keys to perform certain functions in Windows NT Workstation 4.0.

---

**Table 1-5**  
**Key Combinations**

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

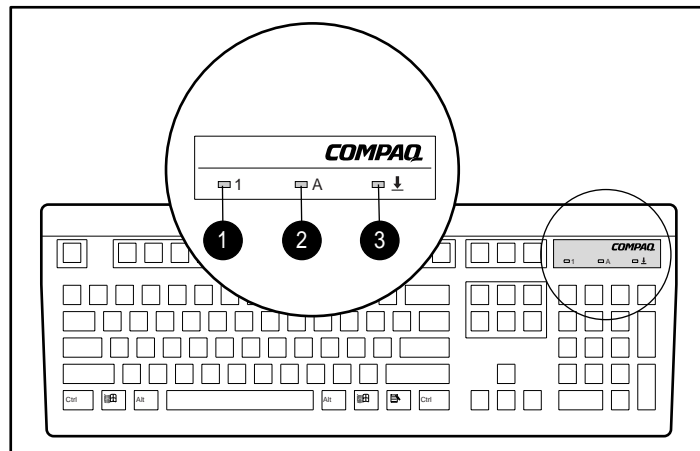


Figure 1-5. Identifying keyboard lights

**Table 1-6**  
**Keyboard Lights**

Identifier	Description	Function
❶	Num lock	When Num lock is enabled (light is on), the numeric keypad is activated.
❷	Caps lock	When Caps lock is enabled (light is on), all text appears in uppercase when typed.
❸	Scroll lock	When Scroll lock is enabled (light is on), the screen is prevented from scrolling.

## Keyboard Tilt Feet

The keyboard has feet on the bottom to tilt the keyboard to a comfortable typing angle.

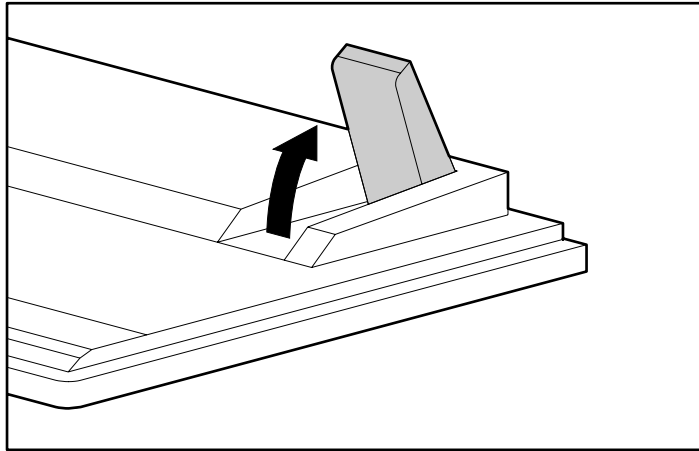


Figure 1-6. Locating the keyboard tilt feet

## Serial Number Location

Each computer has a unique serial number, located on the corner of the computer access panel and also on the rear panel of the computer. You may need to have this number available if contacting Compaq customer service.

## Chapter 2

# Software

The Microsoft Windows NT Workstation 4.0 operating system is preinstalled on the workstation and will be configured for you automatically the first time you turn on the workstation. Compaq support software will also be installed at that time.

**NOTE:** Certain drivers and utilities are available only in English. You can obtain the latest version of these files in English in one of the following ways:

- Compaq Support Software CD kit
- Compaq website at <http://www.compaq.com>

---

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

---

## Installing Windows NT Workstation Over a Network

Network installation is used primarily for installing or upgrading Windows NT Workstation 4.0 over a local area network. It can also be used to install additional drivers or files with Microsoft Windows NT Workstation.

**NOTE:** This capability does not imply the grant of a site license for Microsoft Windows NT Workstation and should only be used to install the operating system on workstations for which the appropriate software license has already been obtained.

Use this installation method if you choose to deploy Microsoft Windows NT Workstation using a distribution share point over a network connection.

For instructions on installing Windows NT Workstation over a network, download the appropriate SoftPak from the Compaq website at <http://www.compaq.com>.

## Setup Software

Compaq Setup software provides information you will need about the workstation if you need assistance from Compaq Customer Support. These tools can also be used:

- To change factory default settings, and to set or change the system configuration, which may be necessary when you add or remove hardware
- To determine if all the devices installed on the workstation are recognized by the system and functioning properly
- To determine information about the operating environment of the workstation
- To solve system configuration errors detected but not automatically fixed during the Power-On Self-Test (POST)
- To establish and manage passwords and other security features
- To establish and manage energy-saving timeouts

## ROM BIOS

Your workstation contains a set of software called Basic Input/Output System (BIOS), which is stored in Read Only Memory (ROM) on the system board. The BIOS contains a set of routines for running Power-On Self-Test (POST) and for accessing hardware specific information. The ROM is upgradable via the ROMPaq software utility.



## 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
3. Initialize processor(s)
4. Detect and spin up all drives
5. Boot from, in sequence, either a CD a diskette, or the hard drive

Refer to Appendix E, "Error Codes," for a listing of POST error messages and steps you can take to resolve an error condition.

## 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 about the type of processor 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

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 BIOS may be downloaded from the Compaq website at <http://www.compaq.com>. BIOS upgrades are called ROMPaq.

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

## 2-4 Software

### Boot Block ROM

The Boot Block ROM cannot be upgraded.

For more information about Boot Block ROM, see the “FailSafe Boot Block ROM” in Chapter 3.

### Computer Setup

Computer Setup allows you to configure your workstation’s hardware and resolve resource conflicts. On the Compaq Professional Workstation AP200, Computer Setup is built into the reprogrammable system ROM and is shipped in English only. To add an additional language for Computer Setup, refer to the *Software Installation Guide*.

---

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

---

## Using Computer Setup

To access the Computer Setup utilities menu:

1. Turn on or restart the workstation. If you are in Windows, click *Start*, then *Shut Down*. Restart the workstation.
2. When the F10 Setup message appears in the lower-right corner of the screen, press the **F10** key.

**NOTE:** If you do not press the **F10** key while the message is displayed, you must turn the workstation off, then on again, to access the utility. The **F12** key initiates Network Service Boot for Remote System installation. See Chapter 3 of this guide for more information about this feature.

The Computer Setup menu appears with the following menu headings: File, Storage, Security, Power, and Advanced. See Table 2-1 for a description of the features available in Computer Setup.

3. Press the arrow keys or the **Tab** key to select the option you want, then press the **Enter** key. To return to the main menu, press the **Esc** key.
4. To apply and save changes, select File, then *Save Changes and Exit*. If you selected an option that automatically restarted the workstation, changes were applied at that time. If you have made changes that you do **not** want applied, select *Ignore Changes and Exit*. If you have already applied changes you now want to eliminate, select *Set Defaults and Exit*. This option will restore the original system defaults.

**Table 2-1**  
**Computer Setup**

Task	Computer Setup Selection
View the product name, processor type/speed/stepping, CPU serial number, system ROM date, system board revision, installed memory size, and asset tracking number	Select <i>File</i> , then select <i>System Information</i> .
Set the system time and date	Select <i>File</i> , then select <i>Set Time and Date</i> .
View the currently installed drive A: (preinstalled diskette drive) and drive B: devices and set resources for diskette drives	Select <i>Storage</i> , then select <i>Diskette Drives</i> .
Enable/disable diskette booting and diskette writing <b>NOTE:</b> After saving changes to Removable Media, the workstation will restart. Turn the workstation off, then on, manually.	Select <i>Storage</i> , then select <i>Removable Media</i> .
View information regarding IDE devices connected to the system <b>NOTE:</b> ATAPI devices (CD-ROM, tape) are listed as ATAPI devices.	Select <i>Storage</i> , then select <i>IDE Devices</i> .
Allows you to set hard drive to Ultra-DMA (Ultra-ATA), EDMA, or PIO mode operation.	Select <i>Storage</i> for the IDE Drive Timing.
Enables/disables IDE drive translation	Select <i>Storage</i> for the IDE Drive Translation.
Specify the boot order of installed peripheral devices (such as LS-120 drive, diskette drive, hard drive, SCSI, or CD-ROM devices)	Select <i>Storage</i> , then select <i>Boot Order</i> .
Set the energy saver mode to Advanced, Disabled, or Minimal	Select <i>Power</i> , then select <i>Energy Saver</i> .

*Continued*

**Computer Setup** *Continued*

<b>Task</b>	<b>Computer Setup Selection</b>
Enable/disable timeouts or manually select timeout values <b>NOTE:</b> These selections appear only if energy saver mode is set to Advanced.	Select <i>Power</i> , then select <i>Timeouts</i> .
Set the power button configuration (on/off or suspend/wakeup) and enable/disable power LED blink in suspend mode <b>NOTE:</b> This selection does not appear if the energy saver mode is disabled.	Select <i>Power</i> , then select <i>Energy Saver Options</i> .
Enable the Power-On Password. For more information, see the section "Security Management" in Chapter 3.	Select <i>Security</i> , then select <i>Power-On Password</i> .
Enable/disable network server mode, keyboard QuickLock screen when locked, and/or QuickLock in energy saver mode. For more information, see the section "Security Management" in Chapter 3. <b>NOTE:</b> This selection appears only if a Power-On Password is set.	Select <i>Security</i> , then select <i>Password Options</i> .
Enable the Setup (administrator) Password. For more information, see the section "Security Management" in Chapter 3.	Select <i>Security</i> , then select <i>Setup Password</i> .
Enable/disable serial, parallel, and USB ports and audio security	Select <i>Security</i> , then select <i>Device Security</i> .
Set the Asset Tag. See Chapter 3 for more information.	Select <i>Security</i> , then select <i>System IDs</i> .
Set the keyboard locale setting (for example, English or German) for the System ID entry. Also allows setting of Chassis serial number if current number is invalid.	Select <i>Security</i> , then select <i>System IDs</i> .
Set the POST mode (QuickBoot) and enable/disable POST messages	Select <i>Advanced</i> , then select <i>Power-On Self Test</i> .

*Continued*

**Computer Setup** *Continued*

<b>Task</b>	<b>Computer Setup Selection</b>
Set resources for onboard system devices (serial port, parallel port, and so forth)	Select <i>Advanced</i> , then select <i>Onboard Devices</i> .
View the currently installed PCI devices and their IRQ settings and/or and reconfigure IRQ settings for these devices or disable them entirely  <b>NOTE:</b> This option will not appear if there are non PnP devices currently installed.	Select <i>Advanced</i> , then select <i>PCI Devices</i> .
View the current settings of Plug and Play (PnP) devices and set resources for installed boards	Select <i>Advanced</i> , then select <i>ISA PnP Devices</i> .
Enable/disable PCI bus mastering, PCI reset on warm boot, and PCI VGA palette snooping	Select <i>Advanced</i> , then select <i>Bus Options</i> .
Set ISA back-to-back I/O (fast/legacy) delay and bus priority (ISA/PCI)	Select <i>Advanced</i> , then select <i>Bus Options</i> .
Set the printer mode (flexible/standard)	Select <i>Advanced</i> , then select <i>Device Options</i> .
Set the <b>Num Lock</b> state at power-on	Select <i>Advanced</i> , then select <i>Device Options</i> .
Specify which VGA controller is the primary (or boot) VGA controller  <b>NOTE:</b> This selection appears only if there are multiple PCI graphics controllers in your system.	Select <i>Advanced</i> , then select <i>PCI VGA Configuration</i> .
Save the system configuration to a blank 1.44 MB diskette	Select <i>File</i> , then select <i>Save to Floppy</i> .
Restore the system configuration from a diskette	Select <i>File</i> , then select <i>Restore from Floppy</i> .
Restore factory default settings and exit Computer Setup	Select <i>File</i> , then select <i>Set Defaults and Exit</i> .
Exit Computer Setup without applying or saving any changes	Select <i>File</i> , then select <i>Ignore Changes and Exit</i> .
Save changes to the system configuration and exit Computer Setup	Select <i>File</i> , then select <i>Save Changes and Exit</i> .

## Compaq Diagnostics

Compaq diagnostics consist of the following software tools:

- Computer Checkup (TEST)
- View System Information (INSPECT)
- Compaq Diagnostics for Windows NT

Computer Checkup (TEST) and View System Information (INSPECT) are discussed in this chapter. Before you can use these tools, you must create a diagnostics diskette. See the section “Creating a Diagnostics Diskette” in this chapter for instructions. Compaq Diagnostics for Windows NT is discussed in Chapter 3.

### Creating a Diagnostics Diskette

To create a diagnostics diskette:

1. With Windows NT Workstation 4.0 installed and running, insert a blank, formatted diskette into the diskette drive.
2. Insert the SmartStart for Workstations CD into the CD-ROM drive.
3. From the SmartStart for Workstations Home Page, click *Manual System Configuration*.
4. Click *Install Optional Compaq Software*.
5. Click *Create a Diagnostics Diskette*.
6. Follow the instructions on the screen.

## Computer Checkup (TEST)

**NOTE:** Computer Checkup will detect Compaq hardware. Devices from other manufacturers may not be detected.

Use Computer Checkup (TEST):

- To determine if all the devices installed on the workstation are recognized by the system and functioning properly. Running TEST is optional but recommended after installing or connecting a new device.
- To save, print, or display the information generated by TEST. You should 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.

For information on using TEST, see the section “Using Computer Checkup (TEST) or View System Information (INSPECT)” in this chapter.

## View System Information (INSPECT)

**NOTE:** View System Information will detect Compaq hardware. Devices from other manufacturers may not be detected.

Use View System Information (INSPECT):

- To view information about the system once it has been configured.
- To save, print, or display the information generated by INSPECT. You should 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.



Information provided by INSPECT includes:

- Contents of the operating system startup files
- Current memory configuration
- ROM versions
- Type of processor and coprocessor
- Diskette, CD-ROM, tape, or hard drives installed
- Active printer and communications interfaces
- Modem type installed
- Graphics settings

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

For information on using INSPECT, see the section “Using Computer Checkup (TEST) or View System Information (INSPECT)” in this chapter.

## Using Computer Checkup (TEST) or View System Information (INSPECT)

**NOTE:** Before you run Computer Checkup (TEST) or View System Information (INSPECT), you must create a diagnostics diskette. Refer to the section “Creating a Diagnostics Diskette” in this chapter for instructions.

1. Restart your workstation from the diagnostics diskette you have created.
2. Press **Enter** to bypass the welcome screen.
3. Select either *Computer Checkup (TEST)* or *View System Information (INSPECT)*, then press the **Enter** key.
4. Follow the instructions on the screen. See the section below, “When Running TEST,” for further instructions.
5. To exit either TEST or INSPECT, press the **Esc** key to reach the Exit option, then press the **Enter** key.

**When running TEST:**

1. Select the option to view the device list. A list of the installed hardware devices appears.
2. Verify that TEST correctly detected the devices installed. This utility will detect all devices manufactured by Compaq; devices from other manufacturers may not be detected.
  - If the list is correct, select *OK* and go on to Step 3.
  - If the list is incorrect, make sure that any new devices are properly installed. If you do find an installation problem, call your Compaq Authorized Dealer, Reseller, or Service Provider.
3. 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.
4. Follow the instructions on the screen as the diagnostic tests are run on the devices. Record any error message numbers and have them available when you contact your Compaq Authorized Dealer, Reseller, or Service Provider for assistance.

## Reinstalling Your Software

If the preinstalled software on your workstation has been deleted, you can install Windows NT Workstation 4.0 and the Compaq support software using SmartStart for Workstations. For more information about SmartStart for Workstations, refer to the *Software Installation Guide*. There are also online help files located on the SmartStart for Workstations CD.

## Registration

Be sure to register your workstation with Compaq. Registration establishes a record of ownership and gives you an opportunity to receive product announcements, updates, and other communications periodically, if you choose to do so.

## ***Chapter 3***

# **Intelligent Manageability**

Intelligent Manageability combines innovative hardware technology with systems management tools from Compaq and other leading vendors to make Compaq workstations easier to inventory, troubleshoot, protect, and maintain. Intelligent Manageability features focus on:

- Asset Management
- Fault Management
- Security Management
- Configuration Management
- Integration Management

## **Asset Management**

The Compaq Asset Management solution begins with AssetControl, hardware designed and built into new Compaq workstations, key components, and monitors. AssetControl features make it easy and inexpensive to maintain an accurate, up-to-date inventory of these devices. These features:

- Provide detailed inventory information about various components, including:
  - Manufacturer, model, and serial number of Compaq workstations, monitors, hard drives, and dual inline memory modules (DIMMs)
  - Asset tag
  - System board and ROM revision level
- Allow you to view, print, or electronically save this data and other system configuration details, using:
  - Compaq Diagnostics for Windows NT
  - System management products from the Compaq Management Solutions Partners
  - Management software products supporting the Desktop Management Interface revision 2.0 (DMI 2.0)
- Simplify and help ensure the accuracy of inventory and accounting procedures
- Streamline service calls by giving the administrator fast access to the Compaq workstation configuration and history
- Simplify remote software distribution procedures by allowing the system administrator to identify software and revision levels remotely

## Compaq Diagnostics for Windows NT

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

- System overview
- AssetControl information
- Input devices
- Communications ports
- Storage devices
- Graphics information
- Memory configuration
- Security management settings
- System health
- Operating system
- Microsoft Windows

### 3-4 Intelligent Manageability

To install Compaq Diagnostics for Windows NT, refer to the *Software Installation Guide*.

#### Using Compaq Diagnostics for Windows NT

1. Select the Compaq Diagnostics for Windows NT icon or the Compaq Diagnostics icon, located in the Control Panel.

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

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

**NOTE:** 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.

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

4. Review and print this information and, if necessary, discuss it with your authorized Compaq Reseller or Service Provider.

