COMPAQ

Professional Workstation AP400

Reference Guide

First Edition (July 1998)
Part Number 317787-002
Compaq Computer Corporation

Notice

The information in this publication is subject to change without notice.

COMPAQ COMPUTER CORPORATION SHALL NOT BE LIABLE FOR TECHNICAL OR EDITORIAL ERRORS OR OMISSIONS CONTAINED HEREIN, NOR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE FURNISHING, PERFORMANCE, OR USE OF THIS MATERIAL. THIS INFORMATION IS PROVIDED “AS IS” AND COMPAQ COMPUTER CORPORATION DISCLAIMS ANY WARRANTIES, EXPRESS, IMPLIED OR STATUTORY AND EXPRESSLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE, GOOD TITLE AND AGAINST INFRINGEMENT.

This publication contains information protected by copyright. No part of this publication may be photocopied or reproduced in any form without prior written consent from Compaq Computer Corporation.

© 1998 Compaq Computer Corporation.
All rights reserved. Printed in the U.S.A.

The software described in this guide is furnished under a license agreement or nondisclosure agreement. The software may be used or copied only in accordance with the terms of the agreement.

Compaq, Compaq Insight Manager, ROMPaq, QVision, SmartStart, NetFlex, QuickFind, PaqFax, registered United States Patent and Trademark Office.

Netelligent, SoftPaq, QuickBlank, QuickLock are trademarks and/or service marks of Compaq Computer Corporation.

Microsoft, MS-DOS, Windows, and Windows NT are registered trademarks of Microsoft Corporation.

Other product names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

Compaq Professional Workstation AP400 Reference Guide

First Edition (July 1998)
Part Number 317787-002

Contents

About This Guide

Text Conventions ix
Symbols in Text x
Product Safety Information x
Symbols on Equipment x
Laser Precautions xi
Getting Help xi
Compaq Website xi
Telephone Numbers xii

Chapter 1
Product Features

Standard Features 1-2
SmartStart for Workstations 1-5
Front Panel Components 1-6
Rear Panel Components 1-8
Keyboard and Mouse 1-10
Special Mouse Functions 1-10
Special Keyboard Functions 1-10
Windows Logo Key 1-13
Keyboard Lights 1-14

Chapter 2
Compaq Setup and Diagnostic Software

Accessing the Compaq Utilities Menu 2-1
Computer Setup 2-2
Computer Checkup (TEST) 2-4
View System Information (INSPECT) 2-6
Create a Diagnostics Diskette 2-6
Manage a Diagnostics Partition 2-7
Exit from This Utility 2-7
ROM BIOS 2-8
Power-On Self-Test 2-8
Runtime Services 2-8

Compaq Setup and Diagnostic Software *continued*
Upgrading the ROM BIOS 2-9
Boot Block ROM 2-9

Chapter 3
Security Features
Password Security 3-2
Power-on Password 3-2
Setup Password 3-7
Advanced Security Management 3-13
Disabling Diskette Boot or Diskette Write 3-15
Disabling a Serial Port or Parallel Port 3-16
Enabling QuickLock/QuickBlank 3-17
Smart Cover Sensor 3-19
Cable Lock Provision 3-20

Chapter 4
Intelligent Manageability
Configuration Management 4-1
Upgrading the ROM 4-2
FailSafe Boot Block ROM 4-4
Remote Security Management 4-6
Remote Wakeup and Remote Shutdown 4-7
Establishing Power Management Settings 4-7
Advanced Configuration and Power Interfaces (ACPI) Capable 4-8
Enhanced Compaq Support Software CD Kit and Support from the Compaq Website ... 4-9
Asset Management 4-11
Compaq Diagnostics for Microsoft Windows NT 4-11
Compaq Insight Manager and Insight Management Agents 4-13

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 Drivers 5-3
Changing the Default Configuration 5-3

Chapter 6
CD-ROM Drive and PremierSound Audio System

Using the Tray-Load CD-ROM Drive 6-1
Using CD-ROM Software 6-3
Using Audio Compact Discs 6-4
CD-ROM Drive Precautions 6-4
PremierSound Audio System 6-5

Chapter 7
Hardware Upgrade Preparations

Installation Sequence 7-2
Reconfiguring the Workstation 7-4
Removing the Workstation Cover 7-5
Removing the Front Bezel 7-6
Identifying Internal Components 7-7
Removing the Expansion Board Bracket 7-8
Removing the System Board with Tray 7-9
Identifying System Board Components 7-11

Chapter 8
Memory Upgrades

Installing Additional Memory 8-1
Important Guidelines for DIMM Installation 8-2
Installing DIMM Modules 8-4

Chapter 9
Drives

Installing Additional Drives 9-1
Removing a Blank Drive Bezel 9-2
Removing the EMI Shield 9-3
Installing a 1.6-inch Hard Drive in Bay 5 9-4
Installing an Optional Diskette, CD-ROM, or Tape Drive 9-7
Installing a 3.5-Inch Drive in a 5.25-Inch Drive Bay 9-9
Installing Optional SCSI Devices 9-11
Important Guidelines for Installing Optional SCSI Devices 9-11
Using the SCSI Cable 9-12
Installing a SCSI Device 9-13

Chapter 10
Expansion Boards

Installing an Expansion Board 10-1
Removing an Expansion Slot Cover 10-3
Installing a PCI or ISA Board 10-4
Accelerated Graphics Port (AGP) Graphics Controller Connector 10-5
Installing and Removing an AGP Graphics Controller 10-5

Chapter 11
Processors

Installing an Additional Processor 11-1
Upgrading the Processor 11-3
Installing the Primary Processor Power Module Cable Insulator 11-4

Chapter 12
Troubleshooting

Checklist for Minor Problems 12-1
Troubleshooting Common Problems 12-3
Minor Problems 12-3
Diskette Drive Problems 12-6
Display Problems 12-8
Audio Problems 12-10
Printer Problems 12-11
Hardware Installation Problems 12-12
Network Problems 12-13
Memory Problems 12-17
CD-ROM Drive Problems 12-18

Appendix A
Regulatory Compliance Notices

Federal Communications Commission Notice A-1
Class A Equipment A-1
Class B Equipment A-2
Declaration of Conformity for Products Marked with FCC Logo, United States Only A-3
Modifications A-3
Mouse Compliance Statement A-4
Cables A-4

Regulatory Compliance Notices *continued*

Canadian Notice (Avis Canadien) A-4
Class A Equipment A-4
Class B Equipment A-4
European Union Notice A-5
Japanese Notice A-5
Taiwan Notice A-6
Laser Devices A-6
Laser Safety Warnings A-6
Compliance with CDRH Regulations A-7
Compliance with International Regulations A-7
Laser Product Label A-7
Laser Information A-7
Battery Replacement Notice A-8

Appendix B
Electrostatic Discharge
Grounding Methods B-1

Appendix C
Power Cord Set Requirements
General Requirements C-1
Country-Specific Requirements C-2

Appendix D
POST Error Messages
Error Messages D-1

Appendix E
Installing a New Battery
Running Computer Setup E-1
Installation Procedures E-2

Appendix F
Smart Cover Sensor Settings
Sensor Settings F-1

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:

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

Symbols in Text

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

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

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

IMPORTANT: Presents clarifying information or specific instructions.

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

Product Safety Information

Symbols on Equipment

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

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

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

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

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

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

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

Laser Precautions

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

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

Getting Help

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

Compaq Website

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

Telephone Numbers

For the name of your nearest Compaq Authorized Reseller:

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

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

Compaq Worldwide Offices

Country	Main Phone Number & Fax
Argentina	+541-796-8100 Fax: +541-796-5151
Australia	+61-2-9911-1999 Fax: +61-2-9911-1800
Austria	+431-87816-0 Fax: +431-878-16-80 CompaqCare Center: +0222-8716-16
Belgium	+322-716-9511 Fax: +322-725-2213 CompaqCare Center: 02-716-9696
Brazil	+55-11-246-7866 Fax: +55-11-524-8050
Canada	905-707-1715 Fax: 416-229-8898
Central America & Caribbean	281-518-2206 Fax: 281-518-8166

Continued

Compaq Worldwide Offices *Continued*

Chile	+562-200-8100 Fax: +562-252-0540
China	+86-10-849-2928 Fax: +86-10-834-6726
Colombia	+571-312-0147 Fax: +571-312-0164
Czech Republic	+422-232-8772 Fax: +422-232-8773
Denmark	+45-4590-4590 Fax: +45-4590-4595 CompaqCare Center: +45-4590-4545 QuickLine: +45-4590-4550
Ecuador	+011-59-3-225-4343 +011-59-3-246-7713 +011-59-3-246-7715 Fax: +011-59-3-225-4342
Europe, Middle East, and Africa	+49-89-9933-0 +49-89-9101705
Finland	+358-0-615-599 Fax: +358-0-6155-9898 CompaqCare Center: +358-9800-206-720 QuickLine: +358-0-6155 9870
France	+331-4133-4100 Fax: +331-4133-4400 CompaqCare Center: +331-4133-4455 QuickLine: +331-6986-7396 FaxPaq: Minitel 3616
Germany	+49-89-9933-0 Fax: +49-89-9933-1158 Compaq Infoline: 01803-221221 CompaqCare Center: 0190-888080 QuickLine: 01805-212111 FaxPaq: 01805-212119

Continued

Compaq Worldwide Offices *Continued*

Eastern Europe, the Middle East, and Africa are also supported from Germany.	Fax: +49-(0)89-9933-2899 CompaqCare Center: +49-(0)89-9933-2891 QuickLine: +49-(0)89-9933-1380
Hong Kong	+85-2-2867-1600 Fax: +85-2-2524-9533
Hungary	+36-1-201-8776 Fax: +36-1-201-9696
India	+91-80-559-6023 +91-80-559-6024 Fax: +91-80-559-6025
Ireland	+00-353-1-2141000 Fax: +00-353-1-2141001
Italy	+39-2-5759-01 Fax: +39-2-824-2015 CompaqCare Center: 01-67825012 (Information) 02-575-90300 (Technical) QuickLine: 02-89-200-222
Japan	+3-5402-5700 Fax: +3-5402-5964
Korea	+82-2-3470-0766 Fax: +82-2-523-3576
Malaysia	+603-7541122 Fax: +603-7548600
Mexico	+525-229-7900 Fax: +525-229-7959
Middle East	+971-4-818 100 Fax: +971-4-818 313
The Netherlands	+31-182-565888 Fax: +31-182-538348 CompaqCare Center: +82065805 (Information) +82065810 (Technical) QuickLine: +820-72366 FaxPaq: +820-65805

Continued

Compaq Worldwide Offices *Continued*

Distribution Center Europe	+31-183-696400 Fax: +31-183-620488
New Zealand	+64-9-307-3143 Ext.817 Fax: +64-9-309-9198
Norway	+47-2207-2000 Fax: +47-2207-2001 CompaqCare Center: +47-2207-2020 QuickLine: +47-2207-2022
Poland	+48-22-630-3535 Fax: +48-22-630-3553
Portugal	+3511-412-8400 Fax: +3511-412-0654
Puerto Rico	809-765-4360 Fax: 809-765-4336
Russia	+7095-9671700 Fax: +7095-9671701
Scotland	+44-141-814-8000 Fax: +44-141-812-7745
Singapore/APD	
Compaq Computer Asia/Pacific (Regional Headquarters)	+65-336-3333 Fax: +65-750-4627
Compaq Computer Asia/Pacific (Local Subsidiary including regional sales for South Asia, Indochina, Brunei, Indonesia and the Philippines)	+65-753-6688 Fax: +65-758-5975
Compaq Asia	+65-750-4319 Fax: +65-752-7385
Spain	+341-640-1500 Fax: +341-640-0064 CompaqCare Center: +341-640-1302/1427 QuickLine: +341-640-0267