**NOTE:** To print the information, click *File*, then select *Print*. Select one of the following options: *Detailed Report (All Categories)*, *Summary Report (All Categories)*, or *Current Category*. Click *OK* to print the report you selected.

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

## Fault Management

Fault Management features combine innovative hardware and software technology to prevent the loss of critical data and minimize unplanned downtime.

When a fault occurs, the workstation displays a Local Alert message containing a description of the fault and any recommended actions. You can then view current system health by using Compaq Diagnostics for Windows NT. If the workstation is connected to a network managed by Compaq Insight Manager or other Simple Network Management Protocol (SNMP)-based management products (for example, HP OpenView or IBM Tivoli TME10 NetView), the workstation also sends a fault notice to the network management application.

### SMART III Hard Drive Fault Prediction

SMART III is an extension of SMART II capability. A SMART III hard drive is able not only to monitor and report on its own health, but to fix problems **before** they become failures that result in data losses. The SMART III drive periodically executes read scans of the entire disk. These read scans take place during periods of inactivity. During the scan, the disk drive will determine the “health” of each data sector and move data from questionable areas of the disk to known good areas of the disk. To determine the “health” of the data during the scan, the drive uses sophisticated methods of Cyclic Redundancy Codes (CRC) and Error Checking and Correcting (ECC) codes to flag potentially bad areas of the disk. With today’s multi-gigabyte hard drives, there are areas of the disk that are not read or written by applications for long periods of time. The SMART III technology will patrol the entire disk so that when unused or infrequently used parts of the disk are called upon, the data will be available.

### Ultra ATA Integrity Monitoring

Ultra ATA Integrity Monitoring monitors the integrity of data as it is transferred between an Ultra ATA hard drive and the system’s core logic. If the workstation detects an abnormal number of transmission errors, the screen displays a Local Alert message with recommended actions. If the workstation is on a network, an alert is also sent over the network to the system administrator.



## **ECC Fault Prediction and Pre-Failure Warranty**

When the workstation encounters an excessive number of error checking and correcting (ECC) memory errors, the screen displays a Local Alert message. This message contains detailed information about the errant memory module, allowing you to take action **before** you experience non-correctable memory errors. The Pre-Failure Warranty for ECC memory modules allows you to replace these modules, free of charge, before the modules actually fail.

## **Proactive Backup**

Proactive Backup software initiates a tape backup upon receiving notice of an impending SMART III hard drive failure. Third-party products that provide this feature include Seagate Backup Exec SMART Client and Cheyenne SMART Drive Agent.

## **Surge-Tolerant Power Supply**

An integrated surge-tolerant power supply provides greater reliability when the workstation is hit with an unpredictable power surge. This power supply is rated to withstand a power surge of up to 2,000 volts without incurring any system downtime or data loss.

## Security Management

Your workstation includes security features to protect the workstation and data from unauthorized access. You can view Security Management features and current settings by using Compaq Diagnostics for Windows NT, or system management applications from the Compaq Management Solution Partners.

**Table 3-1**  
**Security Features**

Feature	Purpose	How It Is Established
Removable Media Boot Control	Prevents booting from the removable media drives	From the Computer Setup menu
Removable Media Write Control	Prevents writing to the removable media drives	From the Computer Setup menu
Serial or Parallel Interface Control	Prevents transfer of data through the integrated serial or parallel interface	From the Computer Setup menu
Power-on Password	Prevents use of the workstation until the password is entered. This can apply to both initial workstation startup and restarts.	From the Computer Setup menu
QuickLock	Disables keyboard and mouse interface without exiting applications. The Power-on Password must be set to enable QuickLock.	From the Computer Setup menu
Setup Password	Prevents reconfiguration of the workstation (use of the Computer Setup utility) until the password is entered	From the Computer Setup menu.

**NOTE:** For more information about Computer Setup, see Chapter 2, "Software."

## Disabling Diskette Boot or Diskette Write

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**IMPORTANT:** If you disable the diskette drive, the FailSafe Boot Block ROM will ignore the disabled component to accommodate a system ROM recovery in the event a system ROM failure occurs.

---

To disable the factory settings (that is, to *prevent boot from a diskette* or *prevent save to a diskette*), follow these steps:

1. Turn on the workstation.
2. When you see the words “**F10=Setup**” in the bottom-right corner of the screen, press **F10**.

**NOTE:** You have approximately two seconds to press **F10**. If you do not press **F10** during this time, you must manually turn the workstation off, then on again to access the utility.

3. From the main menu, select *Storage*, then select *Removable Media*.
4. Press the **up/down arrow keys** to select the function you want to disable.
5. Press the **left/right arrow keys** to select *Disable*.
6. Save the configuration and exit the utility.
7. Restart the workstation.

**NOTE:** Compaq recommends that you establish a Setup Password to prevent another person 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, follow these steps:

1. Turn on the workstation.
2. When you see the words “**F10=Setup**” in the bottom-right corner of the screen, press **F10**.

**NOTE:** You have approximately two seconds to press **F10**. If you do not press **F10** during this time, you must manually turn the workstation off, then on again to access the utility.

3. From the main menu, select *Advanced*, then select *Onboard Devices*.
4. Press the **up/down arrow keys** to select the Serial or Parallel Port you want to disable.
5. Press the **left/right arrow keys** to select *Disable*.
6. Save the configuration and exit the utility.
7. Restart the workstation.

## Password Security

The workstation supports security password features, which can be established through the Compaq Computer Setup Utilities menu.

### Establishing a Setup Password Using Computer Setup

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

1. Turn on or restart the workstation.
2. When you see the words “**F10=Setup**” appear in the bottom-right corner of the screen, press **F10**.

**NOTE:** If you do not press the **F10** key while the message is displayed, you must manually turn the workstation off, then on again to access the utility

3. From the main menu, select *Security*, then select *Setup Password* and follow the instructions on the screen.
4. Save the configuration and exit the utility.
5. Restart the workstation.

### Establishing a Power-On Password Using Computer Setup

Establishing a Power-On Password through Computer Setup prevents access to the workstation when power is turned on unless the password is entered. The password must be entered each time the workstation is turned on, when the key icon appears on the monitor.

1. Turn on or restart the workstation.
2. When you see the words “**F10=Setup**” appear in the bottom-right corner of the screen, press **F10**.

**NOTE:** If you do not press the **F10** key while the message is displayed, you must manually turn the workstation off, then on again to access the utility.

3. From the main menu, select *Security*, then select *Power-On Password* and follow the instructions on the screen.
4. Save the configuration and exit the utility.
5. Restart the workstation.

### Entering a Power-On Password

To enter a Power-On Password:

1. Turn on or restart 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 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 or Setup Password**

1. Turn on or restart the workstation. To change the Setup Password, run Computer Setup.
2. When the key icon appears, type your current password, a slash (/) or alternate delimiter character, your new password, another slash (/) or alternate delimiter character, and your new password again as shown:

current password/new password/new password

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

The new password takes effect the next time you turn on the workstation.

### **Deleting a Power-On or Setup Password**

1. Turn on or restart the workstation. To delete the Setup Password, run Computer Setup.
2. When the key icon appears, type your current password followed by a slash (/) or alternate delimiter character as shown:

current password/

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

### Clearing Passwords

To disable the Power-On or Setup Password features, or to clear the Power-On or Setup Passwords if you forget them and cannot access the workstation system or Computer Setup:

1. Set SW1, Position 1, to the ON position.
2. Turn on the workstation and allow the operating system to start. This clears the current passwords and disables the password features.
3. To re-enable the password features, turn off the workstation and set SW1, Position 1, to the OFF position.
4. Turn on the workstation and establish new passwords. See the beginning of this section, "Password Security," for instructions.



**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.

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

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

\* For Bosnia-Herzegovina, Croatia, Slovenia, and Yugoslavia

## QuickLock

QuickLock disables the keyboard and mouse interface without exiting open applications.

### Enabling QuickLock

1. Turn on or restart the workstation.
2. When you see the words “**F10=Setup**” appear in the bottom-right corner of the screen, press **F10**.

**NOTE:** If you do not press the **F10** key while the message is displayed, you must manually turn the workstation off, then on again to access the utility.

3. From the main menu, select *Security*, then select *Password Options*.
4. To enable QuickLock, press the **up/down arrow keys** to move the *Keyboard Quicklock* selection, then use the **left/right arrow keys** to select *Enable*.
5. To enable Quicklock in Energy Saver mode, press the **up/down arrow keys** to move the *Quicklock in Energy Saver mode* selection, then use the **left/right arrow keys** to select *Enable*.
6. Save the configuration and exit the utility.
7. Restart the workstation.

### Disabling the Keyboard and Mouse Interface

Enter the QuickLock key combination (**Ctrl+Alt+L**) to disable the keyboard and mouse (or other input device connected to the mouse connector). The applications you are running cannot be accessed, but remain in view.

### **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.

## **Configuration Management**

Configuration Management features include:

- Upgrading the ROM:
  - Local ROM flash
  - Remote ROM Flash
- FailSafe Boot Block ROM
- Remote Security Management
- Remote Wakeup
- Remote Shutdown
- Remote System Installation
- Setup replication ability
- Advanced Configuration and Power Interface (ACPI)-ready hardware
- Dual-state power button
- *Compaq Support Software CD* kit and support from the Compaq website

**NOTE:** Your workstation must be connected to a network to take advantage of all Configuration Management features. Use of some features also requires an established Setup Password.

## Upgrading the ROM

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 can:

- Order an upgraded user ROMPaq diskette from Compaq.
- Order the *Compaq Support Software CD* kit.
- Download the latest ROMPaq images from the Compaq website at: <http://www.compaq.com>



**CAUTION:** For maximum ROM protection, be sure to establish a Setup Password. The Setup Password prevents unauthorized ROM upgrades.

---

### Local ROM Upgrade

To upgrade the ROM after you receive or download a user ROMPaq diskette:

1. Insert the user ROMPaq diskette in the diskette drive and boot the workstation.
2. Enter the Setup Password, if prompted.

**NOTE:** If the Setup Password is entered correctly, the ROMPaq utility will take over and run the ROM upgrade. If the Setup Password is entered incorrectly, 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 safely upgrade the ROM on remote Compaq 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 designed to ensure authenticity and minimize potential corruption. 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:** Your workstation must be powered on, or turned on through Remote Wakeup, to take advantage of Remote ROM Flash. Use of Remote ROM Flash also requires an established Setup Password.

For more information on enabling Remote ROM Flash, refer to the online *Remote Management Administrators Guide*, included with the Remote Management Administration Tools, and available in the *Support Software CD* kit or at the Compaq website at: <http://www.compaq.com>.

## FailSafe Boot Block ROM

The FailSafe Boot Block ROM facilitates 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 user ROMPaq diskette that will program the system ROM with a valid image.

---

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

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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:

1. Remove any diskettes from the diskette drive and turn off the power.
2. Insert a user ROMPaq 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.

If the system successfully starts from the diskette and successfully reprograms the ROM, the three keyboard lights will turn on.

**3-20** *Intelligent Manageability*

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

**Table 3-3**  
**Keyboard Light Combinations**

<b>Num Lock ❶</b>	<b>Caps Lock ❷</b>	<b>Scroll Lock ❸</b>	<b>Meaning and Required Action</b>
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 user ROMPaq diskette is not present, is bad, or the drive is not ready.  Insert a valid user ROMPaq diskette, turn the power off, then turn the power back on.
OFF	OFF	ON	ROM upgrade failed.  Try another user 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.

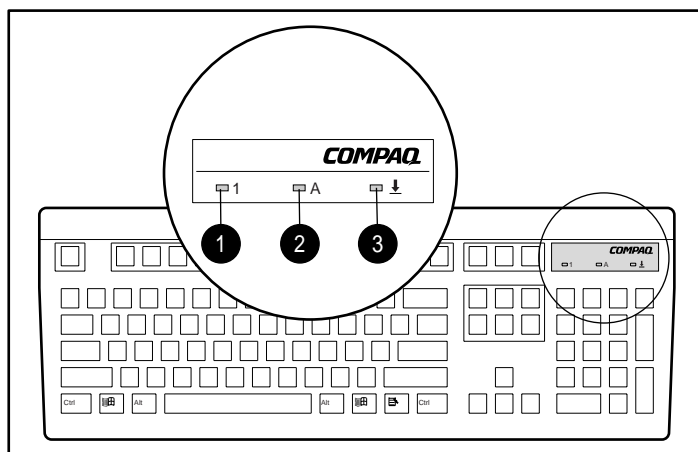


Figure 3-1. Identifying keyboard lights

## Remote Security Management

Remote Security Management allows the system administrator to safely set or modify security features on remote Compaq 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.

**NOTE:** Your workstation must be powered on, or turned on through Remote Wakeup, to take advantage of Remote Security Management. Use of Remote Security Management also requires an established Setup Password.



### 3-22 Intelligent Manageability

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 workstations.

For more information about the Remote Management Setup software and enabling Remote Security Management, refer to the online *Remote Management Administrators Guide* included with the Remote Management Administration Tools, and available in the *Support Software CD* kit or at the Compaq website: <http://www.compaq.com>.

## Remote Wakeup and Remote Shutdown

Your workstation has a network card installed that supports the Compaq Remote Wakeup and Remote Shutdown functions. These functions allow a system administrator to power on and power off a client workstation from a remote location, supported by PC LAN management tools.

**NOTE:** Third-party software tools are required to remotely distribute software.

Remote Wakeup allows the network interface controller to continue functioning, even when power to the workstation has been turned off.

**NOTE:** The workstation continues to consume a small amount of electricity even after you turn it off. Only when you disconnect the power cord from the electrical outlet does the workstation stop consuming electricity.

For more information on using Remote Wakeup and Remote Shutdown, refer to the online *Remote Management Administrators Guide* included with the Remote Management Administration Tools, and available in the *Support Software CD* kit or at the Compaq website: <http://www.compaq.com>.

## Remote System Installation

Remote System Installation allows you to start and set up your system using the software and configuration information located on a network server. The Remote System Installation feature is usually used as a system setup and configuration tool, and can be used for the following tasks:

- Formatting a hard drive
- Installing an operating system
- Installing application software or drivers

To initiate Remote System Installation, press **F12** when the *F12=Network Service Boot* message appears in the lower-right corner of the screen.

## Replicating Your Setup

This procedure gives an administrator the ability to easily copy one setup configuration to other workstations of the same model. This enables faster, more consistent configuration of multiple workstations. To replicate your setup:

1. Turn on or restart the workstation.
2. When you see the words “**F10=Setup**” appear in the bottom-right corner of the screen, press **F10**.

**NOTE:** If you do not press the **F10** key while the message is displayed, you must turn off the workstation, then on again to access the utility.

3. From the main menu, select *File*, then select *Save to Floppy* and follow the instructions on the screen.
4. To replicate the configuration, select *File*, then select *Restore from Floppy* and follow the instructions on the screen.

## Dual-State Power Button

On a power-managed system, the power button can function either as an on/off switch or as a suspend button. The suspend feature does not turn off power altogether, but instead causes the workstation to enter a low-power standby. This allows you to quickly power down without closing applications, and to quickly return to the same operational state without any data loss.

---

**IMPORTANT:** The power button suspend feature is not functional in NT 4.0. Under NT, the power switch will act as a normal on/off button even if listed as "Suspend" in the *F10 Setup*. If you attempt to put an NT system into suspend mode, you could potentially lose valuable data.

---

To change the power button's configuration:

1. Turn on or restart the workstation.
2. When you see the words "**F10=Setup**" in the bottom-right corner of the screen, press the **F10** key.

**NOTE:** If you do not press the **F10** key while the message is displayed, you must manually turn off the workstation, then on again to access the utility.

3. From the main menu, select *Power*, then select *Energy Saver Options*.

---

**IMPORTANT:** The Energy Saver Options selection is available only if the energy saver mode is enabled (set to Minimal or Advanced).

---

4. Press the **left/right arrow keys** to set the Power Button configuration to either *Normal (On/Off)* or *Suspend/Wakeup*.
5. Save the configuration and exit the utility.

After configuring the power button to function as a suspend button, press the power button to put the system in a very low power state (suspend). Press the button again to quickly bring the system out of suspend to full power status. To completely turn off all power to the system, press and hold the power button for four seconds.

**NOTE:** If you have selected the *Blink LED during Energy Save* option in Computer Setup, the power-on light will blink once every two seconds while the workstation is in suspend. See the “Using Computer Setup” section in Chapter 2 of this guide for more information.

## Power Management

Use the *Timeouts* option under the Power menu in Computer Setup to enable, customize, or disable standby timeouts. This feature shuts down certain components of the workstation when they are not in use, saving energy without having to shut down the workstation.

**NOTE:** When using a power-managed system, disable monitor timeouts in Computer Setup first, then establish the settings in the operating system 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 Desktop, then choose Properties.

## Advanced Configuration and Power Interfaces (ACPI) Capable

ACPI defines a hardware interface that allows a standard way to integrate power management features throughout the workstation system, including hardware, operating system, and application software. This enables the workstation to automatically turn on and off peripherals such as CD-ROMs, network cards, hard drives, and printers. With the ACPI technology, peripherals will also be able to activate the workstation. For example, the simple act of inserting a CD-ROM will turn on the workstation and activate a monitor.

Since the Compaq Professional Workstation AP200 ships standard with the ACPI hardware, you will be able to use ACPI features once future ACPI-enabled Microsoft operating systems become available. When the new Microsoft operating systems are released, you will need to upgrade the ROM BIOS, driver, and operating system to take advantage of the ACPI features.

## **Compaq Support Software CD Kit and Support from the Compaq Website**

Compaq has made the task of 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 set of compact discs contains the latest device drivers, utilities, and ROM images needed to run your Compaq workstation.
- You can download the drivers and utilities from the Compaq website: <http://www.compaq.com>

**NOTE:** Both the *Compaq Support Software CD Kit* and the website 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 critical updates.

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

- You can purchase a single CD that gives you one-time access to the latest support software.
- You can purchase a yearly subscription that delivers up to 12 monthly CDs.

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 or on the lower-right side of the workstation. This number is necessary for all purchases.

## Integration Management

Integration Management features include:

- Desktop Management Interface
- Compaq Management Agents for Workstations
- Compaq Management Solutions Partners Program

## Desktop Management Interface

The Desktop Management Task Force (DMTF) is an industry body created in 1992 with the goal of standardizing systems manageability. DMTF established the Desktop Management Interface (DMI) framework to standardize access to PC configuration data. Compaq, as a Steering Committee and Technical Committee member of the DMTF, delivers hardware and software instrumentation that supports the DMI standard.

## **Compaq Management Agents for Workstations**

Using the industry-standard Simple Network Management Protocol (SNMP) found in Microsoft Windows NT Workstation, Compaq Management Agents for Workstations allows the system administrator to remotely view AssetControl data, configuration data, memory change alerts, NIC performance data, and contact information.

**NOTE:** For more information about the Integration Management features, refer to the *Workstation Software Reference Addendum*. The addendum is located on the SmartStart for Workstations CD at *X:\DOCS\ADDEND\INDEX.HTM* (where X is your CD-ROM drive designation).

## Compaq Management Solutions Partners Program

Currently, Compaq delivers management solutions under Microsoft Windows NT Workstation through the Compaq Management Solutions Partners Program. This Compaq initiative ensures compatibility and integration of Intelligent Manageability features with leading systems management products. The partnership ensures that the benefits of Intelligent Manageability are accessible through a broad range of vendors. This allows customers to use their tools of choice to remotely manage their Compaq workstations more confidently and cost-effectively.

Compaq Management Solutions Partners include:

- BindView (Net Inventory)
- Intel (LANDesk Management Suite)
- Microsoft Corporation (Systems Management Server)
- Novell (ManageWise)
- PLATINUM Technology (AutoConfigure)
- Seagate (Desktop Management Suite)
- Tally Systems (Cenergy)
- BMC (Patrol)
- Computer Associates (Unicenter TNG)
- Hewlett Packard (OpenView)
- Tivoli (TME10)



## ***Chapter 4***

# **Hardware Upgrades**

This chapter explains how to remove the workstation access panel and convert the minitower workstation to a desktop or the desktop workstation to a minitower. It also explains how to install the following optional upgrade or replacement hardware:

- Additional memory
- Expansion boards
- Optional drives
- Replacement battery

## 4-2 Hardware Upgrades

This chapter also includes information about when to reconfigure the workstation to ensure that it recognizes the newly installed hardware.

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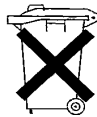
**IMPORTANT:** Compaq recommends that you finish the setup procedures for the preinstalled software **before** you install any optional hardware or third-party devices that were not included with your workstation. For more information about the setup procedures, refer to the *Software Installation Guide*.

---



**WARNING:** This workstation contains a lithium-ion battery pack. There is a risk of fire and chemical burn if the battery pack is handled improperly. Do not disassemble, crush, puncture, short external contacts, dispose of in water or fire, or expose it to temperatures higher than 60°C (140°F).

---



In North America, dispose of nickel metal hydride or lithium-ion batteries by taking advantage of the Compaq battery recycling program. You will be provided with a postage-paid battery pack mailer pre-addressed to a reclamation facility where the metals are recycled. Call the telephone number listed in the section “About This Guide” at the beginning of this guide for more information.

In Europe, do not dispose of batteries with general household waste. Dispose of or recycle them by using the public collection system or by returning them to Compaq, your authorized Compaq partners, or their agents.

## Installation Sequence

It is very important that you follow this sequence of steps to ensure the proper installation of any optional equipment.

1. If the workstation is already on, turn it off and disconnect the power cord from the wall outlet.
2. Disconnect the keyboard, monitor, network cable, and other external equipment connected to the workstation.



**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. See Appendix B for more information.

---

3. Open the workstation by removing its access panel. See “Removing the Workstation Access Panel” in this chapter for instructions.
4. Install any optional equipment. For instructions, see the applicable sections of this chapter and the documentation provided with the optional equipment.
5. Replace the workstation access panel.
6. Reconnect the keyboard, monitor, network cable, and other external devices.
7. Reconnect the power cord to the wall outlet.
8. Turn on the monitor, workstation, and other external devices.
9. Reconfigure the workstation, if necessary. See the following section, “When to Reconfigure the Workstation.”

## When to Reconfigure the Workstation

System configuration is the process of specifying the devices and programs that make up a system. When you add or remove optional devices, you must reconfigure the workstation by running Computer Setup for the changes to be recognized.

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 of this guide for more information on Computer Setup.

## Removing the Workstation Access Panel

1. Turn off the workstation and any external devices.
2. Disconnect the power cord from the grounded AC outlet, the network cable from the system, then disconnect any external devices.



**CAUTION:** Before removing the workstation access panel, ensure that the workstation is turned off and that the power cord is disconnected from the grounded AC outlet.

---

3. Remove the two screws that secure the access panel to the workstation chassis.
4. Slide the access panel back about 1 inch (2.5 cm), then lift it off the unit.

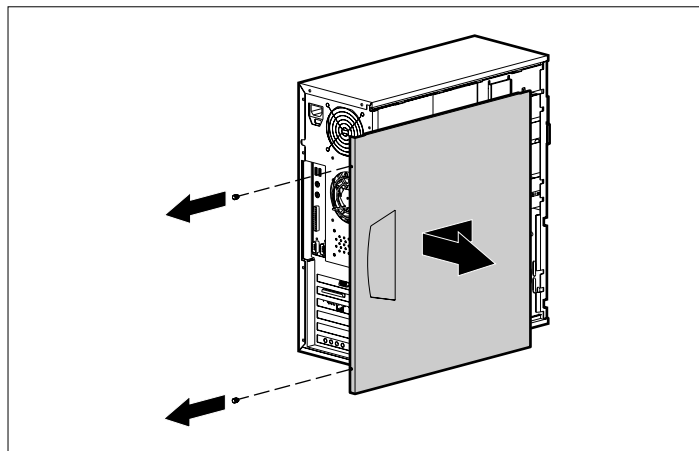


Figure 4-1. Removing the workstation access panel

To replace the access panel, reverse the above steps.

## Removing the Front Bezel

1. Turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet and the network cable from the system.
2. Remove the workstation access panel.
3. Push in on the two release tabs **1**, then rotate the front bezel away from the chassis to release it **2**.

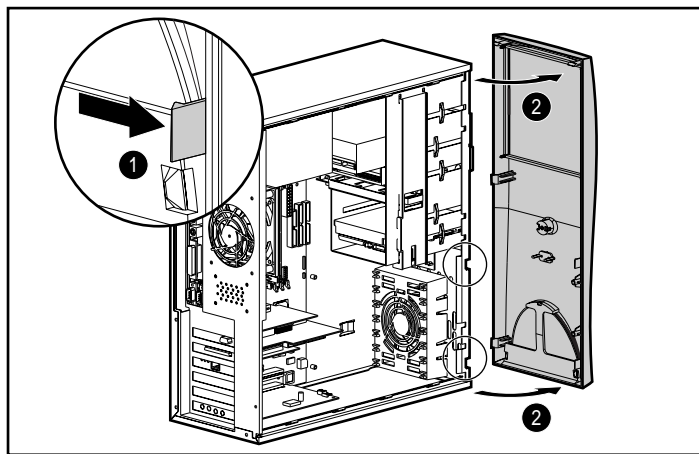


Figure 4-2. Removing the front bezel

**NOTE:** When replacing the front bezel, ensure that the bottom hinge points are properly placed in the chassis before rotating the front bezel back into its original position.

## Removing the Bezel Blank

1. Turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet and the network cable from the system.
2. Remove the workstation access panel.
3. Remove the front bezel.
4. Gently pull the subpanel, with the bezel blank secured in it, away from the front bezel. Remove the bezel blank.



**CAUTION:** Hold the subpanel straight when you pull it away from the front bezel. Pulling the subpanel away at an angle could damage the pins that align it within the front bezel.

---

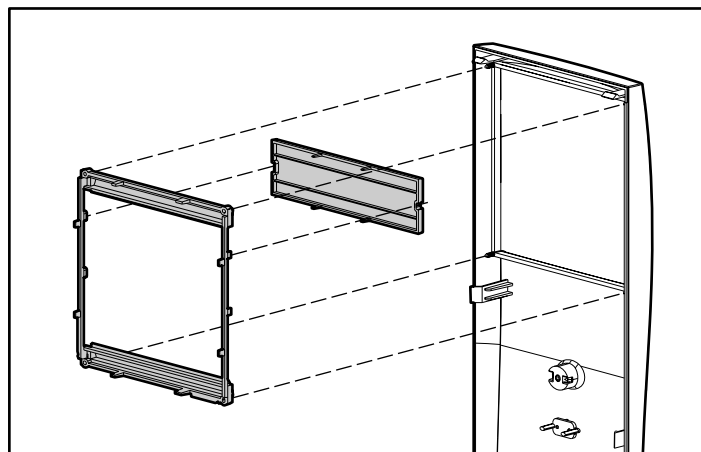


Figure 4-3. Removing the bezel blank from the subpanel

**NOTE:** When replacing the subpanel, ensure that the aligning pins are in their proper orientation.

## Changing from a Minitower to a Desktop Configuration

1. Turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet. Disconnect the network cable and any external devices from the system.
2. Remove the workstation access panel.
3. Remove the front bezel.
4. Disconnect all power and data cables from the drives in the 5.25-inch drive bays.
5. To release the drives from the 5.25-inch drive bay, press the long drivelock as shown.

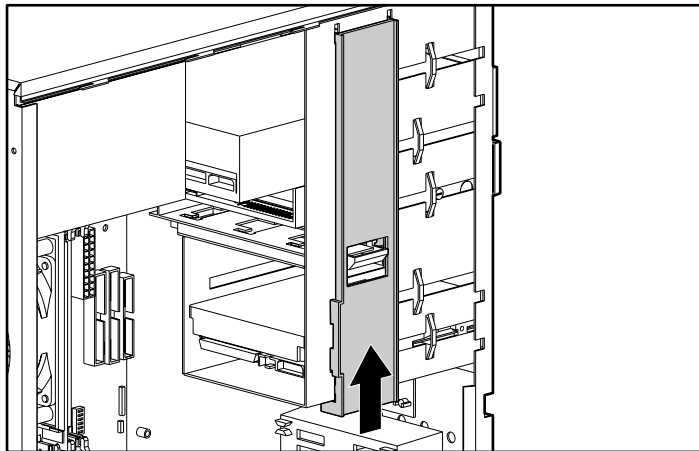


Figure 4-4. Releasing the drives with the drivelock

6. While pressing the drivelock, pull the drives out of the drive bay.



7. After placing the workstation in the desktop position, gently slide the drives back into the bay.

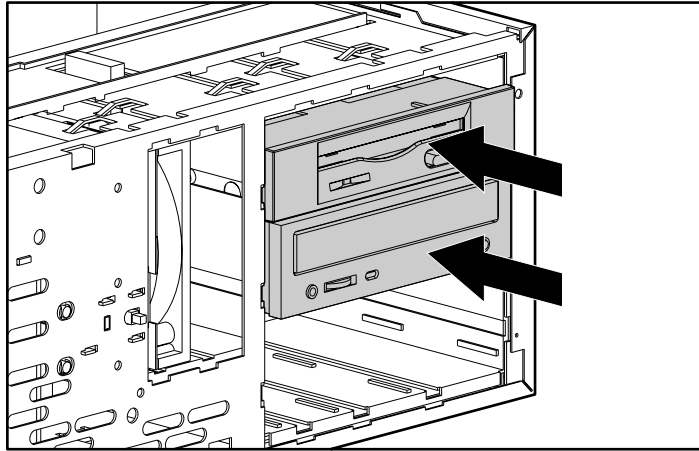


Figure 4-5. Installing the drives

**NOTE:** When the drives are properly inserted, the drivelock will secure them.

**NOTE:** The diskette drive should always be placed in the bay nearest the top of the chassis in the desktop configuration to ensure proper drive clearance and access.



**CAUTION:** The use of unnecessary force may result in damage to the drives.

---

8. Reconnect the power and data cables to the drives as labeled.

#### 4-10 Hardware Upgrades

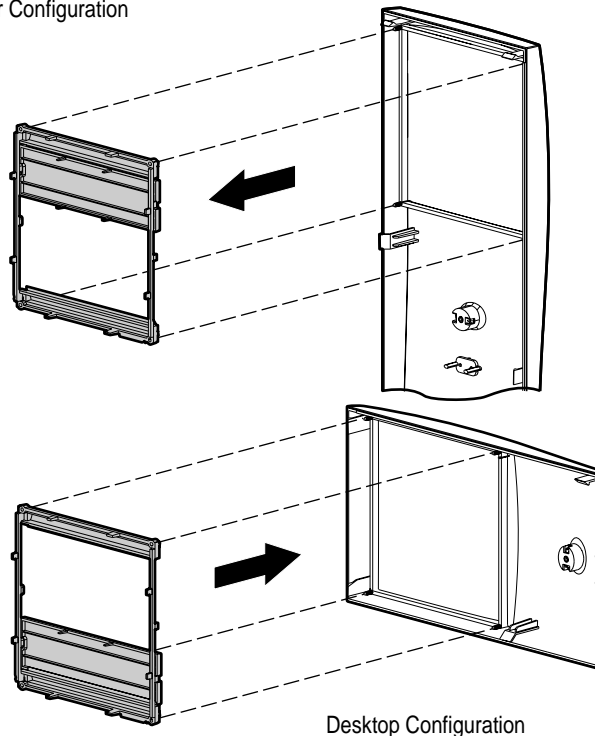
9. Remove the subpanel as described in the section “Removing the Bezel Blank” and reposition it with the bezel blank in the proper orientation for the desktop configuration.



**CAUTION:** Hold the subpanel straight when you pull it away from the front bezel. Pulling the subpanel away at an angle could damage the pins that align it within the front bezel.

---

Minitower Configuration



Desktop Configuration

Figure 4-6. Changing from a minitower to a desktop configuration

10. Replace the subpanel, front bezel, and the workstation access panel.

---

**IMPORTANT:** Be sure the subpanel and front bezel align properly with alignment tabs.

---

11. Reconnect the power cord to the grounded AC outlet, and the network cable, then any external devices to the system.

## Changing from a Desktop to a Minitower Configuration

1. Turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet. Disconnect the network cable and any external devices from the system.
2. Remove the workstation access panel.
3. Remove the front bezel.
4. Disconnect all power and data cables from the drives in the 5.25-inch drive bays.
5. To release the drives from the 5.25-inch drive bay, press the drivelock as shown.

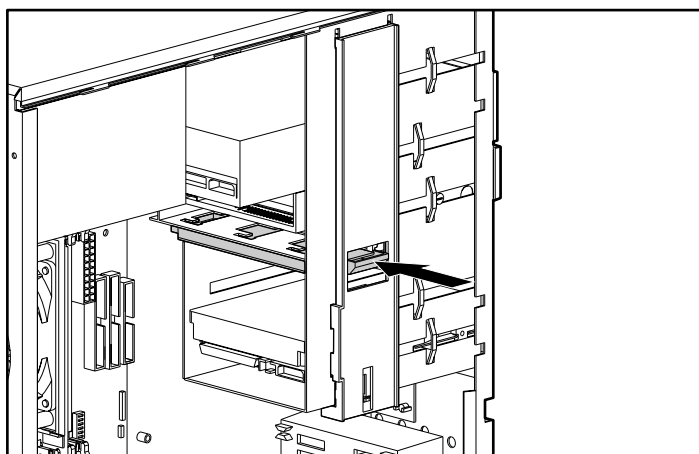


Figure 4-7. Releasing the drives with the drivelock

6. While pressing the drivelock, pull the drives out of the drive bay.

## 4-12 Hardware Upgrades

7. After placing the workstation in the minitower position, gently slide the drives back into the bay.

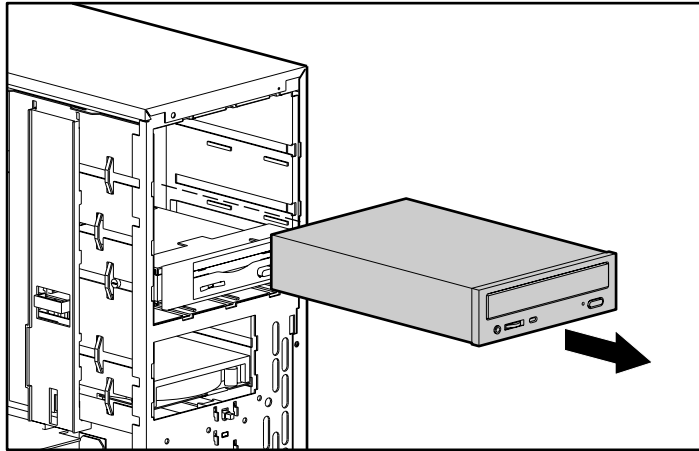


Figure 4-8. Installing the drives

**NOTE:** When the drives are properly inserted, the drivelock will secure them.

**NOTE:** The diskette drive should always be placed in the bay nearest the internal 3.5-inch drives in the minitower configuration for proper clearance within the chassis.



**CAUTION:** The use of unnecessary force may result in damage to the drives.

---

8. Reconnect the power and data cables to the drives as labeled.
9. Remove the subpanel as described in the section “Removing the Bezel Blank” and reposition it with the bezel blank in the proper orientation for the desktop configuration.