Continued

Compaq Worldwide Offices *Continued*

South Africa	+27-11-728-6999 Fax: +27-11-728-3335
Sweden	+468-703-5200 Fax: +468-751-2057 CompaqCare Center: 08-703-52-40 QuickLine: +468-703-5220 FaxPaq: 08-703-52-25
Switzerland	+41-1838-2111 Fax: +41-1836-7107 CompaqCare Center: +41-1838-2222 QuickLine: +41-1838-2421 FaxPaq: +41-1838-2238
Taiwan	886-2-2735-1000 Fax: 886-2-2732-2660
Thailand	+66-2-679-6222 Fax: +66-2-679-6220
United Kingdom	+44-1-41-270-4000 Fax: +44-1-41-270-4100 CompaqCare Center: +44-1-41-270-4000 QuickLine: +44-1-81-332-9499 FaxPaq: +44-1-81-332-3550
United States (Corporate Office)	281-370-0670 Fax: 281-514-1740
Austin	512-433-6000 Fax: 512-433-6029
Venezuela	+582-953-8844 Fax: +582-952-7393

Chapter 1
Product Features

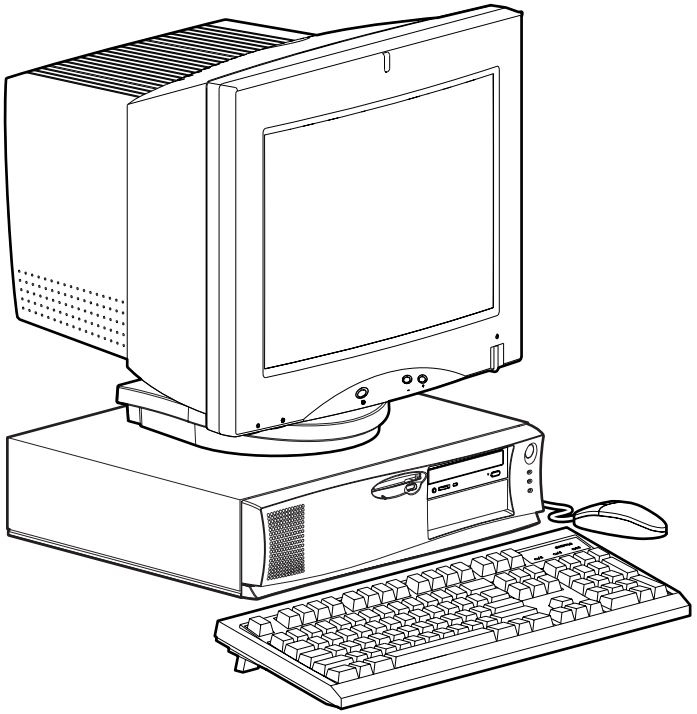


Figure 1-1. Compaq Professional Workstation AP400

Standard Features

The Compaq Professional Workstation AP400 offers the following standard features:

Table 1-1
Compaq Professional Workstation AP400 Standard Features

Feature	Compaq Professional Workstation AP400
Processors	Standard with one 350-MHz, 400-MHz, or 450-MHz Intel Pentium II processor
Number of Processors	One processor, upgradable to two
L2 Cache Size	512 KB
Memory	64-MB or 128-MB, 100-MHz Registered SDRAM (upgradable to 1 GB)
Optional Memory Upgrades	Supports 100-MHz ECC 32-MB, 64-MB, 128-MB, or 256-MB Registered SDRAM DIMMs. (Single DIMMs can be inserted in any of the four available DIMM sockets.)
Error Checking and Correcting (ECC) Memory	Uses an encoding scheme for memory error detection and correction. (Specifically, this feature detects and corrects all single-bit memory errors, and detects and reports double-bit errors.)
Graphics Controller	Ships with 2D or 3D graphics controller. Refer to the appropriate guide on the SmartStart for Workstations CD under X:\DOCS\GRAPHICS, where X is your CD-ROM drive designation.
Expansion Slots	Three dedicated PCI slots One shared PCI/ISA slot (1 full-length PCI/ISA) One dedicated ISA slot (1 short ISA) 1 Accelerated Graphics Port (AGP) (located on system board)
Drive Controller	Integrated IDE controller and Integrated Wide-Ultra SCSI controller on PCI local bus

Continued

Compaq Professional Workstation AP400 Standard Features *Continued*

Feature	Compaq Professional Workstation AP400
Network Controller	Compaq Fast Ethernet Embedded NIC NC3121 (10/100 Mbps) (RJ-45 connector only)
Hard Drive Types	Ultra ATA (IDE) or Wide-Ultra SCSI (To find your specific hard drive size, double-click on *My Computer,* then click on the drive you want to check. Click *File,* then click *Properties.)*
Secondary Storage	3.5-inch diskette drive CD-ROM drive (available on select models)
Drive Bays	Five drive bays (two available)
Standard External Interfaces	Serial (two available) Parallel USB (two available)-hardware ready Wide-Ultra SCSI VGA (available on select models) Ethernet (RJ-45) Audio (headphone and microphone connectors) Keyboard Mouse Accelerated Graphics Port (AGP) (available on select models)
Audio	Integrated/ported speaker built into the cabinet Integrated audio chip provides stereo sound and FM music synthesis Stereo inputs Microphone jack Stereo line in/line out Stereo headphone jack
ROM	Software upgradable ROM via ROMPaq Utility FailSafe Boot-Block ROM
Power Supply	200-Watt power supply with voltage selector switch and auxiliary power.
Software	Microsoft Windows NT Workstation 4.0, Compaq support software, and Compaq utilties (preinstalled)

Continued

Compaq Professional Workstation AP400 Standard Features *Continued*

Feature	Compaq Professional Workstation AP400
Intelligent Management	Remote ROM update Remote Security Management Remote Wakeup and Remote Shutdown Establishment of Power Management Settings Advanced Configuration and Power Interface (ACPI) capable Enhanced Support Software CD and support from Compaq website For more information, see Chapter 4
Asset Management	Compaq Diagnostics for Windows NT For more information, see Chapter 4
Security Features	Keyboard password Administrator password QuickLock/QuickBlank Diskette Write Control Diskette Boot Control Serial Interface Control Security Lock Provision Smart Cover Sensor
Diagnostic Tools	Power-On Self-Test (POST) Diagnostics (DIAGS) Computer Setup and Inspect ROMPaq utilities to upgrade ROM
Warranty	Three years (limited)

SmartStart for Workstations

If the preinstalled software on your workstation has been deleted, you can install Microsoft Windows NT 4.0, Compaq support software, and Compaq utilities 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.

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.*

Front Panel Components

The following figure identifies the front panel components. Refer to the corresponding table for a description of each component.

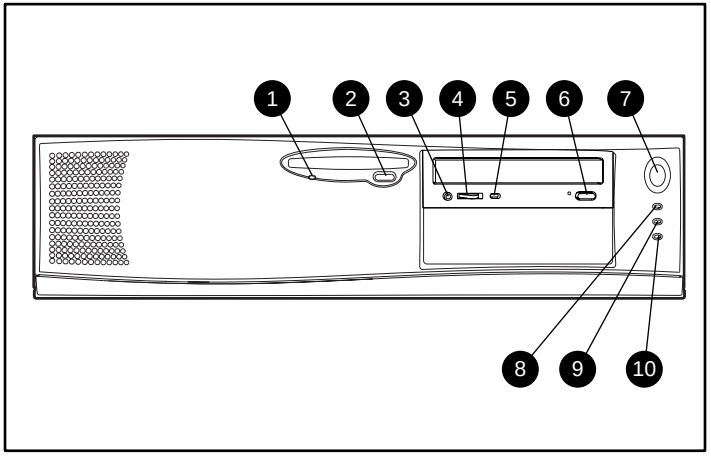


Figure 1-2. Identifying front panel components

Table 1-2
Front Panel Components

Ref.	Component	Function
❶	Diskette drive LED	When lit, indicates the drive is reading or writing data
❷	Diskette drive ejector button	Partially ejects 3.5-inch diskette from diskette drive
❸	Headphone jack	Connects the headphones (available on select models)
❹	Volume control	Controls headphone volume (available on select models)
❺	CD-ROM drive LED	When lit, indicates the CD-ROM drive is reading data (available on select models)
❻	CD-ROM drive load/eject button	Loads or ejects a CD (available on select models)

Continued

Front Panel Components *Continued*

Ref.	Component	Function		
❼	Power switch	Turns the workstation on or off		
❽	Power on/off LED	**Mode**	**Description**	**Recommended Action**
		Off	Workstation is ready to be powered on.	Turn on the workstation.
		Steady Amber	The expansion board bracket is not seated properly. System will not turn on.	Disconnect the power cord and **properly** seat the expansion board bracket, then reconnect the power cord and turn on the workstation.
		Steady Green	Workstation is turned on. The expansion board bracket is seated properly.	No action required.
		Blinking Green	Workstation is in standby mode.	No action required
❾	Hard drive activity LED	When lit, indicates the workstation is reading or writing data to the hard drive(s)		
❿	Network activity LED	When lit, indicates the workstation is receiving or sending data on the network		

Rear Panel Components

The following figure illustrates the location of the external connectors as well as the serial number.

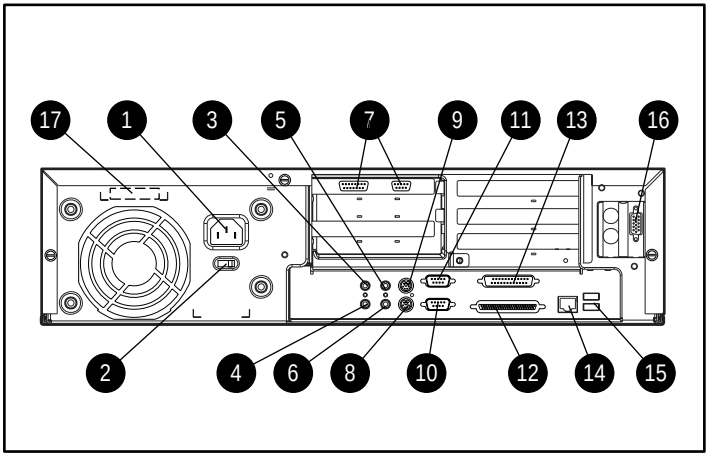


Figure 1-3. Identifying rear panel components

Table 1-3
Rear Panel Components

Ref.	Component	Function
❶	Power cord connector	Connects the power cord
❷	Voltage Selector Switch	Switches voltage from 115V to 230V
❸	Audio line-in connector	Connects a device that supplies sound, such as a tape deck or CD player
❹	Audio line-out connector	Connects an external amplifier (to power additional speakers) or a tape deck for recording
❺	Microphone connector	Connects a microphone
❻	Headphone jack	Connects to headphones
❼	Video port	Connects a monitor (available on select models)

Continued

Rear Panel Components *Continued*

Ref.	Component	Function
❽	Keyboard connector	Connects to a keyboard (orange icon)
❾	Mouse connector	Connects to a mouse (green icon)
❿	Serial port connector	Connects a serial device, such as a serial printer COM 2 (B) on top, COM 1 (A) on bottom
⓫	Serial port connector	Connects a serial device, such as a serial printer COM 2 (B) on top, COM 1 (A) on bottom
⓬	SCSI port	Connects to a SCSI device
⓭	Parallel port connector	Connects a parallel device such as a printer
⓮	RJ-45 connector	Connects to the Ethernet network
⓯	USB connectors (2)	Connects to USB devices
⓰	Accelerated Graphics Port (AGP) graphics controller connector	Connects a monitor (available on select models)
⓱	Serial number	Identifies the workstation

Keyboard and Mouse

The Compaq Professional Workstation AP400 ships with a keyboard and a three-button mouse.