**CAUTION:** Hold the subpanel straight when you pull it away from the front bezel. Pulling the subpanel away at an angle could damage the pins that align it within the front bezel.

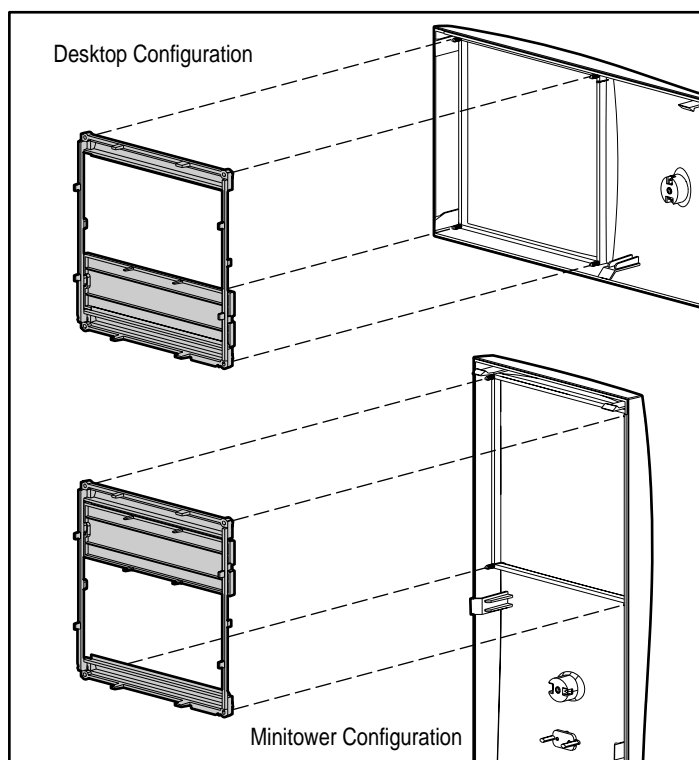


Figure 4-9. Changing from a desktop to a minitower configuration

10. Replace the subpanel, front bezel, and the workstation access panel.

**IMPORTANT:** Be sure the subpanel and front bezel align properly with alignment tabs.

11. Reconnect the power cord to the grounded AC outlet, and the network cable, then any external devices to the system.

## Internal Components

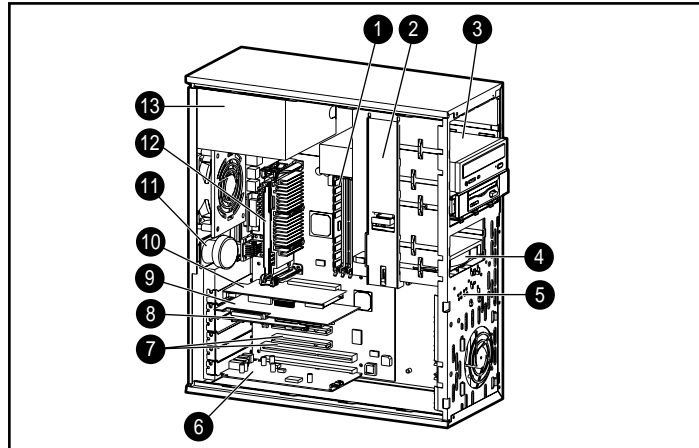


Figure 4-10. Identifying internal components

**Table 4-1**  
**Internal Components**

Identifier	Component
①	Memory module sockets
②	Drivelock
③	Drive bays (diskette drive is always in bay 3)
④	Hard drive bays (bays 4 and 5)
⑤	Extra drive mounting screws
⑥	Audio card in ISA expansion slot
⑦	Combination slot for either a PCI or an ISA expansion board
⑧	NIC controller in PCI slot
⑨	SCSI controller in PCI slot (on select models)

*Continued*

**Internal Components** *Continued*

Identifier	Component
10	AGP slot
11	Speaker
12	Processor (The processor in your workstation may look slightly different than the one pictured.)
13	Power supply

## Installing Additional Memory

The workstation comes with at least 64 MB of Error Checking and Correcting (ECC) unregistered, synchronous dynamic random access memory (SDRAM), dual inline memory modules (DIMMs) installed, and supports up to 768 MB of memory. The memory sockets on the system board can be populated with 16-, 32-, 64-, 128-, or 256-MB DIMMs.

For proper system operation, the DIMMs must be industry standard 168-pin, 100-MHz or faster unbuffered SDRAM DIMMs. The SDRAM DIMMs must support CAS Latency 2 or 3 (CL = 2 or CL = 3). They must also contain the mandatory Joint Electronic Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information. DIMMs constructed with x4 SDRAM are not supported; the system will not start using unsupported DIMMs.

---

**IMPORTANT:** Do not mix registered and unregistered, or ECC and non-ECC SDRAM DIMMs. Otherwise, your system will not function properly. To upgrade to the 768 MB of memory, you must use only 256-MB unregistered ECC SDRAM DIMMs.

---



**CAUTION:** Your DIMM sockets have gold metal contacts. When upgrading your memory, it is important to use DIMMs with gold metal contacts (not tin-lead) to prevent corrosion and/or oxidation resulting from having incompatible metals in contact with each other.

---



**CAUTION:** Static electricity can damage the electronic components of the workstation or optional boards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See “Appendix B” of this guide for more information.

---



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

---

1. Turn off the workstation and any external devices, then disconnect the power cord from the grounded AC outlet. Disconnect the network cable and any external devices from the system.

---

**IMPORTANT:** On a power-managed system, the power cord **must** be disconnected from the grounded AC outlet.

---

2. Remove the workstation access panel and locate the DIMM sockets.
3. Open both latches of the DIMM socket, and insert the memory module into the socket.
4. Begin by installing a module into the socket nearest the preinstalled module, and install the modules following the numerical order of the sockets.



- Match the notch on the module with the tab on the memory socket. Push the module down into the socket, ensuring that the module is fully inserted and properly seated.

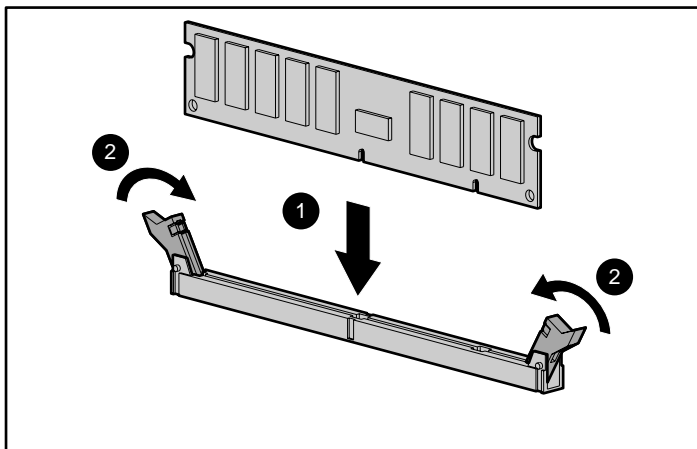


Figure 4-11. Installing a DIMM module

- Replace the workstation access panel.
- Plug the network cable back into the system. Plug the power cord back into the grounded AC outlet. Reconnect external devices.
- Turn on the workstation.

The workstation should automatically recognize the added memory.

## Installing an Expansion Board

Your workstation contains expansion slots, as shown in the “Internal Components” section of this chapter.



**CAUTION:** Static electricity can damage the electronic components of the workstation or optional boards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See “Appendix B” of this guide for more information.

---

1. Turn off the workstation and any external devices, then disconnect the power cord from the grounded AC outlet. Disconnect the network cable and any external devices from the system.

**NOTE:** You would install the Accelerated Graphics Port (AGP) graphics controller the same way you would install another expansion board. You must use an AGP board with an ATX form factor bracket.

---

**IMPORTANT:** On a power-managed system, the power cord **must** be disconnected from the grounded AC outlet.

---

2. Remove the workstation access panel and locate the correct vacant slot in the workstation chassis.

3. Remove the screw securing the expansion slot cover, then remove the slot cover from the slot, as illustrated.

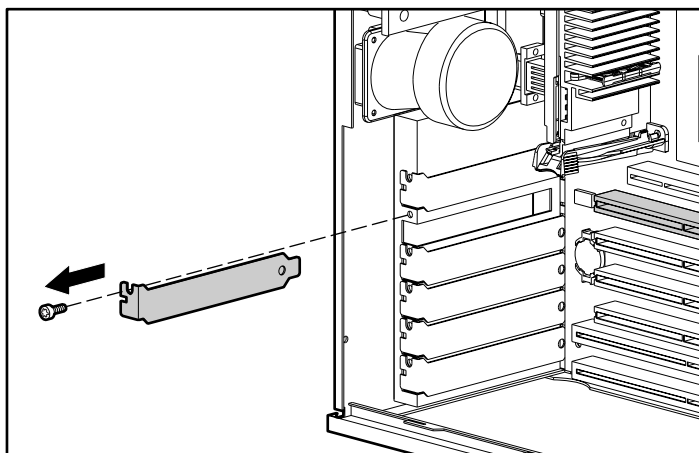


Figure 4-12. Removing the screw and expansion slot cover

#### 4-20 Hardware Upgrades

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

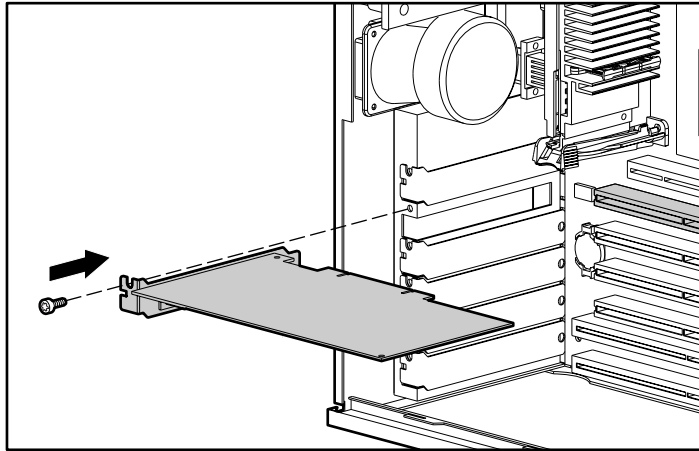


Figure 4-13. Installing an expansion board

The processor in your workstation may look slightly different than the one pictured.

**NOTE:** When you install an expansion board, make sure you press firmly on the board so that the whole connector seats properly in the expansion board slot

5. Replace the screw at the side of the expansion slot.
6. Replace the workstation access panel.
7. Connect external cables to the installed board, if needed.
8. Plug the network cable back into the system. Plug the power cord back into the grounded AC outlet. Reconnect external devices.
9. Reconfigure the workstation, if necessary. See the “When to Reconfigure the Workstation” section in this chapter.

## Removing an Expansion Board

1. Turn off the workstation and any external devices, then disconnect the power cord from the grounded AC outlet. Disconnect the network cable and any external devices from the system.

**NOTE:** You would remove the Accelerated Graphics Port (AGP) graphics controller the same way you would remove another expansion board.

---

**IMPORTANT:** On a power-managed system, the power cord **must** be disconnected from the grounded AC outlet.

---

2. Remove the workstation access panel.
3. Disconnect any cables attached to the expansion board.
4. Remove the screw at the side of the expansion slot.
5. 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.

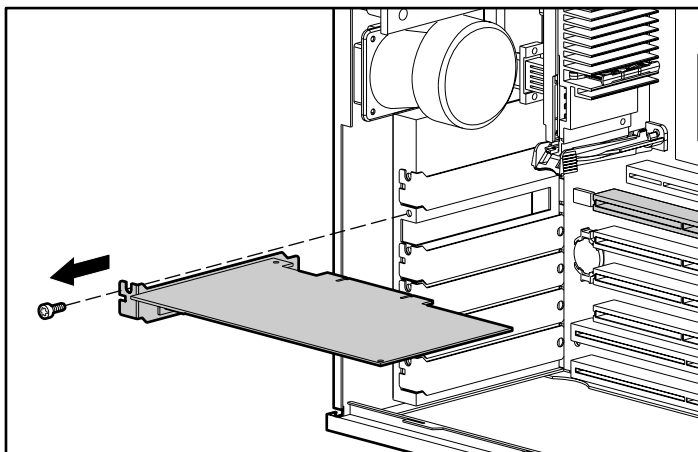


Figure 4-14. Removing an expansion board

The processor in your workstation may look slightly different than the one pictured.

6. Store the board in antistatic packaging.

#### **4-22** *Hardware Upgrades*

7. Install an expansion slot cover to close the open slot.
8. Replace the workstation access panel.
9. Plug the network cable back into the system. Plug the power cord back into the grounded AC outlet and reconnect external devices.
10. Reconfigure the workstation, if necessary. See the “When to Reconfigure the Workstation” section in this chapter.

## Installing Additional Drives

The workstation supports up to five drives that can be installed in various configurations.

When installing additional IDE drives, follow these guidelines:

- For optimal performance, connect hard drives to the primary controller. Connect expansion devices, such as IDE CD-ROM, tape, and diskette drives to the secondary controller.
- You may install either a third-height or a half-height drive into a half-height bay.
- You must install guide screws to ensure that 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. Some options use M3 metric hardware. Compaq-supplied metric screws are black.

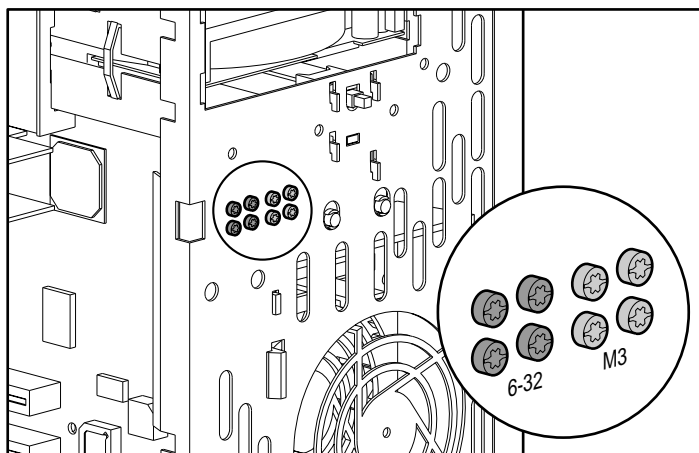


Figure 4-15. Identifying the metric screws

## Using the Cable-Select Feature with IDE Ultra ATA Devices

Select models of the Compaq Professional Workstation AP200 have an internal IDE Ultra ATA hard drive preinstalled. Optional IDE drives are available from Compaq in kits that include a special drive cable. The configuration of the drives employs a cable-select feature that identifies the drives as device 0 (primary drive) or device 1 (secondary drive). The system board determines which drive is device 0 or device 1, based on the way the drives are connected to the special drive cable. The device 0 drive is the drive connected to the short segment of the drive cable (or the connector closest to the system board); the device 1 drive is the drive connected to the long segment of the drive cable.

Drive installation requires no jumper setting changes on the existing or optional drives. All Compaq drives have the jumpers preset for cable-select installation.

**NOTE:** If you are installing a second IDE device on the primary controller, you must use an 80-conductor IDE Ultra ATA cable for optimal performance. This cable is included with the drive option kit.

---

**IMPORTANT:** Compaq does not support mixing IDE Ultra ATA and SCSI hard drives in the same system. If you are replacing a hard drive in bay 4 or 5, it must be of the same type. If you are replacing the IDE Ultra ATA hard drive in your workstation with a SCSI hard drive, you will need a SCSI device option kit and the SCSI controller option kit. The controller option kit contains the SCSI controller and cable that supports multiple SCSI devices. See the section "Installing a SCSI Device" in this chapter.

---



## Installing Optional SCSI Devices

Select models of the Compaq Professional Workstation AP200 have an internal SCSI hard drive preinstalled. 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 7 SCSI devices per SCSI controller.
- The integrated Wide-Ultra SCSI controller requires that a unique SCSI ID (0-7) be set for each SCSI device installed. The controller identifies 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.
  - SCSI IDs 1 through 6 are available.
- Every SCSI chain or circuit must be terminated (closed) at both ends. If using a terminated cable, disable the termination for all devices. If using a non-terminated cable, only disable the termination for the last device on the chain.

- 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. 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 air intake to the power supply. Cables routed in this manner can block airflow to the power supply, causing it to overheat.

---

### Using the SCSI Cable

The following SCSI cable is included with your workstation (available on select models):

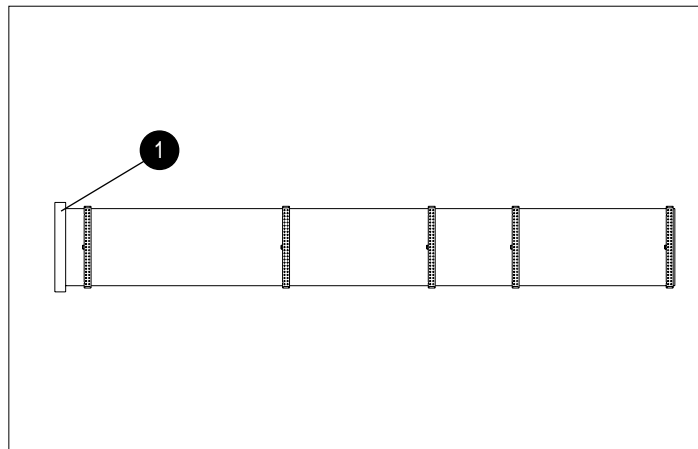


Figure 4-16. Identifying the SCSI cable with terminator

**NOTE:** The SCSI cable included with your workstation may look slightly different than the one pictured.

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 SCSI adapter to it.

For additional information about installing optional SCSI devices, refer to the documentation included with the device option kit or contact your Compaq Authorized Dealer, Reseller, or Service Provider.

## Installing a SCSI Device

---

**IMPORTANT:** Compaq does not support mixing IDE Ultra ATA and SCSI hard drives in the same system. If you are replacing a hard drive in bay 4 or 5, it must be of the same type. If you are replacing the IDE Ultra ATA hard drive in your workstation with a SCSI hard drive, you will need a SCSI device option kit and the SCSI controller option kit. The controller option kit contains the SCSI controller and cable that supports multiple SCSI devices.

---

Before you install a SCSI device:

- Verify the SCSI ID of the drive and, if necessary, set the SCSI ID to a unique 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” in this chapter or refer to the documentation included with the device.
- To install a SCSI device, please follow the procedures in the following section, “Installing an IDE CD-ROM or Tape Drive.” Also refer to the documentation that came with the SCSI device option kit.

## Installing an IDE CD-ROM or Tape Drive



**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. See Appendix B for more information.

---

**NOTE:** These procedures can also be used for installing a SCSI device. For more information, refer to the documentation that came with the SCSI device option kit.

1. Turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet. Disconnect the network cable and any external devices from the system. remove the workstation access panel.

---

**IMPORTANT:** On a power-managed system, the power cord **must** be disconnected from the grounded AC outlet.

---

2. Install two guide screws on each side of the drive. If there are multiple screw holes on the sides of the drives, use the lower set of holes.

**NOTE:** Some options use M3 metric hardware, such as in the 5.25-inch, one-half height external bay. Extra guide screws are provided on the front of the chassis, under the front bezel. Compaq-supplied metric screws are black.

3. Install the drive in the desired drive bay by sliding it into the front of the drive cage; the drivelock automatically secures the drive in the bay.

**NOTE:** Be sure the guide screws line up with the guide slots in the drive cage.

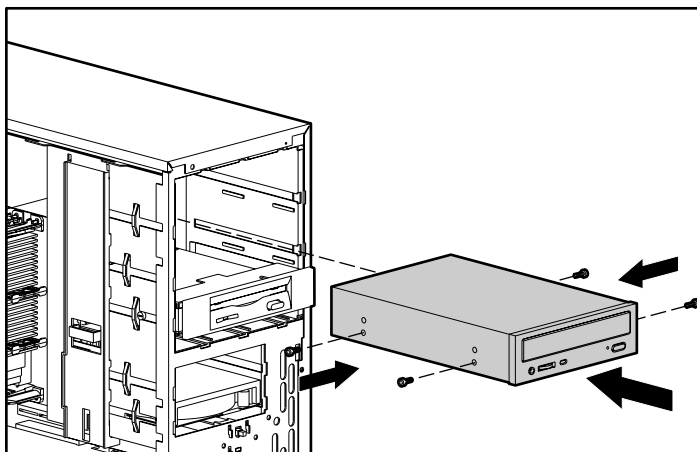


Figure 4-17. Aligning the guide screws and installing an optional 5.25-inch drive

4. Connect the drive power and signal cables and, if it is a CD-ROM drive, connect the audio cable. The other end of the audio cable should be connected to the optional audio board, if installed.

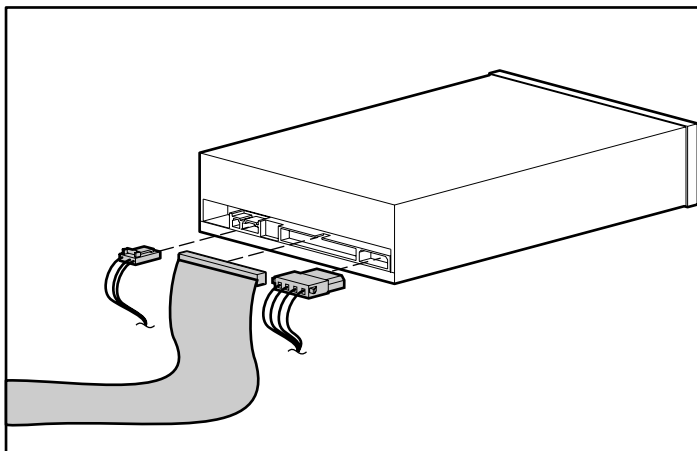


Figure 4-18. Connecting the drive cables to the drive

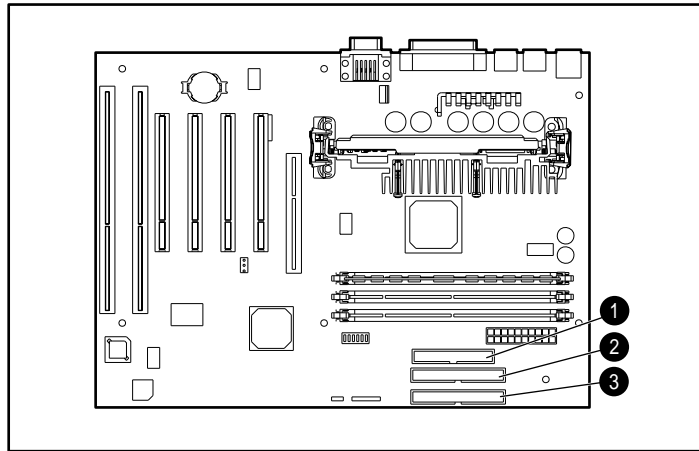


Figure 4-19. Connecting the drive cables to the system board

**Table 4-2**  
**Drive Cables**

Identifier	Component
❶	IDE diskette drive connector
❷	IDE Ultra ATA hard drive connector
❸	IDE CD-ROM connector

5. Remove the bezel blank from the subpanel inside the front bezel. See the section “Removing the Bezel Blank.”
6. Replace the workstation access panel.
7. Plug the network cable back into the system. Plug the power cord back into the grounded AC outlet. Reconnect external devices.
8. Reconfigure the workstation, if necessary. See the “When to Reconfigure the Workstation” section in this chapter.

## Installing a 3.5-Inch Drive into the Third-height, 5.25-Inch Drive Bay

1. Turn off the workstation and any external drives. Disconnect the power cord from the grounded AC outlet. Disconnect the network cable and any external devices from the system. Then remove the workstation access panel.

---

**IMPORTANT:** On a power-managed system, the power cord **must** be disconnected from the grounded AC outlet.

---

2. Install one guide screw on the right side of the drive ②.
3. Insert the drive into the adapter ① so that the guide screw aligns in the slot ②, then attach with the two retaining screws.
4. Snap on the brace ④.
5. Insert the brace into the adapter side tray slots ④.

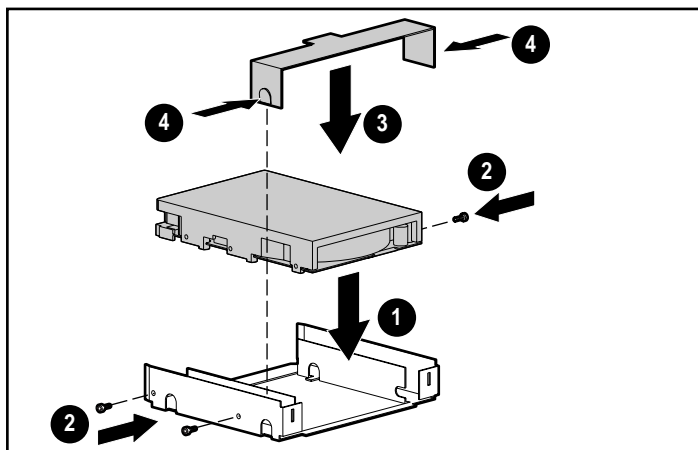


Figure 4-20. Attaching a 3.5-inch drive to the 5.25-inch adapter

## 4-32 Hardware Upgrades

6. Install two guide screws on each side of the adapter ❶.
7. Install the adapter in the desired drive bay by sliding it into the front of the drive cage ❷; the drivelock automatically secures the adapter when it snaps into place.

**NOTE:** The primary 3.5-inch diskette drive should only be installed into bay 3. Bay 3 is the bottom bay in the minitower configuration and the topmost bay in the desktop configuration.

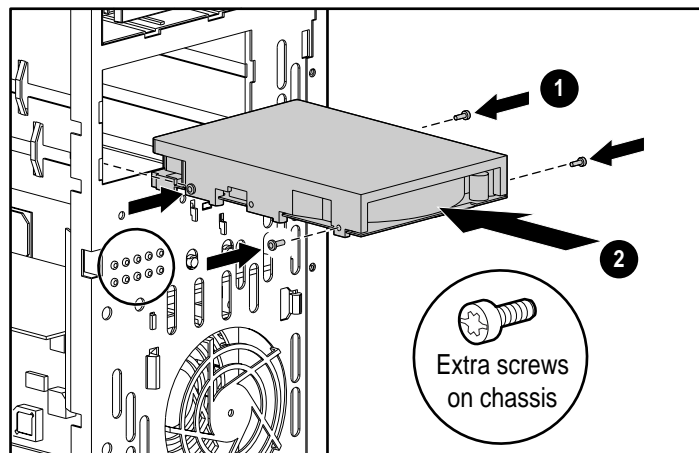


Figure 4-21. Aligning the guide screws and installing a 3.5-inch drive



8. Connect the drive power and signal cables.

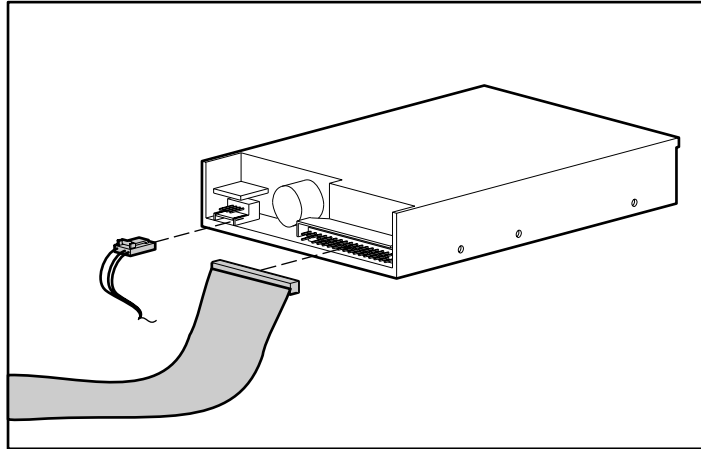


Figure 4-22. Connecting the drive cables to the drive

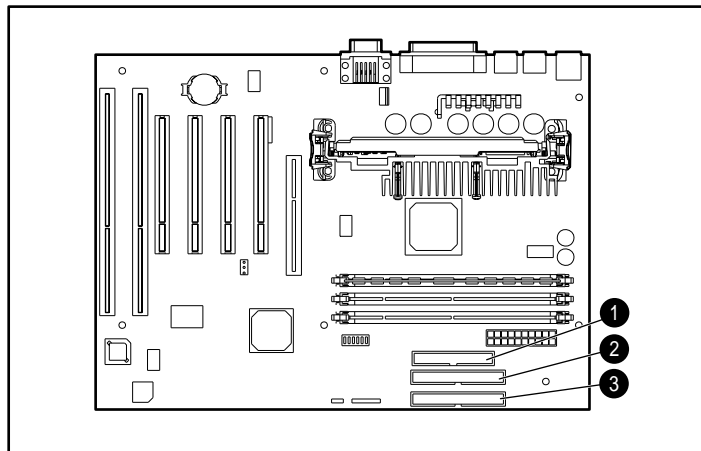


Figure 4-23. Connecting the drive cables to the system board

**Table 4-3**  
**Drive Cables**

Identifier	Component
❶	IDE diskette drive connector
❷	IDE Ultra ATA hard drive connector
❸	IDE CD-ROM connector

9. If necessary, remove the bezel blank from the subpanel inside the front bezel. See the section “Removing the Bezel Blank.”
10. Replace the workstation access panel.
11. Plug the network cable back into the system. Plug the power cord back into the grounded AC outlet. Reconnect external devices.
12. Reconfigure the workstation, if necessary. See the “When to Reconfigure the Workstation” section in this chapter.

## Removing a Drive from a Drive Bay

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**IMPORTANT:** Compaq does not support mixing IDE ATA and SCSI hard drives in the same system. If you are replacing a hard drive in bay 4 or 5, it must be of the same type.

---

1. Turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet. Disconnect the network cable and any external devices from the system. Remove the workstation access panel.

---

**IMPORTANT:** On a power-managed system, the power cord **must** be disconnected from the grounded AC outlet.

---

2. Remove the front bezel.
  3. Disconnect the drive power and signal cables and, if it is a CD-ROM drive, disconnect the audio connector.
  4. Press the drivelock to unlock the drive in the drive bay.
-

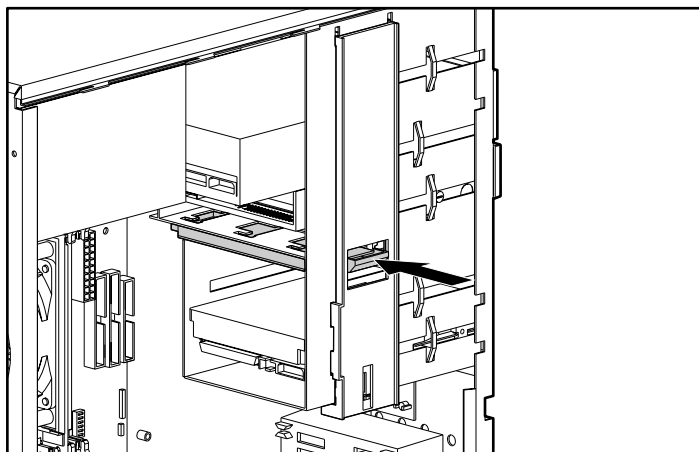


Figure 4-24. Releasing the drives with the drivelock

5. While pressing the drivelock, pull the drive out of the drive bay.

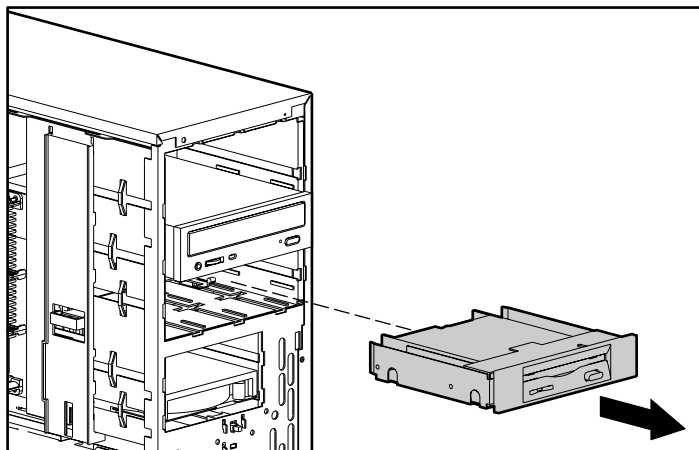


Figure 4-25. Removing a drive from the 5.25-inch drive bay

6. Store in antistatic packaging.

## Replacing the Battery

The battery that comes with your workstation provides power to the real-time clock and has a lifetime of about five years. When replacing the battery, use a Renata CR2032 or equivalent 3-volt lithium coin cell battery.

1. Turn off the workstation and any external devices. Disconnect the power cord from the grounded AC outlet. Disconnect the network cable and any external devices from the system. Remove the workstation access panel.

---

**IMPORTANT:** On a power-managed system, the power cord **must** be disconnected from the grounded AC outlet.

---

**NOTE:** It may be necessary to remove an expansion board to gain access to the battery.

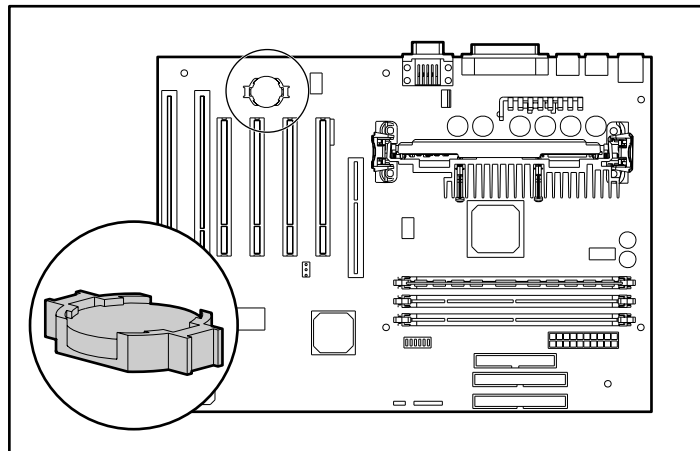


Figure 4-26. Locating the battery on the system board

- Lift the battery out of its holder.

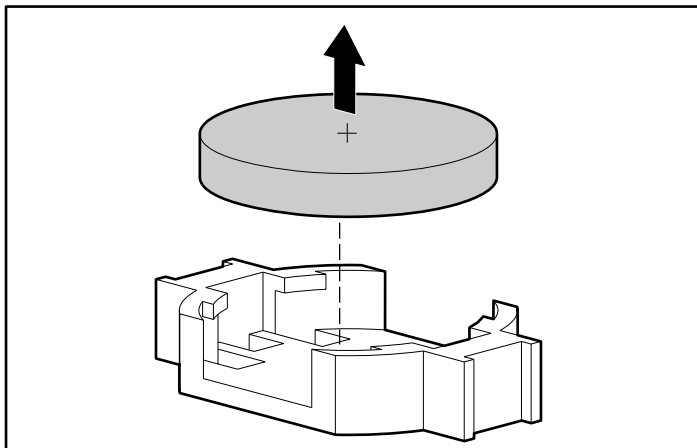


Figure 4-27. Removing the coin cell battery

- Slide the replacement battery into position.

**NOTE:** Positive polarity should be positioned up.

- The battery holder automatically secures the battery in the proper position.
- Replace any expansion boards you have removed.
- Replace the workstation access panel.
- Plug the network cable back into the system. Plug the power cord back into the grounded AC outlet and reconnect external devices.
- Plug in the workstation and turn on the power.