Special Mouse Functions

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

The Logitech OEM MouseWare software provides special drivers and an applet that allows you to define the functionality of the mouse buttons. For more information on installing this software, refer to the *Workstation Software Reference* included on the SmartStart for Workstations CD.

Special Keyboard Functions

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

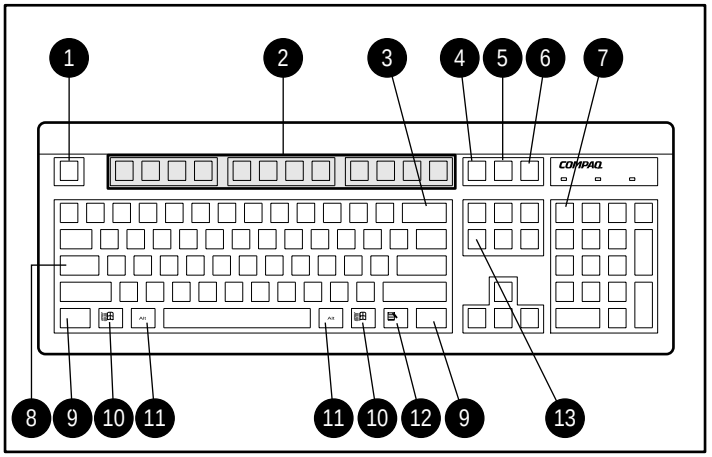


Figure 1-4. Identifying Special Function keys

Table 1-4
Special Function Keys

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

Continued

Special Function Keys *Continued*

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

*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 4.0.

Table 1-5
Key Combinations

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

Keyboard Lights

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

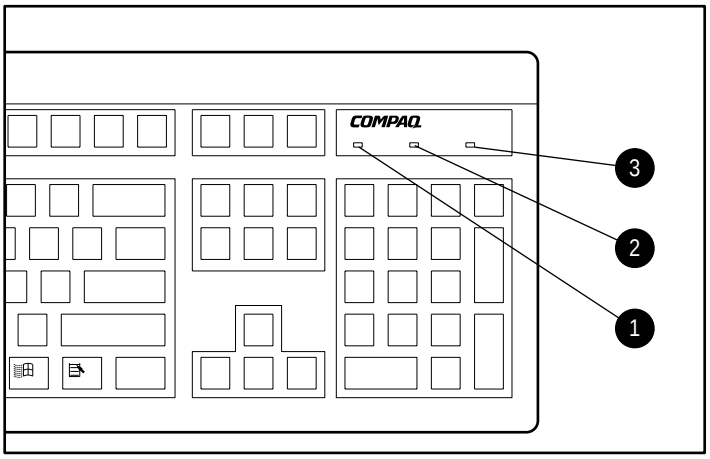


Figure 1-5. Keyboard lights

Table 1-6
Keyboard Lights

Ref.	Description	Function
❶	Num Lock	When Num Lock is enabled (light is on), the numeric keypad is activated.
❷	Caps Lock	When the 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.

Chapter 2
Compaq Setup and Diagnostic Software

Your Compaq Professional Workstation AP400 comes with Compaq setup and diagnostic software (F10 Setup). This software includes Compaq Utilities preinstalled on a hard drive partition and ROM BIOS (Read Only Memory Basic Input/Output System). This chapter explains how to access the Compaq Utilities menu, describes the options available in Compaq Utilities, and discusses the ROM BIOS.

If you have reformatted your hard drive and removed the Compaq Utilities partition, you can reinstall it by using the Compaq SmartStart for Workstations CD, or you can download Setup and User Diagnostics from the 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.*

Accessing the Compaq Utilities Menu

To access the Compaq Utilities menu:

1. Turn on or restart the workstation.

   NOTE: Do not restart your workstation while in Windows NT. Instead, exit Windows NT by clicking *Start, Shut Down, Restart the computer.*

2. When you see the words **"F10=Setup"** in the bottom-right corner of the screen, press **F10.** You have approximately two seconds to press **F10** or you must restart the workstation.

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

The Compaq Utilities menu consists of the following choices:

- Computer Setup
- Computer Checkup (TEST)
- View System Information (INSPECT)
- Create a Diagnostics Diskette
- Manage Diagnostics Partition
- Exit from this Utility

Computer Setup

Use Computer Setup in the following instances:

- To verify configuration parameters when resolving problems.
- To get an overview of the workstation's hardware.
- To modify settings for graphics, processor, memory, audio, storage, communications, and input devices.
- To enable or disable removable media drive boot ability.
- To enable or disable removable media drive write control.
- To enable or disable the serial or parallel ports.
- To resolve errors when a system configuration error is detected during the Power-On Self-Test (POST) and is not automatically fixed by POST.
- To change factory default settings.
- To change the system boot order (refer to the setup help file for more information).
- If you add new options, such as a network interface controller upgrade.

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

Security Management

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

- To set or change your Power-on Password.
- To set or change the Setup (administrator) Password, which protects the workstation configuration.
- To password-protect access to your system after turning on the workstation.
- To set or change QuickLock/QuickBlank features.

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

Power Management

Use the Power Management feature of Computer Setup in the following instances:

- To create a custom power conservation level.
- To enable or disable power management.
- To change component time-out periods.

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

Computer Checkup (TEST)

Use Computer Checkup (TEST) in the following instances:

- To determine if all devices are recognized by the system and functioning properly. Running TEST is optional, but recommended, after you install or connect a new device.
- To save, print, or display the information generated by TEST. It is recommended that you run TEST and have the printed report available before placing a call to the Compaq Customer Support Center.
- To assist your Compaq authorized dealer, reseller, or service provider in analyzing the system by allowing the service provider to reproduce the same environment on another workstation for testing.

To run Computer Checkup (TEST):

1. Turn on only the external devices that you wish to test. You may wish to leave the printer connected to log error messages.
2. Access the Compaq Utilities menu.
3. From the Compaq Utilities menu, select *Computer Checkup (TEST).*
4. When the test option menu appears, select the option to view the device list.
5. Verify that TEST correctly detected the devices installed.

   NOTE: This utility 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 6.
   - ❑ If the list is incorrect, be sure that any new devices are installed properly. If you do not find an installation problem, call your Compaq authorized dealer, reseller, or service provider.

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

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

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

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

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

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

8. Exit to the Compaq Utilities menu.

View System Information (INSPECT)

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

- To view information about the system once it has been configured.
- To save, print, or display the information generated by INSPECT. It is recommended that you run INSPECT and have the printed report available before placing a call to the Compaq Customer Support Center.
- To assist your Compaq authorized dealer, reseller, or service provider in analyzing the system by allowing the service provider to reproduce the same environment on another workstation for testing.

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

- Contents of the operating system startup files
- Current memory configuration
- ROM versions
- Type of processor and coprocessor
- Types of drives installed
- Active printer and communications interfaces
- Type of modem installed
- Graphics details

Create a Diagnostics Diskette

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

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

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

2. Press **F10** as soon as you see the words **"F10=Setup"** in the bottom-right corner of the screen.
3. If prompted, select the desired language.
4. Press **Enter** to bypass the Welcome to Compaq Utilities screen.
5. From the Compaq Utilities menu, select *Create a Diagnostics Diskette.* One diagnostic and two setup diskettes will be created.

   NOTE: The Diagnostics and Setup diskettes can also be created by downloading the latest version from the Compaq website at http://www.compaq.com.

Manage a Diagnostics Partition

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

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

Exit from This Utility

Use this option to exit the Compaq Utilities menu.

ROM BIOS

Your workstation contains a set of software called Basic Input/Output System (BIOS), which is stored in Read Only Memory (ROM) on the system board. The BIOS contains a set of routines for Power-On Self-Test (POST) and accessing hardware specific information. The ROM is 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. Detect and spin up all drives.
4. Boot from, in sequence, either a CD, a diskette, or the hard drive.

Runtime Services

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

Upgrading the ROM BIOS

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 given by the ROMPaq software.

Boot Block ROM

The Boot Block ROM cannot be upgraded.

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

Chapter 3
Security Features

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

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

Table 3-1
Security Features Summary

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

Continued

Security Features *Continued*

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

Password Security

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

Power-on Password

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

IMPORTANT: The Power-on Password is established for the first time using the Computer Setup utility. Once established, the password cannot be changed or deleted using the Setup utility. To change or delete the Power-on Password, see “Changing a Power-on Password” or “Deleting a Power-on Password” in this chapter.

To establish a Power-on Password:

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 turn the workstation off, then on again to access the utility.

3. Press **Enter** to bypass the welcome screens and display the main menu.
4. From the main menu, select *Computer Setup* and press **Enter**.
5. From the Computer Setup main menu, select the *Security Management feature* under Built-In Devices.
6. Locate the Power-on Password option and follow the instructions provided to enable it.
7. Save the configuration and exit the utility.

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

Entering a Power-on Password

To enter the Power-on Password:

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

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

Changing a Power-on Password

To change the Power-on Password:

1. Turn on the workstation. (If the workstation is already on, you must turn it off and then on again.)
2. When the key icon ( ) appears, type your current password, then a slash (/) or alternate delimiter character, your new password, another slash(/) or alternate delimiter character, and your new password:

   current password/new password/new password

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

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

Deleting a Power-on Password

To delete the Power-on Password:

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

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

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

National Keyboard Delimiter Characters

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

Table 3-2
National Keyboard Delimiter Characters

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

*Bosnia-Herzegovina, Croatia, Slovenia, and Yugoslavia

Clearing a Power-on Password

To clear the Power-on Password:

1. Turn off the workstation. Disconnect power cord from the grounded AC outlet and from the power connector on the rear of the workstation.
2. Remove the following components:
   - ❏ workstation cover
   - ❏ expansion board bracket
3. Locate the SW1 switch on the system board.