Reset the date and time, your passwords, and any special system setups using Compaq Computer Setup. See Chapter 2, "Software."

## 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.

**NOTE:** For more information on networking, refer to the *Software Installation Guide*.

Your workstation comes Ethernet network ready, which means that it has a preinstalled network controller and preinstalled network drivers. The Compaq NC3121 Fast Ethernet Network Interface Controller (10/100 Mb/s Auto-sensing Ethernet controller) PCI card with Wake-on-LAN is a PCI bus mastering, dual speed 10BaseT, and 100BaseTX controller that will automatically detect network connection speed and adjust accordingly.

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

## Connecting to an Ethernet Network

An RJ-45 Ethernet network connector is included on your workstation.

### Attaching a Network Cable to the RJ-45 Connector

Refer to the following illustration to connect a network cable to the RJ-45 connector.

---

**IMPORTANT:** If you are connecting to a 100BaseTX network, you must use a Category 5 UTP cable. Also, for Remote Wakeup and Remote Shutdown to function, the internal power cable for the network interface controller must be connected to the system board. See the section "Remote Wakeup and Remote Shutdown" in Chapter 3 for information on these features.

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**WARNING:** To reduce the risk of personal injury from electrical shock, remove all power cords to completely disconnect power from the system before attaching the network cable to the RJ-45 connector.

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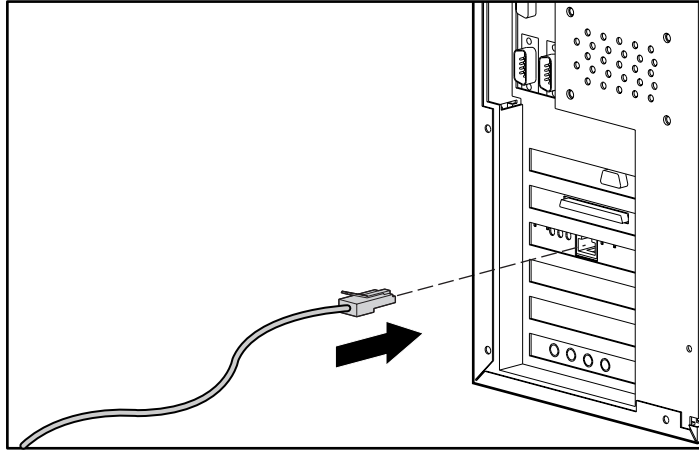


Figure 5-1. Attaching the network cable to the RJ-45 connector



**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.

## Installing the Network Driver

The network device driver enables the workstation to communicate with the network. The network driver is preinstalled on your workstation. For information about installing drivers, operating systems, and other support software, refer to the *Software Installation Guide*.



## Chapter 6

# Troubleshooting

This guide provides information on how to identify and correct some common disk, display, memory, and software problems. It also identifies and explains some common messages you may receive on the screen, including specific error messages that may display during the Power-On Self-Test (POST) at startup.

You will not see these POST error messages if your workstation is configured for the Clean Boot mode.

Clean Boot is a fast boot process that suppresses most system messages during POST, such as memory count and non-error text messages. If a POST error occurs, the screen will display the error message. To manually switch to Descriptive mode during POST, press any key (except F10 or F12). The default boot mode is Clean Boot.

Descriptive Boot shows all system messages during POST and takes longer to complete. To see the system messages every time you restart your workstation, reconfigure your workstation to the Descriptive Boot mode using Computer Setup.

**NOTE:** For more information on Computer Setup, see Chapter 2, "Software."

## Helpful Hints

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

- Verify that the workstation and monitor are plugged into a working grounded AC outlet.
- Verify that the workstation is turned on and the green power light is on.
- Verify 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, your keyboard should be operating correctly.
- Check all cable connections for loose or incorrect connections.
- If necessary, reconfigure your workstation after installing an expansion board or other option, such as a diskette drive. See the section "When to Reconfigure the Workstation" in Chapter 4 for instructions. Also, see the section "Solving Hardware Installation Problems" in this chapter for more information.
- Verify that all switch settings have been set correctly.
- Be sure all the needed device drivers have been installed (for example, if you are using a printer, you need a printer driver).
- Take out all diskettes from the diskette drives before you turn on your system.

## Solving Minor Problems

You may be able to easily resolve the minor problems described in this section. If a problem persists and you are unable to resolve it yourself, contact your Compaq Authorized Dealer or Reseller. See the “Getting Help” section in the front of this guide for a list of Compaq worldwide technical support telephone numbers.

**Table 6-1**  
**Solving Minor Problems**

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Workstation won't 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.	Verify that cables connecting the workstation and the external power source are plugged in properly.
	A defective PCI or ISA card has been installed.	Remove any adapter card that was just installed.
Workstation appears locked up and won't turn off when the power button is pressed.	Software control of the power switch is not functional.	Press and hold the power button for four seconds, then release. This action invokes the hardware override for the power button.
Workstation date and time display is incorrect.	RTC (real-time clock) battery may need to be replaced. Battery life is approximately 5 years.	First, reset the date and time under Control Panel. If the problem persists, replace the RTC battery. See Chapter 4, “Hardware Upgrades,” for instructions on installing a new battery, or contact your Compaq Authorized Dealer or Reseller for RTC battery replacement.

*Continued*

## 6-4 Troubleshooting

### Solving Minor Problems *Continued*

Problem	Cause	Solution
Workstation powered-off automatically.	The unit temperature was exceeded. The fan may be blocked.	Unit is in an exceedingly hot environment. Let it cool down. Contact your Compaq Authorized Reseller or Service Provider.
	The unit temperature was exceeded because the workstation was functioning with the cover or side panel removed.	Replace cover or side panel and let the workstation cool down before attempting to turn on power to the workstation.
Workstation appears to pause periodically.	Network driver is loaded and no network connection is established.	Establish a network connection or use Computer Setup to disable the network controller.

## Solving Disk Problems

Common causes and solutions for disk problems are listed in the following table.

**NOTE:** You may need to reconfigure the workstation when you add or remove hardware, such as an additional diskette drive. See "Solving Hardware Installation Problems" for instructions.

**Table 6-2**  
**Solving Disk Problems**

Problem	Cause	Solution
Diskette drive light stays on.	Diskette is damaged.	In Windows NT Workstation 4.0, run Scan Disk. Click <i>Start</i> ; then select <i>Programs, DiskTools, ScanDisk</i> .
	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.
	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.
A problem has occurred with a disk transaction.	The directory structure is bad, or there is a problem with a file.	Run Scan Disk. Click <i>Start</i> , then select <i>Programs, Accessories, System Tools</i> .

*Continued*

## 6-6 Troubleshooting

### Solving Disk Problems *Continued*

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
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 is not found.	Cable is loose.	Check connections.
Second IDE Ultra ATA hard drive does not perform optimally.	Workstation configuration does not recognize second diskette drive.	Use Computer Setup to enable the second diskette drive. Select Diskettes from the Storage menu.
	You are using the wrong cable for the drive type.	Reinstall the second IDE Ultra ATA hard drive using an 80-conductor cable. This cable comes in the drive option kit.
Nonsystem disk message displays.	The system is trying to start from a nonsystem diskette.	Remove the diskette from the drive.

## Solving SCSI Problems

If you encounter SCSI device problems, refer to the common causes and solutions listed in the following table.

**Table 6-3**  
**Solving SCSI Problems**

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
System with IDE and SCSI drives will not boot from SCSI hard drive.	The IDE drive is not disabled through the Configuration utility.  Compaq does not support mixing IDE Ultra ATA and SCSI hard drives in the same system.	Under the Computer Setup Advanced menu, disable the primary IDE controller.
System will not boot from a SCSI drive.	The SCSI drive is not configured correctly.	Verify that drive cabling and jumpers are set correctly. To boot a SCSI drive, the drive ID number must be set to 0.

## Solving Display Problems

If you encounter display problems, refer to the documentation that came with your monitor and to the common causes and solutions listed in the following table.

**Table 6-4**  
**Solving Display Problems**

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Screen is blank.	Monitor is not turned on and the monitor light is not on.	Turn on the monitor and verify 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 grounded AC outlet.
	The energy saver feature has been enabled.	Press any key or click the mouse button and, if it is set, type your password.
	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.
	System ROM is bad; system is running in Failsafe Boot Block mode (indicated by one long beep and three short beeps).	Reflash the ROM using a ROMPaq diskette. See the "Failsafe Boot Block ROM" section of Chapter 3 for more information.

*Continued*



**Solving Display Problems** *Continued*

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Screen is blank. (Continued)	You are using a fixed-sync monitor and it won't sync at the resolution chosen.	Be sure that the monitor can accept the same sweep rate as the resolution chosen.
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.
Video colors are wrong.	This indicates that either the cabling or monitor impedance is incorrect.	<ol style="list-style-type: none"> <li>1. If you are using BNC cables, be sure that the Red, Green, and Blue BNC cables are connected to the corresponding monitor connectors.</li> <li>2. Be sure your monitor's RGB inputs are set to 75 ohms.</li> </ol>
Characters are dim.	<p>The brightness and contrast controls are not set properly.</p> <p>Cables are not properly connected.</p> <p>The RGB switch on the back of the monitor is incorrectly set.</p>	<p>Adjust the monitor brightness and contrast controls.</p> <p>Verify that the video cable is securely connected to the video card and the monitor.</p> <p>Set the RGB switch (and sync options, if this option is available) to 75 ohms, with the sync set to "External." Refer to the documentation included with the monitor.</p>

*Continued*

**6-10** *Troubleshooting*

**Solving Display Problems** *Continued*

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
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 on the diskette included in the upgrade kit.
Screen goes blank.	You may have a screen blanking utility installed or energy-saver features are enabled.	Press any key or type in your password.
The picture is broken up, or it rolls, jitters, or blinks.	The monitor connections may be incomplete or the monitor may be incorrectly adjusted.	<ol style="list-style-type: none"><li>1. Be sure the monitor cable is securely connected to the workstation.</li><li>2. In a 2-monitor system or if another monitor is in close proximity, move them apart to be sure they are not interfering with each other's electromagnetic field.</li></ol>
Monitor overheats.	There is not enough ventilation space for proper airflow.	Leave at least 3 inches (7.6 cm) of ventilation space. Be sure there is nothing sitting on top of the monitor obstructing the air flow.

*Continued*

**Solving Display Problems** *Continued*

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Cursor will not move using the arrow keys on the keypad.	The <b>Num Lock</b> key may be on.	Press the <b>Num Lock</b> key. The light should not be on if you want to use the arrow keys.
Sound does not come out of the speaker.	Software volume control is turned down in Microsoft Sound System Control Panel, or CD-ROM volume control on the front or back of the workstation is turned down.	Click <i>Start</i> , then select <i>Programs, Accessories, Multimedia, Volume Control</i> .  Turn the CD-ROM volume control knob on front or back of workstation to increase the volume.

## Solving Printer Problems

If you encounter printer problems, refer to the documentation that came with your printer and to the common causes and solutions listed in the following table.

**Table 6-5**  
**Solving Printer Problems**

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Printer will not print.	Printer is not turned on nor on-line.	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 grounded AC outlet.
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.	Check the paper tray and refill it if it is empty. Select online.

## Solving Hardware Installation Problems

You may need to reconfigure the workstation when you add or remove hardware, such as an additional diskette drive. To reconfigure the workstation in Windows NT Workstation 4.0 after installing new hardware, run the Computer Setup utility. See Chapter 2, "Software," for more information on Computer Setup.

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**Table 6-6**  
**Solving Hardware Installation Problems**

Problem	Cause	Solution
A new device is not recognized as part of the workstation system.	The workstation needs to be reconfigured to recognize the device.	Follow the reconfiguration instructions.
	Cable(s) of new external device are loose or power cables are unplugged.	Verify 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 workstation system.

---

## Solving Network Problems

Some common causes and solutions for network problems are listed in the following table. These guidelines do not discuss the process of debugging the network cabling.

**Table 6-7**  
**Solving Network Problems**

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Remote Wakeup feature is not functioning.	The Remote Wakeup feature is not available when using an AUI network connection.	Use an RJ-45 network connection.
	The 3-pin WOL header may not be connected properly.	Assure connected properly (refer to the Hood Label on your workstation for the location of the 3-pin WOL header).
Network driver does not detect network controller.	Network controller is disabled.	Run Computer Setup and enable network controller.
Network status link light does not turn on, or it flashes.	No active network is detected.	Check cabling and network equipment for proper connection.
	Network controller is not set up properly.	Use the Network control application to verify that device is working properly. See Chapter 3, "Intelligent Manageability."
	System is configured for AUI connection.	No solution; link LED does not apply to AUI connections.

*Continued*

**Solving Network Problems** *Continued*

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Network status link light does not turn on, or it flashes (Continued).	Network driver is not properly loaded.	Reinstall network driver using the Compaq SmartStart for Workstations CD.
	System cannot autosense the network.	Disable autosensing capabilities and force the system into the correct operating mode. See Chapter 3, "Intelligent Manageability."
Diagnostics reports a failure.	The cable is not securely connected.	Verify 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.	Verify that the cable is attached to the correct connector.
	There is a problem with the cable or a device at the other end of the cable.	Verify that the cable and device at the other end are operating correctly.
	The network controller is defective.	Contact your Compaq Authorized Service Provider.
Diagnostics passes, but the workstation does not communicate with the network.	Network controller interrupt with an expansion board.	Under the Computer Setup Advanced menu, change the resource settings for the board.

*Continued*

**6-16** *Troubleshooting*

**Solving Network Problems** *Continued*

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Diagnostics passes, but the workstation does not communicate with the network. <i>(Continued)</i> .	Network driver is not loaded, or driver parameters do not match current configuration.	Make sure the network driver is loaded and that the driver parameters match the configuration of the network controller.
	The network controller is not configured for this workstation.	Select the Network icon at the Control Panel.
Network controller stopped working when an expansion board was added to the workstation.	Network controller interrupt with an expansion board	Under the Computer Setup Advanced menu, change the resource settings for the board.
	The network controller requires a driver.	Verify that the driver was not accidentally deleted when the drivers for a new expansion board were installed.
	The files containing the network driver are corrupted.	Reinstall the network driver using the Compaq SmartStart for Workstations CD.
Network controller stopped working without apparent cause.	The files containing the network driver are corrupted.	Reinstall the network driver using the Compaq SmartStart for Workstations CD.
	The cable is not securely connected.	Verify 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.

*Continued*



**Solving Network Problems** *Continued*

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Network controller stopped working without apparent cause <i>(Continued).</i>	The network controller is defective.	Contact your Compaq Authorized Service Provider.
Cannot connect to network server when attempting Remote System Installation	The network controller is not configured properly.	Run Computer Setup and modify the embedded NIC settings.
	A Remote Management System installation Server is not available.	Be sure the Remote Management System Installation Server is configured properly.

## Solving Memory Problems

If you encounter memory problems, some common causes and solutions are listed in the following table.

**Table 6-8**  
**Solving Memory Problems**

Problem	Cause	Solution
System won't boot or does not function properly after installing additional memory modules.	Memory module is not the correct type or speed grade for the system.	Replace the memory module with an industry-standard, ECC, unregistered, 168-pin synchronous dynamic random access memory (SDRAM) DIMM that meets the following criteria: <ul style="list-style-type: none"> <li>■ System Bus</li> <li>■ 100 MHz</li> </ul> Rated for 100 MHz or faster operation Has an access time (CLK to Q) of 6nS or less Supports CAS latency 2 or 3 operation

*Continued*

**Solving Memory Problems** *Continued*

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Out of Memory error	Memory configuration may not be set up correctly.	From the Control Panel icon, select the System Performance tab and increase virtual memory.
	You have run out of memory to run the application.	Check the application documentation to determine the memory requirements.
Memory count during POST is wrong.	The memory modules may not be installed correctly.	Verify that the memory modules have been installed correctly and that only SDRAM DIMM modules are used.
Insufficient memory error during operation	Too many Terminate and Stay Resident programs (TSRs) are installed.	Delete any TSRs that you do not need.
	You have run out of memory for your application.	Check the memory requirements for the application or add more memory to the workstation.

## Solving CD-ROM Problems

If you encounter CD-ROM problems, refer to the common causes and solutions listed in the following table or to the documentation that came with the optional CD-ROM.

---

**Table 6-9**  
**Solving CD-ROM Problems**

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
System will not boot from CD-ROM drive.	The CD-ROM boot is not enabled through the Computer Setup utility.	Run the Computer Setup utility and set the drive priorities.
CD-ROM devices are not detected, driver is not loaded.	CD-ROM drive is not connected properly or is not properly terminated.	Refer to the documentation that came with the CD-ROM.

## Solving Software Problems

Most software problems occur as a result of the following:

- The application was not installed correctly.
- Memory was not allocated correctly.
- There is a conflict between applications.

## Troubleshooting Using Compaq Intelligent Manageability Features

The Local Alert Pop-Up Dialog notifies you of an impending or actual hardware failure. If the workstation is connected to a network and the Compaq Management Agents for Workstations are installed and configured, a Simple Network Management Protocol (SNMP) trap (message) is sent to the specified SNMP-compliant management application.

The Local Alert Pop-Up Dialog also tells you the steps you need to take prior to a hardware failure to avoid loss of data and damage to the workstation. The system administrator can create a customized action message that might include contact telephone or pager numbers.

To close the Local Alert Pop-Up Dialog, click the Close button. To retrieve fault information after closing the dialog, run Compaq Diagnostics for Windows NT.

For more detailed information see Chapter 3, "Intelligent Manageability."

## Contacting Compaq Customer Support

For help and service, contact your Compaq Authorized Reseller or Dealer. See the "Getting Help" section in the front of this guide for a list of Compaq worldwide technical support telephone numbers.

**NOTE:** If you take your workstation to a Compaq Authorized Reseller, Dealer, or Service Provider for service, remember to provide the setup and power-on passwords if they are set.

## **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  
1-281-514-3333

To identify this product, refer to the part, series, or model number found on the product.



## 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.

## 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。

## Taiwan 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，在這種情況下，使用者會被要求採取某些適當的對策。

## 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 injury from laser radiation or damage to the equipment, observe the following precautions with the CD-ROM drive:

- Do not open any panels, operate controls, make adjustments, or perform procedures to a laser device other than those specified herein.
  - Allow only Compaq Authorized Service Technicians to repair the laser equipment.
  - Do not stare into the laser beam.
- 

## 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 - or - $10,869 \text{ W}\cdot\text{m}^{-2} \text{ sr}^{-1}$
Polarization	Circular 0.25
Numerical Aperture	0.45 inches +/- 0.04 inches

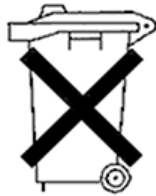
## Battery Replacement Notice

Your computer is provided with a lithium internal battery. 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 battery replacement or proper disposal, contact your Compaq Authorized Reseller or your Authorized Service Provider.



**WARNING:** Your computer contains an internal lithium battery. There is risk of fire and burns if the battery pack is not handled properly. To reduce the risk of personal injury,

- Do not attempt to recharge the battery
  - Do not expose to temperatures higher than 60°C.
  - Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
  - Replace only with the Compaq spare designated for this product.
- 



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.

## **Appendix B**

# **Electrostatic Discharge**

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

To prevent electrostatic damage:

- 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  $\pm$  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 cords must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm<sup>2</sup> 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 cords must be Type SVT or equivalent, No. 18 AWG, 3-conductor. Wall plugs must be a two-pole grounding type with a NEMA 5-15P (15A, 125V).
3. The 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<sup>2</sup> conductor size. Wall plugs must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7A, 125V) configuration.

## ***Appendix D***

# **Routine Workstation Care and Shipping Preparation**

## **Routine Computer Care**

To take care of your computer and monitor:

- Operate the computer on a sturdy, level surface. Leave a 3-inch (7.6-cm) clearance at the back of the system unit and above the monitor to permit the required airflow.
- Never operate the computer with the cover or side panel removed.
- Never restrict the airflow into the computer by blocking the front vents or air intake. Do not place the keyboard, with the keyboard feet down, directly against the front of the desktop unit as this also restricts airflow.
- Keep the computer away from excessive moisture, direct sunlight, and extremes of heat and cold. For information about the recommended temperature and humidity ranges for your computer, refer to Appendix F, “Specifications.”
- Keep liquids away from the computer and keyboard.
- Never cover the ventilation slots on the monitor with any type of material.
- Turn off the computer before you do either of the following:
  - Wipe the exterior of the computer with a soft, damp cloth as needed. Using cleaning products might discolor or damage the finish.
  - Occasionally clean the air vents on the front and back of the computer. Lint and other foreign matter can block vents and limit airflow.

## **CD-ROM Drive Precautions**

Be sure to observe the following guidelines while operating or cleaning your CD-ROM drive.

### **Operation**

- Do not move the drive during operation. This can cause it to malfunction during reading.
- Avoid exposing the drive to sudden changes in temperature because condensation might 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 might malfunction while reading.
- Avoid placing the drive in a location that is subject to high humidity, extreme temperatures, mechanical vibration, or direct sunlight.

### **Cleaning**

- 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, that could damage the finish.

### **Safety**

If any object or liquid falls into the drive, immediately unplug the computer and have it checked by an authorized Compaq Service Provider.

## Shipping Preparation

Follow these steps when preparing to ship your computer:

1. Back up the hard drive files onto PD discs, tape cartridges, or diskettes. Be sure the backup media is not exposed to electrical or magnetic impulses while stored or in transit.

**NOTE:** The hard drive locks automatically when the system power is turned off.

2. Remove and store any program diskettes from the diskette drives.
3. Insert a blank diskette into the diskette drive to protect the drive while in transit. Do not use a diskette on which you have stored or plan to store data.
4. Turn off the computer and external devices.
5. Disconnect the power cord from the electrical outlet, then from the computer.
6. Disconnect the system components and external devices from their power sources, then from the computer.

**NOTE:** Verify that all boards are seated properly and secured in the board slots before shipping the computer.

7. Pack the system components and external devices in their original packing boxes or similar packaging with sufficient packing material to protect them.

**NOTE:** For environmental nonoperating ranges, see Appendix F, "Specifications."

## Appendix E

### Error Codes

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

**Table E-1**  
**Power-On Self-Test Messages**

Message	Beeps*	Probable Cause	Recommended Action
101-Option ROM Checksum Error	1L, 1S	Option ROM checksum	<ol style="list-style-type: none"> <li>1. Inspect the ROM placement.</li> <li>2. Verify the correct ROM.</li> <li>3. Replace the ROM.</li> </ol>
102-System Board Failure	None	DMA, timers, etc.	Replace the system board.

\* L = Long, S = Short

*Continued*

E-2 Error Codes

**Power-On Self Test Message** *Continued*

<b>Message</b>	<b>Beeps*</b>	<b>Probable Cause</b>	<b>Recommended Action</b>
162-System Options Not Set	2S	Configuration incorrect	Run Computer Setup or Windows NT utilities.
		RTC (real-time clock) battery may need to be replaced. Battery life is approximately 5 years.	First reset the date and time under Control Panel. If the problem persists, replace the RTC battery. See Chapter 4, "Hardware Upgrades," for instructions on installing a new battery, or contact your Compaq Authorized Dealer or Reseller for RTC battery replacement.
		CMOS jumper may not be properly installed.	Follow Appendix G instructions on clearing configuration memory for proper placement of the CMOS jumper.

\* L = Long, S = Short

*Continued*

**Power-On Self Test Message** *Continued*

<b>Message</b>	<b>Beeps*</b>	<b>Probable Cause</b>	<b>Recommended Action</b>
163-Time and Date Not Set	2S	Invalid time or date in configuration memory	Set the date and time under Control Panel.
		RTC (real-time clock) battery may need to be replaced. Battery life is approximately 5 years.	If the problem persists, replace the RTC battery. See Chapter 4, "Hardware Upgrades," for instructions on installing a new battery, or contact your Compaq Authorized Dealer or Reseller for RTC battery replacement.
		CMOS jumper may not be properly installed.	Follow Appendix G instructions on clearing configuration memory for proper placement of the CMOS jumper.
164-Memory Size Error	2S	Memory configuration incorrect	Make sure your memory module(s) (if any) are installed properly.

\* L = Long, S = Short

*Continued*

E-4 Error Codes

**Power-On Self Test Message** *Continued*

Message	Beeps*	Probable Cause	Recommended Action
201-Memory Error	None	RAM failure	<ol style="list-style-type: none"> <li>1. Make sure your memory module(s) (if any) are installed properly.</li> <li>2. Replace the memory module(s).</li> <li>3. Replace the system board.</li> </ol>
203-Memory Address Error	None	RAM failure	<ol style="list-style-type: none"> <li>1. Make sure your memory module(s)</li> <li>2. Replace the memory module(s).</li> <li>3. Replace the system board.</li> </ol>
207-ECC Corrected Single Bit Errors in DIMM/SIMM Pair(s) X, X, ...	2S	Single Bit ECC error	Replace DIMM if error persists.
213-Incompatible DIMM Module in DIMM Socket(s) X, X, ...	2S	A DIMM module in DIMM socket identified in the error message is missing critical SPD information, or it is incompatible with the chipset.	Replace the DIMM with a module conforming to the SPD standard. See Chapter 4, "Hardware Upgrades."

\* L = Long, S = Short

*Continued*



**Power-On Self Test Message** *Continued*

<b>Message</b>	<b>Beeps*</b>	<b>Probable Cause</b>	<b>Recommended Action</b>
301-Keyboard Error	None	Keyboard failure	Reconnect keyboard with computer turned off.
303-Keyboard Controller Error	None	I/O board keyboard controller	<ol style="list-style-type: none"> <li>1. Replace the keyboard.</li> <li>2. Replace the system board.</li> </ol>
304-Keyboard or System Unit Error	None	Keyboard failure	<ol style="list-style-type: none"> <li>1. Reconnect the keyboard with computer turned off.</li> <li>2. Replace the keyboard.</li> <li>3. Replace the system board.</li> </ol>
402-Monochrome Adapter Failure	1L, 2S	Monochrome display controller is defective.	Replace the monochrome display controller.
404-Parallel Port Address Conflict Detected	2S	Both external and internal ports are assigned to parallel port X.	Run Computer Setup or Windows NT utilities.
501-Display Adapter Failure	1L, 2S	Video display controller	Replace the graphics board.

\* L = Long, S = Short

*Continued*

**E-6 Error Codes**

**Power-On Self Test Message** *Continued*

<b>Message</b>	<b>Beeps*</b>	<b>Probable Cause</b>	<b>Recommended Action</b>
601-Diskette Controller Error	None	Diskette controller circuitry or floppy drive circuitry incorrect	<ol style="list-style-type: none"> <li>1. Run Setup.</li> <li>2. Check and/or replace cables.</li> <li>3. Replace diskette drive.</li> <li>4. Replace the system board.</li> </ol>
602-Diskette Boot Record Error	None	Diskette in drive A not bootable.	Replace the diskette.
605-Diskette Drive Type Error	2S	Mismatch in drive type	Run Computer Setup or Windows NT utilities.
610-External Storage Drive Failure	None	External tape drive not connected	Reinstall tape drive or press <b>F1</b> and allow system to reconfigure without the drive.
611-Primary Floppy Port Address Assignment Conflict	2S	Configuration error	Run Computer Setup or Windows NT utilities.
612-Secondary Floppy Port Address Assignment Conflict	2S	Configuration error	Run Computer Setup or Windows NT utilities.
912-The Computer Cover Has Been Removed Since Last System Start Up.	None		

\* L = Long, S = Short

*Continued*

**Power-On Self Test Message** *Continued*

<b>Message</b>	<b>Beeps*</b>	<b>Probable Cause</b>	<b>Recommended Action</b>
1151-System Board Com Port 1 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM1.	Run Computer Setup or Windows NT utilities.
1152-System Board Com Port 2 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM2.	Run Computer Setup or Windows NT utilities.
1720-SMART Hard Drive detects imminent failure	None	Hard drive is about to fail.	Back up contents and replace hard drive.
1771-Primary Disk Port Address Assignment Conflict	2S	Internal and external hard drive controllers are both assigned to the primary address.	Run Computer Setup or Windows NT utilities.
1772-Secondary Disk Port Address Assignment Conflict	2S	Internal and external hard drive controllers are both assigned to the secondary address.	Run Computer Setup or Windows NT utilities.
1780-Disk 0 Failure	None	Hard drive/format error	Run Compaq Diagnostics for Windows NT. See Chapter 2, "Software."
1781-Disk 1 Failure	None	Hard drive/format error	Run Compaq Diagnostics for Windows NT. See Chapter 2, "Software."

\* L = Long, S = Short

*Continued*

E-8 Error Codes

**Power-On Self Test Message** *Continued*

<b>Message</b>	<b>Beeps*</b>	<b>Probable Cause</b>	<b>Recommended Action</b>
1782-Disk Controller Failure	None	Hard drive circuitry error	Run Compaq Diagnostics for Windows NT. See Chapter 2, "Software."
1790-Disk 0 Failure	None	Hard drive error or wrong drive type	Run Compaq Diagnostics for Windows NT. See Chapter 2, "Software."
1791-Disk 1 Failure	None	Hard drive error or wrong drive type	Run Compaq Diagnostics for Windows NT. See Chapter 2, "Software."
1792-Secondary Disk Controller Failure	None	Hard drive circuitry error	Run Compaq Diagnostics for Windows NT. See Chapter 2, "Software."
1793-Secondary Controller or Disk Failure	None	Hard drive circuitry error	Run Compaq Diagnostics for Windows NT. See Chapter 2, "Software."
Invalid Electronic Serial Number	None	Electronic serial number has become corrupted.	Run Computer Setup.

\* L = Long, S = Short

*Continued*

**Power-On Self Test Message** *Continued*

<b>Message</b>	<b>Beeps*</b>	<b>Probable Cause</b>	<b>Recommended Action</b>
Audible	1L, 3S	System ROM is bad; system is running in Failsafe Boot Block mode.	Reflash the ROM using a ROMPaq diskette. See the "Failsafe Boot Block ROM" section of Chapter 3, "Intelligent Manageability."
Flashing Power and HD LEDs		Unseated backplane	<ol style="list-style-type: none"> <li>1. Remove backplane.</li> <li>2. Wipe connector.</li> <li>3. Reinstall backplane (see Chapter 4, "Hardware Upgrades," for directions on removing the riser brace).</li> </ol>
Flashing Num Lock	1S, 2L	System memory not present	<ol style="list-style-type: none"> <li>1. Check DIMM (see Chapter 4, "Hardware Upgrades," for directions for installing DIMMs).</li> <li>2. Remove and reseat DIMM.</li> <li>3. See the "Solving Memory Problems" section of Chapter 6, "Troubleshooting."</li> </ol>

\* L = Long, S = Short

*Continued*

**E-10** Error Codes

**Power-On Self Test Message** *Continued*

<b>Message</b>	<b>Beeps*</b>	<b>Probable Cause</b>	<b>Recommended Action</b>
Flashing Caps Lock	1L, 2S	Video controller is not present or is incorrectly initialized.	1. Clear CMOS. 2. If video card has been added, remove and reseal.
Flashing Scroll Lock	2L, 1S	System board hardware failure (prior to video)	Replace the system board.

\* L = Long, S = Short

**NOTE:** If you have replaced the standard keyboard with a Universal Serial Bus (USB) keyboard, you will hear the beep sequences for these error codes but will not see the flashing lights.

## Appendix F

# Specifications

<b>Table F-1 Specifications</b>		
<b>Component</b>	<b>U.S.</b>	<b>Metric</b>
<b>Minitower Dimensions</b>		
Height	17.65 in.	44.83 cm
Width	6.60 in.	16.76 cm
Depth	17.11 in.	43.46 cm
<b>Desktop Dimensions</b>		
Height	6.60 in.	16.76 cm
Width	17.65 in.	44.83 cm
Depth	17.11 in.	43.46 cm
<b>Approximate Weight</b>	26 lb	12 kg
<b>Power Supply</b>	115 VAC	230 VAC
Operating Voltage Range	90-132 VAC	180-264 VAC
Rated Voltage Range	100-127 VAC	200-250 VAC
Rated Line Frequency	50-60 Hz	50-60 Hz

*Continued*

F-2 Specifications

**Specifications** *Continued*

<b>Environmental Requirements</b>	<b>U.S.</b>	<b>Metric</b>
<b>Temperature</b>		
Operating	50° to 95°F	10° to 35°C
Shipping	4° to 140°F	20° to 60°C
<b>Humidity (noncondensing)</b>		
Operating		20% to 80%
Nonoperating		10% to 90%
<b>Maximum Altitude (unpressurized)</b>		
Operating	10,000 ft	3,048 m
Nonoperating	30,000 ft	9,144 m
<b>Power Output</b>	200 W	
<b>Rated Input Current</b>	5.5 A	3 A
<b>(maximum)</b> 145 W 200 W	4 A	2 A
<b>Heat Dissipation</b>	1050 Btu/hr	265 kg-cal/hr
<b>(maximum):</b> 145 W 200 W	750 Btu/hr	189 kg-cal/hr



## Appendix G

# Clearing Configuration Memory

The workstation's configuration memory (CMOS) may occasionally be corrupted. When this occurs, it is usually due to software or hardware that is not functioning accurately, or due to the addition or removal of expansion boards. If the workstation's configuration memory becomes corrupted, it is necessary to clear the configuration memory.

1. Turn off the workstation and any external devices, and disconnect the power cord from the grounded AC outlet.
2. Disconnect the keyboard, monitor, network cable, and any other external devices connected to the workstation.



**WARNING:** To reduce the risk of personal injury from electrical shock and/or hot surfaces, be sure to disconnect the power cord from the wall outlet, and allow the internal system components to cool before touching.

---



**CAUTION:** When the unit is plugged in, the power supply always has 5 volts applied to the system board even when the unit is turned off. Failure to disconnect the power cord can result in damage to the system.

---



**CAUTION:** Static electricity can damage the electronic components of the computer 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 B of this guide for more information.

---

3. Remove the workstation access panel. See the "Removing the Workstation Access Panel" section in Chapter 4.

## G-2 Clearing Configuration Memory

4. Locate the jumper labeled E50.

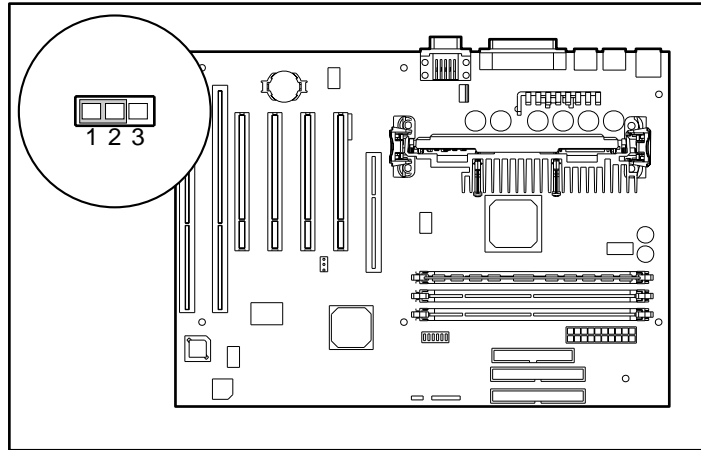


Figure G-1. Locating the E50 jumper and pins 1-3 on the system board

5. Remove the jumper from pins 1 and 2, place it on pins 2 and 3 for approximately 30 seconds, then return it to pins 1 and 2.
6. Replace the workstation access panel.
7. Reconnect the network cable and external devices.
8. Plug in the workstation and turn on power.