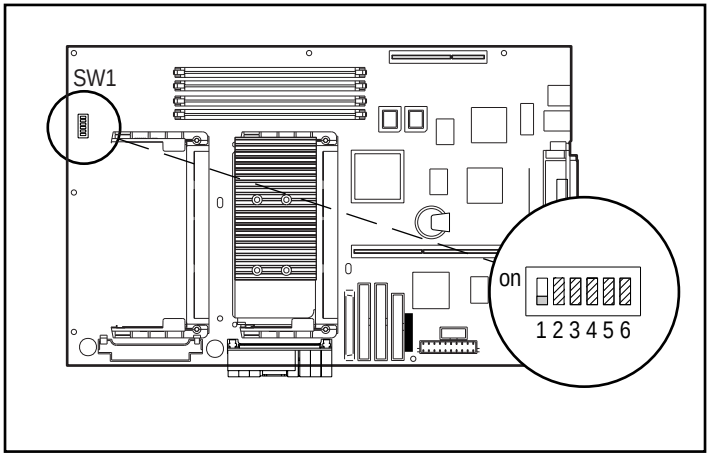


Figure 3-1. Locating the default SW1 switch

4. On SW1, move switch 1 to the ON position (currently shown in the OFF position).

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

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

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

6. Restart the workstation to erase the password from system memory.

NOTE: Clearing the Power-On Pasword will also clear the Setup Password. Be sure to reestablish your Setup password after you clear the Power-on Password.

7. Turn off the workstation once more. Disconnect the power cord from the grounded AC outlet and from the power connector on the rear of the workstation.
8. Remove the expansion board bracket to access SW1.
9. On SW1, return switch 1 to its original default (OFF) position.
10. Reassemble the workstation.
11. Establish a new Power-on Password and Setup Password, if desired.

Setup Password

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

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

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

To establish a Setup Password through Computer Setup:

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 turn the workstation off, then on again to access the utility.

3. Press **Enter** to bypass the welcome screens and display the main menu.
4. From the main menu, select *Computer Setup* and press **Enter**.
5. From the Computer Setup main menu, select *the Security Management feature* under Built-In Devices.
6. Locate the Setup Password option and follow the instructions on the screen to enable it.
7. Save the configuration and exit the Computer Setup utility.

Entering the Setup Password

To enter the Setup Password:

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 turn the workstation off, then on again to access the utility.

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

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

Changing a Setup Password

To change the Setup Password:

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 turn the workstation off, then on again to access the utility.

3. Enter the current Setup Password.

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

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

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

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

Deleting a Setup Password

To delete the Setup Password:

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 turn the workstation off, then on again to access the utility.

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

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

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

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

Clearing a Setup Password

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

To clear the Setup Password:

1. Turn off the workstation. Disconnect the power cord from the grounded AC outlet and from the power connector on the rear of the workstation.
2. Remove the following components:
   - ❏ workstation cover
   - ❏ expansion board bracket
3. Locate the SW1 switch on the system board.

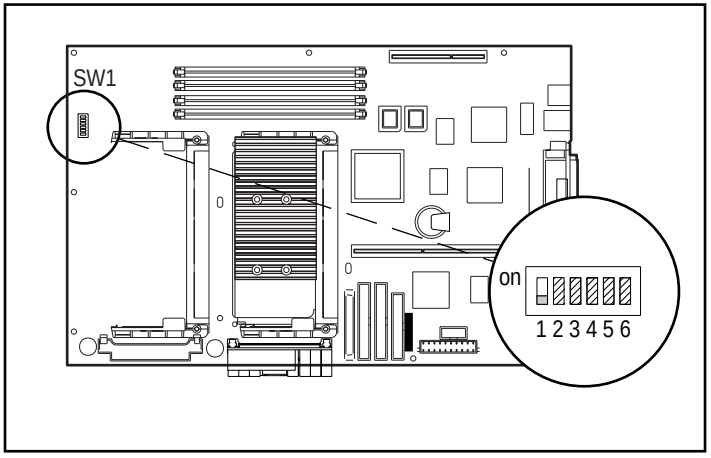


Figure 3-2. Locating the default SW1 switch

4. On SW1, move switch 1 to the ON position (currently shown in the OFF position).

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

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

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

6. Restart the workstation to erase the password from system memory.

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

7. Turn off the workstation once more. Disconnect the power cord from the grounded AC outlet and from the power connector on the rear of the workstation.
8. Remove the expansion board bracket to access SW1.
9. On SW1, return switch 1 to its original default (OFF) position.
10. Reassemble the workstation.
11. Establish a new Setup Password and Power-on Password, if desired.

Advanced Security Management

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

- Disable removable media boot ability
- Disable removable media write ability
- Disable serial port

- Disable parallel port
- QuickLock/QuickBlank
- Smart Cover Sensor

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

Disabling Diskette Boot or Diskette Write

IMPORTANT: If you disable the Diskette Boot feature, the FailSafe Boot Block ROM will ignore the disabled feature to accommodate a 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):

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 turn the workstation off, then on again to access the utility.

3. Press **Enter** to bypass the welcome screens and display the main menu.
4. From the main menu, select *Computer Setup,* then press **Enter**.
5. From the Computer Setup main menu, select the *Security Management feature* under Built-In Devices.
6. Select *Storage.*
7. Under Removable Media, select the function you want to disable.
8. Save the configuration and exit the utility.
9. Restart the workstation.

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

Disabling a Serial Port or Parallel Port

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

1. Turn on the workstation.
2. When 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 turn the workstation off, then on again to access the utility.

3. Press **Enter** to bypass the welcome screens and display the main menu.
4. From the main menu, select *Computer Setup*, then press **Enter.**
5. From the Computer Setup main menu, select *Communications* under Built-In Devices.
6. To disable a Serial Port:
   - ❑ Click on the down arrow of Available Serial Ports.
   - ❑ Under Settings, select *Disable for Serial Port 1* or *Serial Port 2,* whichever you want to disable.
7. To disable the Parallel Port:
   - ❑ Under Settings, click the down arrow to locate Parallel Port.
   - ❑ Select Disable.
8. Save the configuration and exit the utility.
9. Reboot the workstation.

Enabling QuickLock/QuickBlank

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

- Disable the keyboard and mouse interface (QuickLock)
- Blank the screen from within an application (QuickBlank)

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

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

1. Turn on the workstation.
2. When 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 turn the workstation off, then on again to access the utility.
3. Press **Enter** to bypass the welcome screens and display the main menu.
4. From the main menu, select *Computer Setup*, then press **Enter.**
5. From the Computer Setup main menu, select the *Security Management feature* under Built-In Devices.
6. Select *Enable QuickLock of the Keyboard* to enable the QuickBlank the Screen When Locked and Initiate QuickLock When entering Energy Saver Modes.

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

7. Check the function desired by clicking in the appropriate box.
8. Save the configuration and exit the utility.

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

Disabling the Keyboard and Mouse Interface

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

Enabling the Keyboard and Mouse Interface

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

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

Smart Cover Sensor

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

Table 3-3
Smart Cover Sensor Protection Levels

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

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

- **SW1-S1 (Switch 1 of Switch Block 1)—**Refer to the hood label affixed to the underside of the workstation cover if you need help locating the switch on the system board.
- **The Setup Password—**Refer to "Setup Password" or "Clearing a Setup Password" in this chapter to enable or disable the Setup Password.
- **The Smart Cover Sensor setting—**Three settings are possible: Disabled, Notify User, and Setup Password. Refer to "Setup Password" in this chapter to select the desired setting.

Refer to Appendix F for a summary of the Smart Cover Sensor functions based on the above three elements.

Cable Lock Provision

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

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

To install the security bracket:

1. Separate bracket A and bracket B by bending the metal back and forth where the two pieces join.

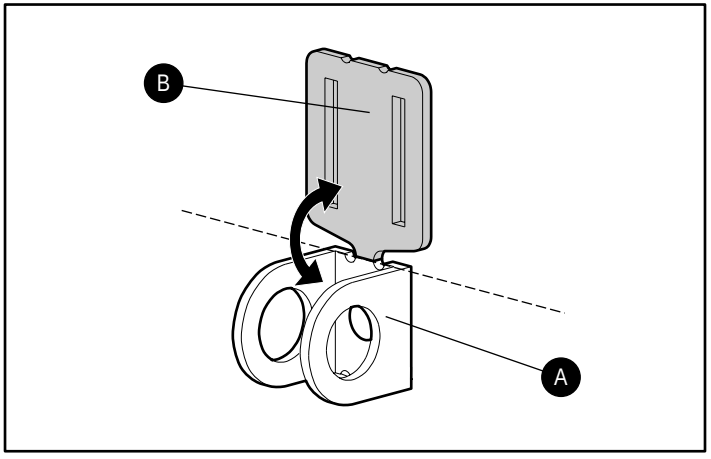


Figure 3-3. Separating the security brackets

2. Insert the tab on bracket A into the notch on the rear of the workstation until the bracket is positioned flat against the workstation cover.
3. Align the hole on the flat portion of bracket A with the screw hole on the workstation cover.
4. Install the retaining screw provided in the cable lock kit.

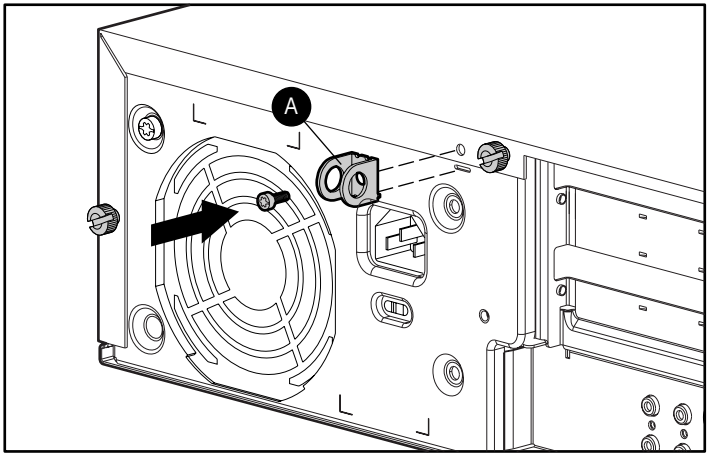


Figure 3-4. Installing bracket A

5. Place bracket B over bracket A to cover the retaining screw.
6. Install a padlock (not provided) through bracket A to inhibit access to the interior of the workstation. Or, to inhibit access to the interior of the workstation and secure the workstation to a fixed object, install a cable lock (not shown).

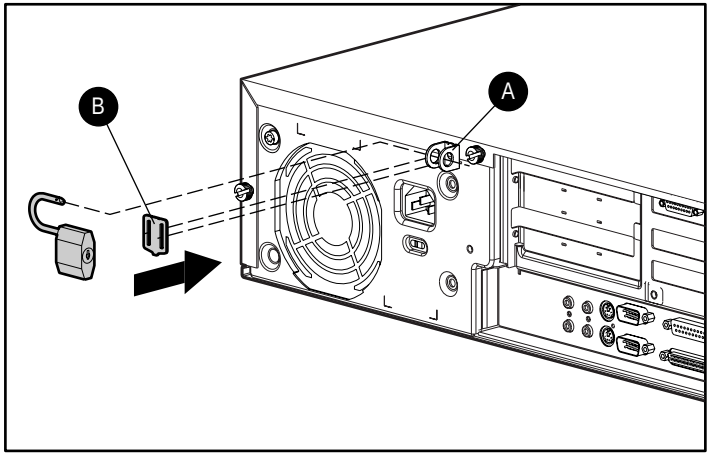


Figure 3-5. Securing the workstation with a padlock

Chapter 4
Intelligent Manageability

Your workstation is equipped with the following Intelligent Manageability components:

- Configuration Management
- Asset Management
- Compaq Insight Manager and Insight Management Agents

Configuration Management

Configuration Management features include:

- Upgrading (flashing) the ROM
  - Local
  - Remote
- FailSafe Boot Block ROM
- Remote Security Management
- Remote Wakeup and Remote Shutdown
- Establishing Power Management Settings
- Advanced Configuration and Power Interface (ACPI) capable
- Enhanced Support Software CD and support from Compaq website

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

Upgrading the ROM

Your workstation comes with reprogrammable ROM. 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. If you need or want to upgrade your ROM, you may:

- Order an upgraded ROMPaq diskette from Compaq.
- Order the *Compaq Support Software CD Kit.*
- Download the latest ROMPaq images from the Compaq website (http://www.compaq.com) in Technical Help and Services, under Downloadables.

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

Local ROM Upgrade

To upgrade the ROM after you receive or download a ROMPaq diskette, follow these steps:

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

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

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

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

Remote ROM Upgrade

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

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

Remote ROM Upgrade is performed in two stages:

1. System administrator uses the Remote Management Setup software on a centralized management console to prepare a workstation ROMPaq file.
2. System administrator uses a PC LAN management product, such as Microsoft SMS, Intel LANDesk Manager, or Symantec Norton Administrator for Networks, to distribute and execute the file over the network to remote workstations.

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

This Remote ROM Upgrade is available as a downloadable SoftPaq on the Compaq website (http://www.compaq.com) in Technical Help and Services, under Downloadables.

FailSafe Boot Block ROM

The FailSafe Boot Block ROM allows for system recovery in the unlikely event of a ROM upgrade failure. For example, if a power failure occurs during a ROM upgrade. The Boot Block ROM 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 System ROM Recovery diskette, which will program the system ROM with a valid image. The Flash Recovery diskette is a SoftPaq downloadable from the Compaq website (http://www.compaq.com) in Technical Help and Services, under Downloadables.

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

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

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

1. Remove any diskettes from the diskette drive and turn off the power.
2. Insert the System ROM Recovery diskette into the diskette drive.
3. Turn on power to the system.

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

4. Enter the Setup Password.

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

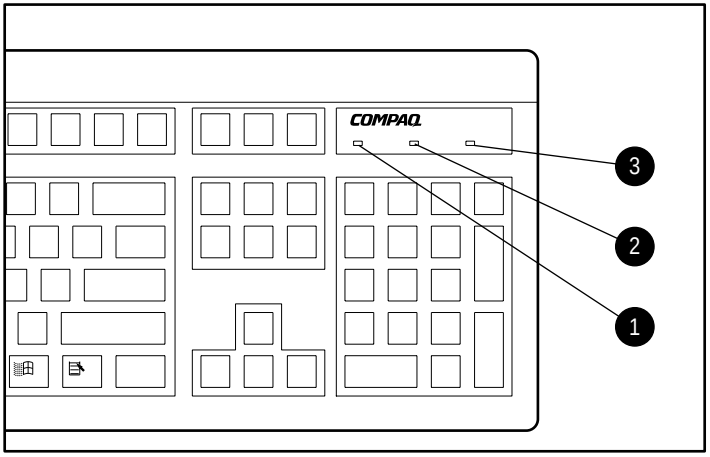


Figure 4-1. Keyboard lights

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

Table 4-1
Keyboard Lights

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

Continued

Keyboard Lights *Continued*

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

Remote Security Management

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

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

- ❑ Wakeup and Shutdown
- ❑ QuickLock and QuickBlank
- ❑ Serial and Parallel Interfaces
- ❑ Administrator Password
- ❑ Smart Cover Sensor
- ❑ Asset Tag
- ❑ QuickLock on Suspend
- ❑ Network Server Mode
- ❑ Diskette Boot and Diskette Write

Remote Security Management is performed in two stages:

1. System administrator uses the Remote Management Setup software on a centralized management console to define the security parameters.
2. System administrator uses a PC LAN management product to distribute the settings over the network to remote Compaq Workstation personal workstations.

This Remote Management Setup software is available as a SoftPaq on the Compaq website (http://www.compaq.com) in Technical Help and Services, under Downloadables.

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

Remote Wakeup and Remote Shutdown

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

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

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

The Remote Management Setup software is available as a SoftPaq on the Compaq website (http://www.compaq.com) in Technical Help and Services, under Downloadables.

Establishing Power Management Settings

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

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 AP400 ships standard with the ACPI hardware, you will be able to utilize 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 in order to take advantage of the ACPI features.

Enhanced Compaq Support Software CD Kit and Support from the Compaq Website

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

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

- Microsoft Windows NT Workstation 3.51
- Microsoft Windows NT Workstation 4.0
- Microsoft Windows 95
- Microsoft Windows 98

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 contain the latest device drivers, utilities, and ROM images needed to run your workstation.
- You can download the drivers and utilities from the Compaq website (http://www.compaq.com) in Technical Help and Services, under Downloadables.

  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.

Compaq Integrated Software

The *Compaq Support Software CD Kit* and the Compaq website (http://www.compaq.com) include bundles of individual drivers or an appropriate driver ready for automated installation. You can use these drivers to quickly and easily install the correct Compaq Professional Workstation AP400 device drivers and other software required for top performance.

Asset Management

Compaq Diagnostics for Microsoft 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
- Windows version

Using Compaq Diagnostics for Windows NT

To use Compaq Diagnostics for Windows NT, follow these steps:

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

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

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

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

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

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

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

5. To print the information, click *File, Print.*

6. Select one of the following options:

   - ❑ Detailed Report (All Categories)
   - ❑ Summary Report (All Categories)
   - ❑ Current Category.

7. Click *OK* to print the report you selected.

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

Compaq Insight Manager and Insight Management Agents

Using the industry-standard Simple Network Management Protocol (SNMP) found in Windows NT Workstation, Compaq has continued the migration of management tools from servers to desktops by enhancing Compaq Insight Manager. Compaq Insight Manager allows the LAN administrator to remotely view asset control data, configuration data, memory change alerts, NIC performance data, and contact information. The tools also provide access to the fault management features of the Compaq Professional Workstation AP400.

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

Chapter 5
Network Communications

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

> **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 Intel 10/100Mbps Integrated Autosensing Ethernet is a PCI bus mastering, dual speed 10BaseT, and 100BaseTX controller that will automatically detect network connection speed and adjust accordingly. The controller supports full duplex Ethernet, allowing two-way transmission between nodes for up to 20 or 200 Mbits/sec aggregate bandwidth.

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

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.

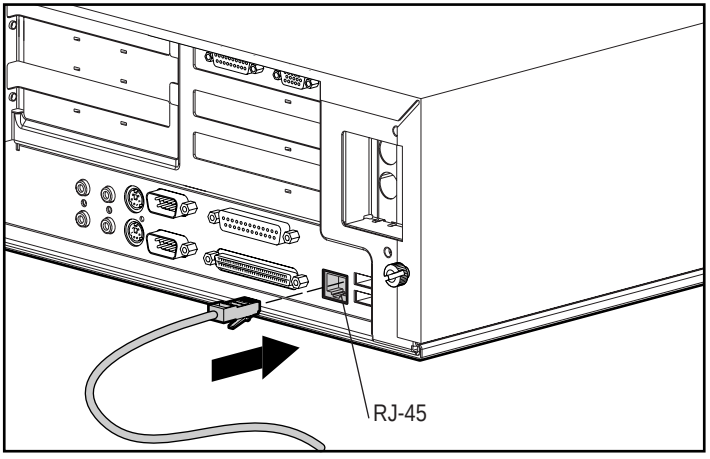


Figure 5-1. Attaching the network cable to the RJ-45 connector

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 Drivers

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

Changing the Default Configuration

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

Chapter 6
CD-ROM Drive and PremierSound Audio System

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

Using the Tray-Load CD-ROM Drive

To insert a CD, place the disk into the tray as shown below.

NOTE: If the computer is in tower position, it will be necessary to use the CD clamps (not shown). Extend the clamps and insert the CD, angling it slightly.

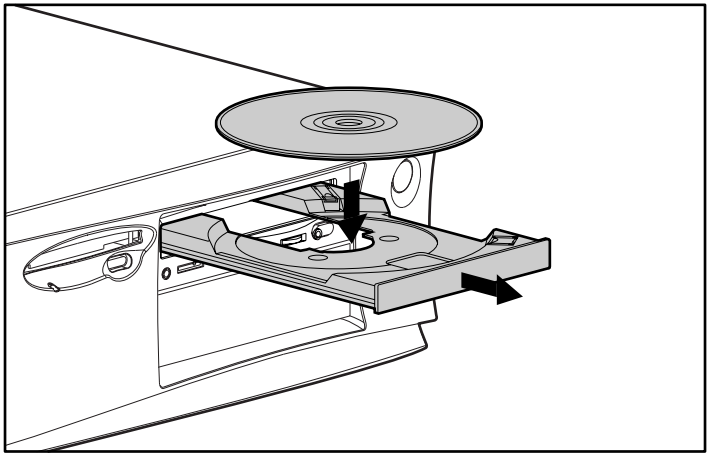


Figure 6-1. Inserting a CD into a CD-ROM drive

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

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

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

CAUTION: Do not apply labels to CDs. The presence of a label will cause the CD not to be balanced and may cause either inconsistent operation or failure of the drive.

Using CD-ROM Software

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

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

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

- How much hard disk space will this program require? Do you have enough disk space?
- Will you activate the disc from Windows NT or from the system prompt?

- Have you connected any special devices this program requires, such as a joystick?
- Do you have the required information (such as serial number) available to answer any questions during the setup program?

Using Audio Compact Discs

To play an audio CD, follow these steps:

1. Select *Programs* from the Start button.
2. Then select *Multimedia* from the Accessories menu.
3. Click *CD Player,* found in the Accessories group box, to control audio compact disc play.

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

CD-ROM Drive Precautions

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

- Do not move the drive during operation. This may cause it to malfunction during reading.
- Avoid exposing the drive to sudden changes in temperature, as condensation may form inside the unit. If the temperature suddenly changes while the drive is on, wait at least one hour before you turn off the power. If you operate the unit immediately, it may malfunction while reading.
- Avoid placing the drive in a location that is subject to high humidity, extreme temperatures, mechanical vibration, or direct sunlight.
- Clean the panel and controls with a soft, dry cloth or a soft cloth lightly moistened with a mild detergent solution. Never spray cleaning fluids directly on the unit.

- Avoid using any type of solvent, such as alcohol or benzene, which may damage the finish.
- If any object or liquid falls into the slot, immediately unplug the workstation and have it checked by an authorized Compaq service provider.

PremierSound Audio System

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

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

IMPORTANT: Do not remove the ESS 1869 driver from the Drivers window in the Control Panel. Follow the instructions below.

1. From the Control Panel in Windows NT, select Devices.
2. From the Devices window, select the *AudioDrive* device.
3. Select the *Stop* button to stop the AudioDrive device.
4. Select the *Startup* button.
5. Select *Disabled* as the Startup Type for the AudioDrive.
6. Select *OK.*
7. Close the Devices window.
8. Restart the workstation for the changes to take effect.
9. Proceed with the installation process for your upgrade audio controller board.