**NOTE:** When the CMOS jumper is removed, your passwords will become invalid because the passwords are stored in the configuration memory. You will need to reset your passwords and any special system setups. See Chapter 3, "Intelligent Manageability."

# Index

## A

About This Guide ix  
 ACPI  
   overview 3-25  
 administrator (setup) password 3-7  
 Advanced Configuration and Power  
   Interfaces *See* ACPI  
 AGP  
   connector 1-5  
   slot 4-15  
 Asset Management 3-1, 3-2  
   viewing asset tracking number  
   2-6  
 Asset Tag, setting 2-7  
 AssetControl 3-2  
 ATA hard drive 1-2, 4-24  
 audio board 1-2  
 audio card 4-14  
 audio features  
   headphone connector 1-5  
   line-in audio connector 1-5  
   line-out audio connector 1-5  
   microphone connector 1-5  
 audio security, enabling/disabling  
   2-7  
 Automatic Diagnostics 2-12

## B

battery  
   proper disposal 4-2  
   replacing 4-36  
     illustrated 4-37  
 battery replacement notice A-8  
 bays, drive 1-2, 1-6

beeps 3-19  
 bezel blank  
   removing 4-7  
 BIOS 1-1  
 boot modes 6-1  
 boot order  
   specifying for peripheral devices  
   2-6  
 bus priority, setting 2-8  
 bus speed 4-15  
 buttons, power 3-24

## C

cable select feature 4-24  
 cache memory 1-1  
 Canadian Notice A-4  
 care of your computer D-1  
 CDRH regulations A-6  
 CD-ROM  
   cleaning D-2  
   drive 1-2  
     installing 4-28  
   drive activity light 1-3  
   eject button 1-3  
   headphone jack 1-4  
   precautions D-2  
   volume 1-4  
 CD-ROM problems, solving 6-20  
 Clean Boot mode 6-1  
 CMOS  
   clearing when corrupted G-1  
 Compaq Diagnostics for Windows NT  
   3-2, 3-3, 3-5, 3-7  
   using 3-4  
 Compaq Fast Autosensing Ethernet  
   Network Interface Controller  
   (NIC) NC 3121 *See* NIC.  
 Compaq Management Agents for  
   Workstations 3-5, 3-28, 6-21

## **Index-2**

- Compaq Management Solutions
    - Partners Program 3-2, 3-29
  - Compaq Support Software CD kit 3-26. *See* Support Software CD kit
  - Compaq Website xi, 2-1, 3-17, 3-18, 3-22, 3-26
  - computer care
    - cleaning exterior D-1
    - routine care D-1
    - shipment preparation D-3
  - Computer Checkup (TEST) *See* TEST
  - Computer Setup
    - exiting without saving changes 2-8
    - replicating 3-23
    - restoring configuration from diskette 2-8
    - restoring factory default settings 2-8
    - saving changes and exiting 2-8
    - saving configuration to a diskette 2-8
  - Computer Setup utilities 1-2, 2-2, 2-4
    - using 2-5
  - configuration features 1-1
  - Configuration Management 3-1, 3-16
    - ACPI, overview 3-25
    - dual-state power button 3-24
    - Power Management 3-25
    - Remote Security Management 3-21
    - Remote Wakeup and Remote Shutdown 3-23
    - replicating your setup 3-23
    - upgrading the ROM 3-17
  - configuration memory *See* CMOS
  - configuration, system 4-4
  - CPU serial number, viewing 2-6
- ## **D**
- date, setting 2-6
  - Declaration of Conformity A-3
  - delimiter characters 3-14
  - Descriptive Boot mode 6-1
  - desktop configuration
    - changing to minitower 4-11
    - illustrated 4-13
  - Desktop Management Interface (DMI) 3-2. *See* DMI
  - device drivers 1-2
  - diagnostic features 1-2, 2-2, 2-9
    - Computer Checkup (TEST) 2-10
    - View System Information (INSPECT) 2-10
  - Diagnostics for Windows NT 3-2, 3-3, 3-5, 3-7
    - using 3-4
  - DIMMs (dual inline memory modules) 1-1, 4-15
    - installing 4-15
  - disk problems, solving 6-4, 6-6
  - Diskette boot, disabling 3-8
  - diskette drive 1-2
    - activity light 1-4
    - enabling/disabling diskette boot 2-6
    - enabling/disabling diskette write 2-6
    - viewing current devices and setting resources 2-6
  - diskette eject button 1-3
  - Diskette write, disabling 3-8
  - display problems, solving 6-8

DMI 3-2  
 overview 3-27  
 drive bays 1-2, 1-6, 4-14  
 drive cables  
   connecting 4-34  
   illustrated 4-29  
 drive mounting screws 4-14  
 drive positions  
   illustrated 1-6  
 drivelock 4-14  
 drives  
   installing optional 3.5-inch 4-31  
     illustrated 4-32  
   installing optional 5.25-inch  
     4-28  
     illustrated 4-29  
   installing optional, guidelines  
     4-23  
   installing, illustrated 4-9  
   removing 4-34  
     illustrated 4-35  
 dual inline memory modules  
   (DIMMs) 1-1  
   installing 4-15  
 dual-state power button 3-24

## E

ECC 1-1, 4-15  
 ECC Fault Prediction 3-6  
 electrostatic discharge B-1  
 energy saver mode  
   enabling/disabling power LED  
     blink 2-7  
   selecting timeout values 2-7  
   setting 2-6  
 enhanced keyboard 1-2, 1-7  
   connector 1-5  
   enabling and disabling 3-15

enhanced keyboard *Continued*  
   illustrated 1-7  
   tilt feet 1-10  
   using Windows logo keys 1-8  
 Error Checking and Correcting (ECC)  
   memory *See* ECC  
 Error Checking and Correcting  
   memory (ECC) *See* ECC  
 error codes *See* POST  
 Ethernet network interface controller  
   1-2. *See* NIC  
 European Union Notice A-4  
 expansion board  
   installing 4-18  
   removing 4-21  
 expansion slots 1-1, 4-14  
 external SCSI connector 1-5

## F

FailSafe Boot Block ROM 3-8, 3-19  
 Fault Management 3-1, 3-5  
   ECC Fault Prediction 3-6  
   Pre-failure Warranty for ECC  
     memory 3-6  
   Proactive Backup 3-6  
   SMART III Hard Drive Fault  
     Prediction 3-5  
   surge-tolerant power supply 3-6  
   Ultra ATA Integrity Monitoring  
     3-5  
 features 1-1  
 Federal Communications Commission  
   (FCC) A-1  
 flash ROM 3-17  
   upgrading 3-17  
 front bezel  
   removing 4-6

## Index-4

front panel components  
  CD-ROM drive activity light  
    1-3  
  CD-ROM eject button 1-3  
  CD-ROM headphone jack 1-4  
  CD-ROM volume 1-4  
  diskette drive activity light 1-4  
  diskette eject button 1-3  
  hard drive activity light 1-3  
  power-on light 1-3

## G

Getting Help xi  
graphics controller  
  setting boot order 2-8  
grounding methods B-2

## H

hard drive 1-2  
  drive position 1-6  
  Ultra ATA 4-24  
hard drive activity light 1-3  
hardware installation problems,  
  solving 6-13  
hardware, optional  
  installation overview 4-3  
headphone connector 1-5  
<http://www.compaq.com> xi, xii

## I

I/O delay, setting 2-8  
icon  
  broken key 3-11  
  key 3-11  
Icons *See* Symbols on Equipment  
IDE devices, viewing information  
  2-6

INSPECT 2-10, 2-11  
installation sequence 4-3  
installing  
  optional hardware, overview 4-3  
installing a SCSI device 4-27  
Integration Management 3-1, 3-27  
  DMI 3-27  
Intelligent Manageability 1-2, 6-21  
  Asset Management 3-2  
  Compaq Management Solutions  
    Partners 3-29  
  Configuration Management 3-16  
  Diagnostics for Windows NT  
    3-3  
  Fault Management 3-5  
  overview 3-1  
  Security Management 3-7  
internal components 4-14  
international regulations A-6  
interrupt sharing, enabling/disabling  
  2-8  
IRQ settings, configuring for PCI  
  devices 2-8  
ISA back-to-back I/O delay, setting  
  2-8

## J

Japanese Notice A-5

## K

key icon 3-11  
keyboard 1-2, 1-7  
  connector 1-5  
  enabling and disabling 3-15  
  illustrated 1-7  
  national delimiter characters  
    3-14

keyboard *Continued*  
 placement D-1  
 setting locale 2-7  
 tilt feet 1-10  
 using Windows logo keys 1-8  
 keyboard lights  
 identifying 1-9  
 illustrated 1-9, 3-21  
 keyboard tilt feet, illustrated 1-10  
 keys  
 Windows logo 1-7

**L**

laser devices A-6  
 laser product label A-7  
 LED blink, enabling/disabling during  
 energy save 2-7  
 lights  
 keyboard 1-9  
 line-in audio connector 1-5  
 line-out audio connector 1-5  
 Local Alert Pop-Up Dialog 6-21

**M**

Management Agents for Workstations  
 3-28, 6-21  
 memory 1-1  
 installing additional 4-15  
 viewing size 2-6  
 memory modules  
 installing 4-15  
 sockets 4-14  
 memory problems, solving 6-18  
 microphone connector 1-5  
 Microsoft Windows NT Workstation  
 1-1, 2-1  
 installing over network 2-1

minitower configuration  
 changing to desktop 4-8  
 illustrated 4-10  
 minor problems, solving 6-3  
 monitor connector 1-5  
 mouse 1-2  
 connector 1-5  
 enabling and disabling 3-15  
 mouse compliance statement A-4

**N**

network  
 cable to RJ-45 connector 5-2  
 controller 5-1  
 installing drivers 5-3  
 interface connector 1-5  
 RJ-45 connector  
 connecting to 5-2  
 Token Ring 5-1  
 network communications 5-1  
 network interface controller 1-2  
 network problems, solving 6-14  
 network server mode,  
 enabling/disabling 2-7  
 NIC 1-2, 4-14, 5-1  
 connector 1-5  
 Num Lock state, setting 2-8

**O**

operating system 1-1, 2-1  
 installing over network 2-1  
 optional hardware  
 installation overview 4-3

**P**

parallel connector 1-1, 1-5  
 parallel interface control 3-7

## **Index-6**

- parallel interface, disabling 3-9
  - parallel port
    - disabling 2-7
    - enabling 2-7
    - setting resources 2-8
  - passwords 3-7
    - changing 3-12
    - clearing 3-13
    - entering 3-11
    - establishing 3-10
    - power-on 3-11
    - setup 3-10
  - PCI bus mastering, enabling/disabling 2-8
  - PCI devices, viewing currently
    - installed devices 2-8
  - PCI VGA palette snooping, enabling/disabling 2-8
  - Plug and Play (PnP) devices, viewing
    - current settings 2-8
  - POST 6-1, E-1–E-10
    - setting the POST mode 2-7
  - power button
    - configuring for suspend 3-24
  - power cord connector 1-5
  - power cord set requirements C-1
  - power LED blink, enabling/disabling 2-7
  - Power Management 3-25
  - power supply 1-1, 4-15
    - surge tolerance 3-6
  - power switch
    - setting configuration 2-7
  - power-on light 1-3
  - Power-on Password 3-7, 3-10
    - enabling 2-7
  - Power-On Self-Test *See* POST
    - setting the POST mode 2-7
  - Power-On Self-Test messages *See* POST
  - Pre-failure Warranty for ECC memory 3-6
  - PremierSound 1-2
  - printer mode, setting 2-8
  - printer problems, solving 6-12
  - Proactive Backup 3-6
  - processor 4-15
  - processor, viewing speed and type 2-6
  - product name, viewing 2-6
  - Prompted Diagnostics 2-12
- ## **Q**
- Quick Check Diagnostics 2-12
  - QuickBoot, selecting 2-7
  - QuickLock/QuickBlank 3-7, 3-15
    - disabling 2-7
    - enabling 2-7
- ## **R**
- rear audio connectors
    - headphone connector 1-5
    - line-in audio connector 1-5
    - line-out audio connector 1-5
    - microphone connector 1-5
  - rear panel connectors
    - AGP connector 1-5
    - external SCSI connector 1-5
    - keyboard connector 1-5
    - mouse connector 1-5
    - NIC connector 1-5
    - parallel connector 1-5
    - power cord connector 1-5
    - serial connector 1-5
    - serial, second connector 1-5



- rear panel connectors *Continued*
    - Universal Serial Bus (USB)
      - connector 1-5
      - voltage select switch 1-5
  - reconfiguring the computer 6-4, 6-13
  - registering your workstation 2-13
  - reinstalling your software 2-13
  - Remote Management Administrators Guide 3-18, 3-22
  - remote ROM flash 3-18
  - Remote Security Management 3-21
  - Remote System Installation 3-23
  - Remote Wakeup and Remote Shutdown 5-2
  - removable media
    - boot control 3-7
    - write control 3-7
  - replicating your setup 3-23
  - RJ-45 connector
    - connecting to network 5-2
    - illustrated 5-3
  - ROM upgrade
    - local 3-17
    - recovery from ROM upgrade
      - failure 3-19
      - remote 3-18
  - ROMPaq
    - diskette 3-17
    - upgrading ROM BIOS 3-17
- S**
- screws
    - identifying, illustrated 4-23
  - SCSI adapter, 68- to 50-pin 4-27
  - SCSI connector 1-5
  - SCSI controller 4-14
  - SCSI devices
    - 68- to 50-pin adapter 4-27
    - SCSI devices *Continued*
      - cabling 4-26
      - hard drive 1-2
      - important installation guidelines 4-25
      - installing 4-25
      - setting ID numbers 4-25
      - terminating SCSI chain 4-25
    - SCSI ID numbers, setting 4-25
    - SCSI problems
      - solving 6-7
    - SDRAM 1-1
    - security 1-2
    - security management 3-1, 3-7
      - enabling a Power-on Password 2-7
      - enabling a Setup Password 2-7
      - enabling/disabling network server mode 2-7
      - enabling/disabling QuickLock/QuickBlank 2-7
      - features, overview 3-7
    - serial connector 1-1, 1-5
    - serial interface control 3-7
    - serial interface, disabling 3-9
    - serial number 1-10
    - serial port
      - disabling 2-7
      - enabling 2-7
      - setting resources 2-8
    - serial, second connector 1-5
    - setup
      - replicating 3-23
    - Setup Password 3-7, 3-10
      - enabling 2-7
    - setup utilities *See* Computer Setup utilities.
    - shipment preparation D-3

## ***Index-8***

- Simple Network Management
  - Protocol *See* SNMP
- slots, expansion 4-14
- SMART III Hard Drive Fault
  - Prediction 3-5
- SNMP 3-5, 3-28
- software
  - reinstalling 2-13
  - support 3-26
- Software Installation Guide 2-13, 4-2, 5-1
- software problems, solving 6-20
- speaker 1-2
- special function keys
  - illustrated 1-7
- specifications F-1
- subpanel, removing 4-7
- support software 1-2, 3-26
- Support Software CD kit 3-17, 3-18, 3-22, 3-26
- surge-tolerant power supply 3-6
- suspend mode
  - enabling/disabling power LED blink 2-7
  - setting power button configuration 2-7
- suspend, configuring power button 3-24
- Symbols
  - in text x
  - on equipment x
- synchronous dynamic random access memory (SDRAM) *See* SDRAM
- system board revision, viewing 2-6
- system bus speed 4-15
- system configuration 4-4
- system ROM date, viewing 2-6
- system time and date, setting 2-6

## **T**

- Taiwan Notice A-5
- tape drive, installing 4-28
- technical support 6-21
- Telephone Numbers xii
- TEST 2-10
  - using 2-11
- Text Conventions ix
- three-button mouse 1-2
- time, setting 2-6
- timeout values, selecting 2-7
- Token Ring network 5-1
- troubleshooting
  - CD-ROM problems 6-20
  - contacting Compaq customer support 6-21
  - disk problems 6-4, 6-6
  - display problems 6-8
  - hardware installation problems 6-13
  - helpful hints 6-2
  - memory problems 6-18
  - minor problems 6-3
  - network problems 6-14
  - printer problems 6-12
  - SCSI problems 6-7
  - software problems 6-20

## **U**

- Ultra ATA devices 4-24
- Ultra ATA Integrity Monitoring 3-5
- Ultra ATA SMART hard drive 1-2
- Universal Serial Bus *See* USB
- Universal Serial Bus (USB) connector
  - See* USB
- upgrading the ROM 3-17

USB  
    connector 1-2, 1-5  
USB port  
    enabling/disabling 2-7  
using  
    Compaq Diagnostics for  
        Windows NT 3-4  
    Computer Checkup (TEST) 2-11  
    View System Information  
        (INSPECT) 2-11  
utilities *See* Computer Setup utilities.

## **V**

VGA controller, setting boot order  
    2-8  
View System Information (INSPECT)  
    *See* INSPECT  
voltage select switch 1-5

## **W**

website 2-1, 3-17, 3-18, 3-22, 3-26  
Wide-Ultra SCSI SMART hard drive  
    1-2  
Windows logo key 1-7  
Windows NT Workstation 1-1, 6-13  
    installing over network 2-1  
work environment  
    positioning equipment D-1  
workstation access panel  
    removing 4-5  
    illustrated 4-5  
Workstation Software Reference  
    Addendum 3-28