Chapter 7
Hardware Upgrade Preparations

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

To install the following upgrades or optional equipment, see the related chapter.

- Memory (Chapter 8)
- Drives (Chapter 9)
- Expansion Boards (Chapter 10)
- Processors (Chapter 11)

Installation Sequence

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

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

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

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

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

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Open the workstation by removing its outside cover and front bezel. Refer to the sections “Removing the Workstation Cover” and “Removing the Front Bezel” in this chapter for instructions.
3. Install any optional equipment (ISA or PCI expansion board, or Accelerated Graphic Port (AGP) graphics controller, processor upgrade, memory, or drive). Refer to the applicable chapters in this manual or the documentation provided with the optional equipment for instructions.
4. Replace the front bezel and workstation cover.
5. Reconnect the power cord to the back of the workstation, and plug in the power cord to a grounded AC outlet.
6. Turn on the monitor, workstation, and any devices you installed.
7. Reconfigure the workstation, if necessary. Refer to Chapter 2 for instructions.
8. Test the workstation (optional) using the TEST utility.

Reconfiguring the Workstation

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

Run the Computer Setup utility *after* you complete the installation. To configure in Windows NT, utilize 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. Refer to Chapter 2 for more information on Computer Setup.

Removing the Workstation Cover

To remove the workstation cover, follow these steps:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Refer to the following illustrations to remove the workstation cover.

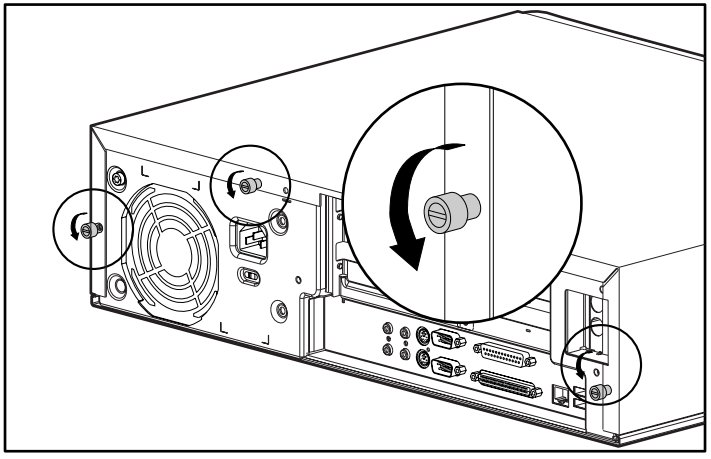


Figure 7-1. Loosening the thumbscrews

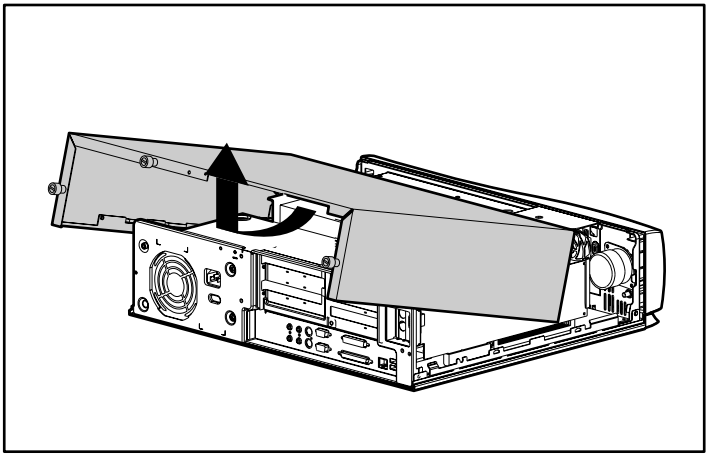


Figure 7-2. Removing the workstation cover

NOTE: The hood label located on the underside of the workstation cover provides information on changing switch settings, and installing additional DIMMs.

Removing the Front Bezel

To remove the front bezel, follow these steps:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Remove the workstation cover.
3. Refer to the following illustrations to remove the front bezel.

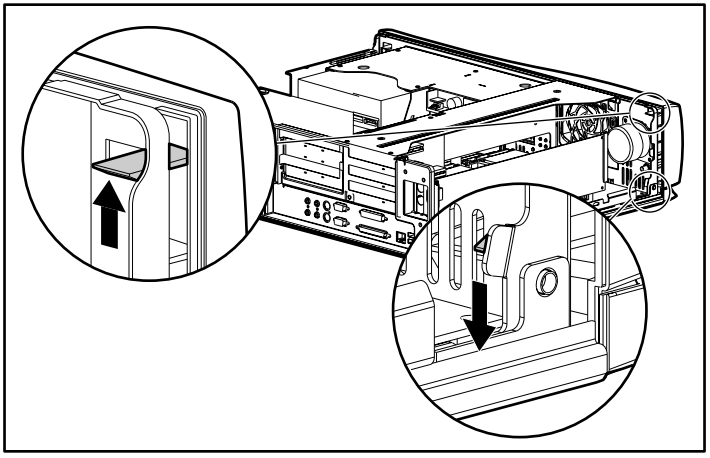


Figure 7-3. Locating the front bezel release latches

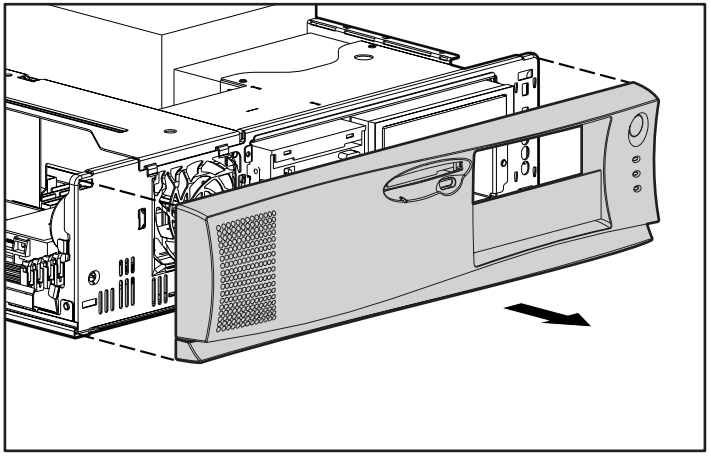


Figure 7-4. Removing the front bezel

Identifying Internal Components

The following illustration and table identifies the internal components of your workstation.

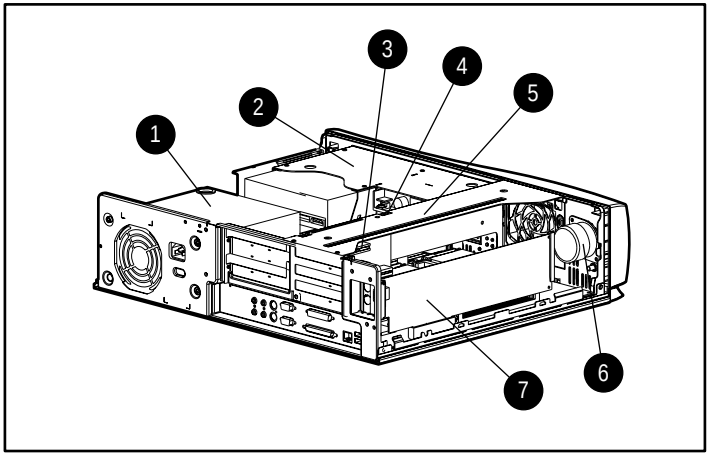


Figure 7-5. Identifying internal components

Table 7-1
Internal Components

Ref.	Component
❶	Power Supply
❷	Drive Cage
❸	PCI/ISA Slots
❹	Expansion Board Bracket
❺	Smart Cover Sensor
❻	Speaker
❼	Accelerated Graphics Port (AGP) Graphics Controller (available on select models)

Removing the Expansion Board Bracket

To remove the expansion board bracket, follow these steps:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Remove the workstation cover.

CAUTION: The power supply in the Compaq Professional Workstation AP400 contains an auxiliary power section. Be sure the power switch is off and the unit is unplugged before removing the expansion board bracket in the following step.

3. Refer to the following illustration to remove the expansion board bracket.

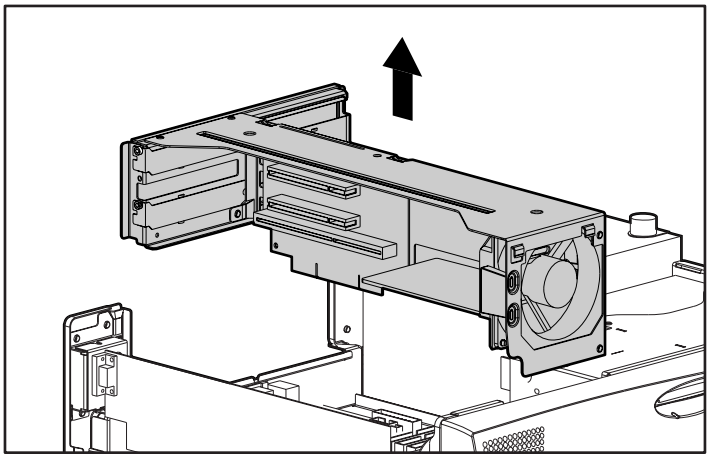


Figure 7-6. Removing the expansion board bracket

NOTE: After removing the expansion board bracket, rest it upside down on a flat surface.

IMPORTANT: If the expansion board bracket is not seated properly, the Power On/Off LED will display a steady amber light. Disconnect the power cord and **properly** seat the expansion board bracket. Then, reconnect the power cord and turn on the workstation.

Removing the System Board with Tray

To remove the system board with tray, follow these steps:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Disconnect all cables from the system board, and any external device cables from the rear panel.
3. Remove the following components:
   - ❑ workstation cover
   - ❑ expansion board bracket

4. Refer to the following illustration to remove the system board with tray.

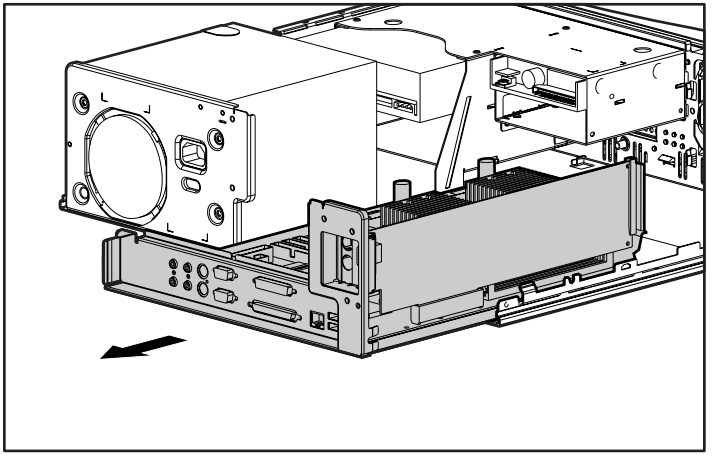


Figure 7-7. Removing the system board with tray

Identifying System Board Components

The following illustration and table identifies the internal system board components of your workstation.

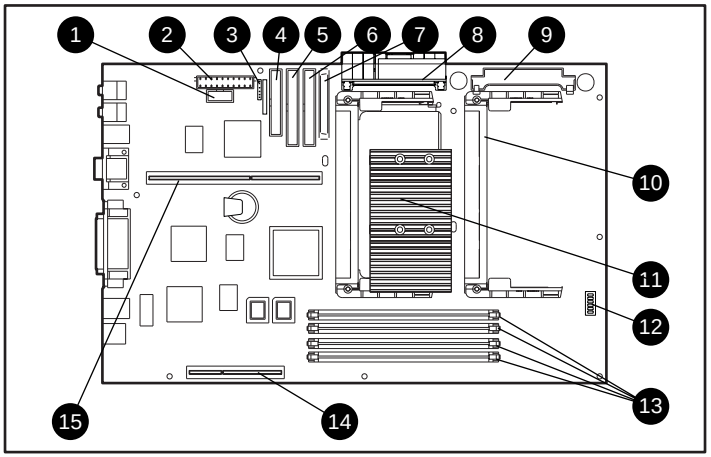


Figure 7-8. Identifying system board components

Table 7-2
System Board Components

Ref.	Component
❶	Power Switch and LED Header
❷	Power Connector
❸	External Battery Jumper
❹	Diskette Drive Connector
❺	Secondary IDE Connector
❻	Primary IDE Connector
❼	SCSI Connector
❽	Primary Processor Power Module

Continued

System Board Components *Continued*

Ref.	Component
❾	Secondary Processor Power Module Connector
❿	Secondary Processor Slot
⓫	Primary Processor
⓬	SW1 Switch
⓭	DIMM Sockets 1-4
⓮	AGP Graphics Controller Connector
⓯	Expansion Board Connector

Chapter 8
Memory Upgrades

This chapter explains how to install additional memory.

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

Installing Additional Memory

Your workstation supports Registered 100-MHz Error Checking and Correcting (ECC) SDRAM dual inline memory modules (DIMMs). Additional DIMMs (32-MB, 64-MB, 128-MB, or 256-MB) are available to upgrade the memory. The workstation has four DIMM sockets located on the system board that support up to a maximum of 1 GB.

The following figure illustrates the physical location of all DIMM sockets. Note that DIMMs do not need to be installed in pairs, and can be installed in any of the available DIMM sockets.

IMPORTANT: Prior to installing additional DIMMs, read "Important Guidelines for DIMM Installation" in the following section.

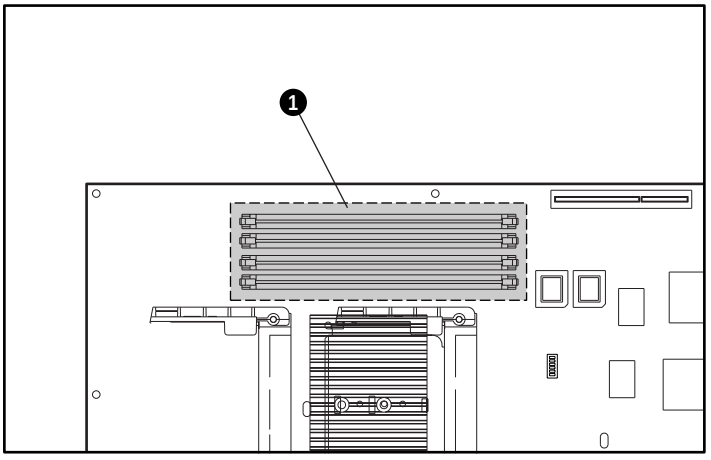


Figure 8-1. Overview of DIMM sockets

NOTE: The DIMM sockets are numbered in sequence from 1-4. DIMM socket 1 is located closest to the center of the system board, and DIMM socket 4 is located closest to the edge of the system board.

Important Guidelines for DIMM Installation

When installing DIMMs, you **MUST** follow the following guidelines:

- Use only 32-, 64-, 128-, or 256-MB, Registered 100-MHz Error Checking and Correcting (ECC) SDRAM DIMMs.
- DIMMs must have a 4 KHz refresh rate.
- **DO NOT INSTALL DIMMS THAT DO NOT SUPPORT ERROR CHECKING AND CORRECTING (ECC).**

- A DIMM can be installed one way only. Be sure to match the two *key slots* on the DIMM with the tab on the DIMM socket. Push the DIMM down into the DIMM socket, ensuring that it is fully inserted and properly seated.
- When upgrading, do not exceed 1 GB total. Upgrades exceeding 1 GB will cause the system to halt.

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

Installing DIMM Modules

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

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

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

To install a memory module, follow these steps:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Remove the workstation cover.
3. Remove the AGP graphics controller (if necessary).

4. Refer to the following illustration to install a DIMM module.

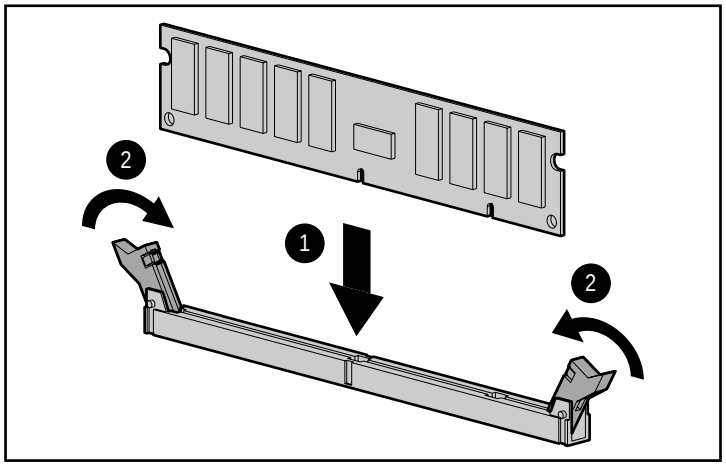


Figure 8-2. Installing a DIMM module

NOTE: To remove a memory module, reverse the above procedure.

Chapter 9
Drives

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

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

Installing Additional Drives

The Compaq Professional Workstation AP400 supports up to five drive bays (see Figure 9-1):

- **Bay 1—**supports a third-height device. A standard 3.5-inch diskette drive is shipped in bay 1.
- **Bay 2 (Internal)—**supports a third-height (1.0”) hard drive.
- **Bay 3—**supports a third-height (1.0”) or half-height (1.6”) device. A CD-ROM drive is shipped in bay 3.
- **Bay 4—**supports a half-height device. An optional diskette drive, CD-ROM drive, or tape drive can be installed in bay 4.
- **Bay 5 (Internal)—**supports a third-height (1.0”) or half-height (1.6”) hard drive. A 1.0” HD is shipped standard in bay 5.

Your workstation ships with an Ultra ATA (IDE) or Wide-Ultra SCSI hard drive. Hard drives are shipped in various bay configurations, however, if you install a 1.6-inch hard drive, it should be installed in bay 5.

NOTE: If you purchase an optional hard drive bracket, you can install the 1.0-inch hard drive in bay 4.

NOTE: Additional hard drives may be installed in bays 3 and 4, but these positions are more often used for devices requiring user access.

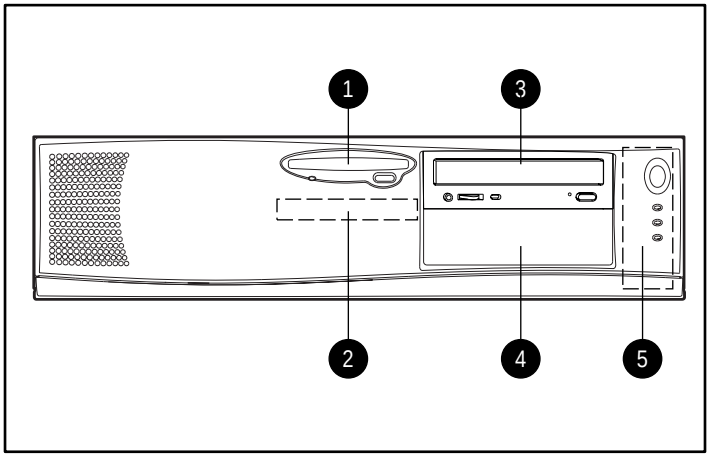


Figure 9-1. Identifying drive configurations

Removing a Blank Drive Bezel

To remove a blank drive bezel, follow these steps:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Remove the workstation cover and front bezel.
3. Refer to the following illustration to remove a blank drive bezel.

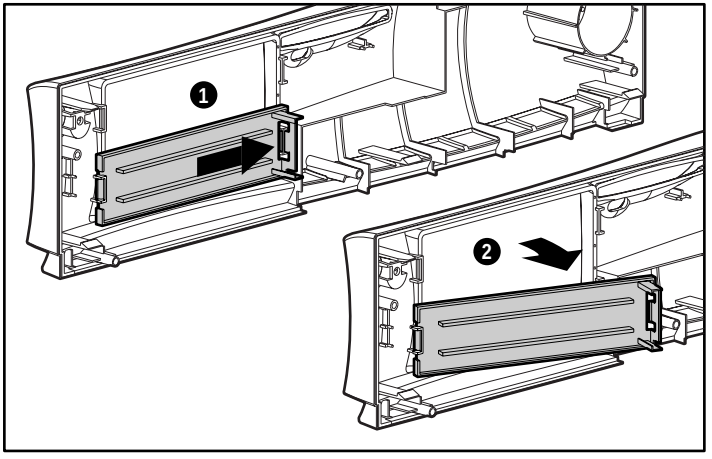


Figure 9-2. Removing a drive bezel

Removing the EMI Shield

Your workstation may come with a preinstalled EMI shield. You must remove this shield prior to installing an optional drive in bay 4.

To remove the EMI shield, follow these steps:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Remove the workstation cover and front bezel.
3. Remove hard drive from bay 5 (if installed.)
4. Refer to the following illustration to remove the EMI shield.

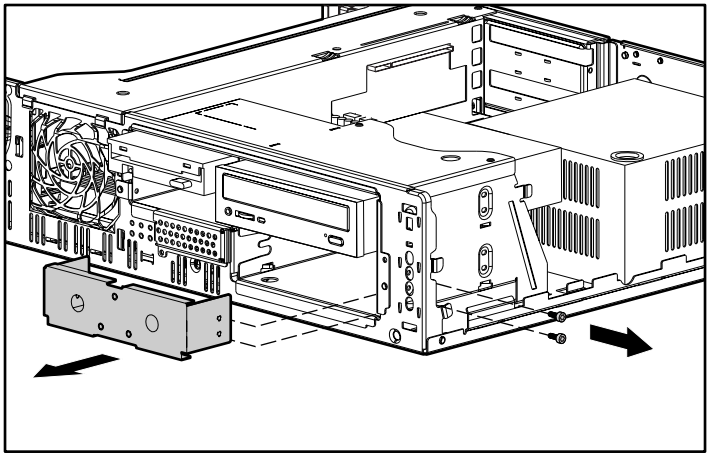


Figure 9-3. Removing the EMI shield

NOTE: If you decide to remove the optional drive you installed (in bay 4), you must reattach the EMI shield.

Installing a 1.6-inch Hard Drive in Bay 5

The 1.6-inch hard drive should be installed in bay 5. Bay 5 is an internal bay (bracket) located to the right of the drive cage.

> **NOTE:** If you purchase an optional hard drive bracket, you can install the 1.0-inch hard drive in bay 4.

To install a 1.6-inch hard drive, follow these steps:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Remove the workstation cover.
3. Refer to the following illustrations to install a 1.6-inch hard drive in bay 5.

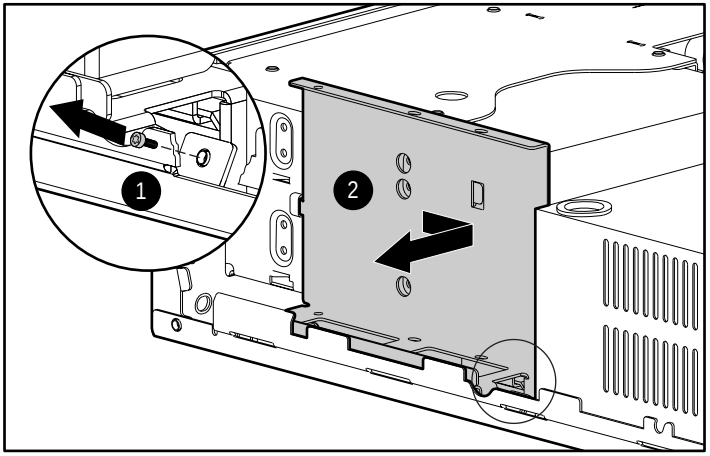


Figure 9-4. Removing the hard drive bracket (bay 5)

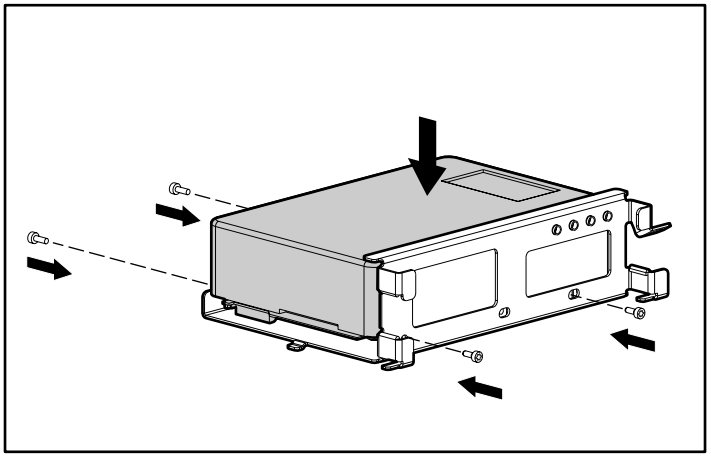


Figure 9-5. Installing a 1.6-inch hard drive in the hard drive bracket

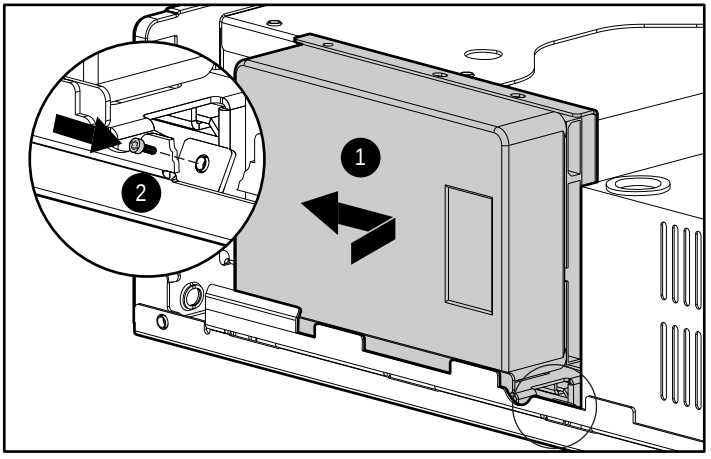


Figure 9-6. Installing the hard drive/bracket assembly

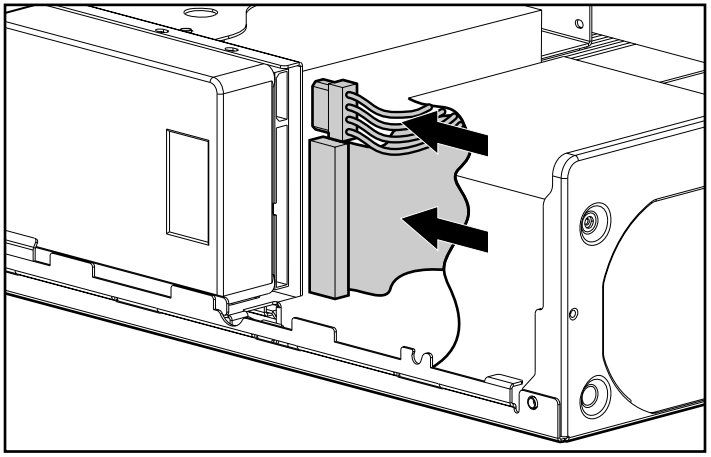


Figure 9-7. Connecting the signal and power cables to a 1.6-inch half-height hard drive

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

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

To install an optional diskette, CD-ROM, or tape drive, follow these steps:

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

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Remove the following components:
   - ❑ workstation cover
   - ❑ front bezel
   - ❑ blank bezel
   - ❑ EMI shield
   - ❑ hard drive from bay 5 (if installed)
3. Refer to the following illustrations to install an optional diskette, CD-ROM, or tape drive.

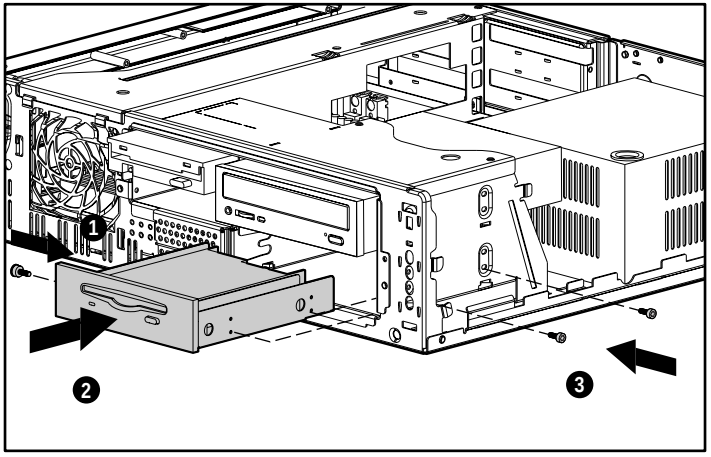


Figure 9-8. Installing an optional 5.25-inch drive

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

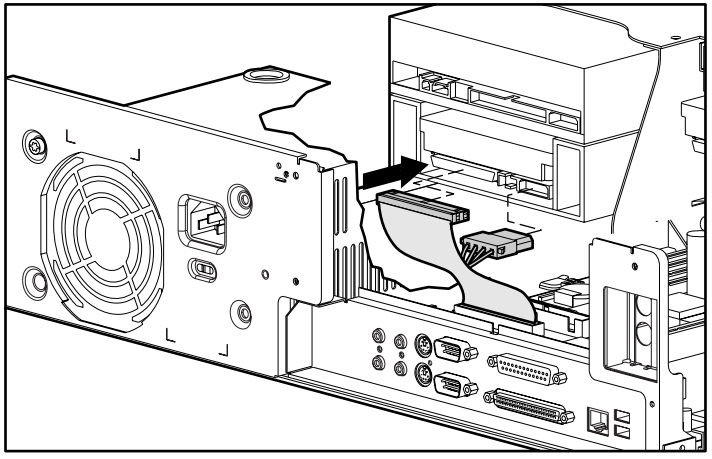


Figure 9-9. Connecting the signal and power cables

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

NOTE: If you are installing an *additional* Ultra ATA (IDE) drive, you should replace the existing 40-conductor cable with the 80-conductor cable provided in the option kit. This new cable will ensure optimum drive performance.

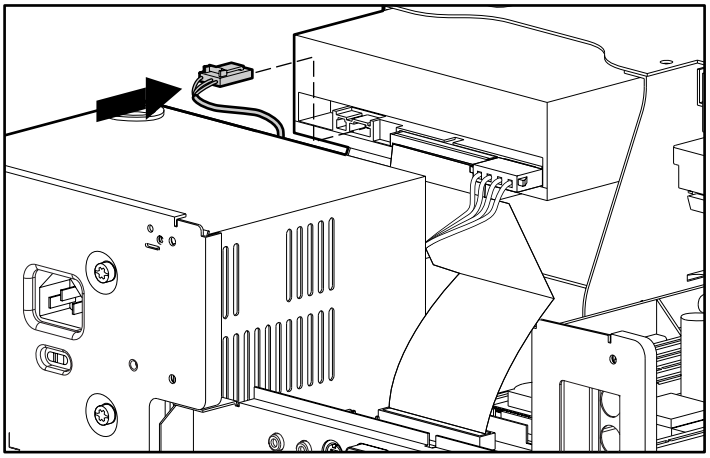


Figure 9-10. Connecting the audio cable

NOTE: The above illustration applies only if you are installing a CD-ROM or tape drive.

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

To install a 3.5-inch drive into a 5.25-inch drive bay, follow these steps:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Remove the following components:
   - ❏ workstation cover
   - ❏ front bezel
   - ❏ blank bezel
   - ❏ EMI shield (if applicable)
   - ❏ hard drive bay 5 (if installed)

3. Refer to the following illustrations to install a 3.5-inch drive in a 5.25-inch drive bay.

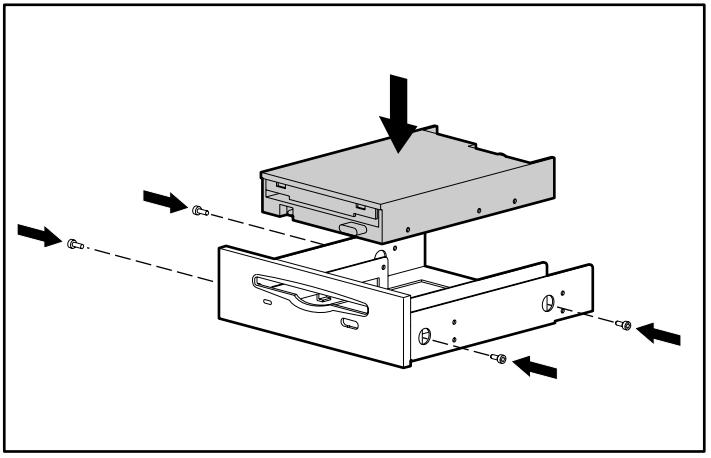


Figure 9-11. Attaching a 3.5-inch drive to the 5.25-inch bracket

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

NOTE: After you attach the 3.5-inch drive to the 5.25-inch bracket, refer to the previous section for installation procedures.

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

Installing Optional SCSI Devices

Aside from the internal SCSI hard drive preinstalled on your workstation (available on select models), 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 15 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.
  - 1 through 7 are available.
- Every SCSI chain or circuit must be terminated (closed) at both ends. Termination can be accomplished by using the terminating feature on the device or by using a terminated cable.
- SCSI devices may not have terminating jumpers on the device. Termination on these devices must be achieved with a terminated cable.
- Turn on an external SCSI device before turning on power to the workstation. This enables the system board controller to recognize the external SCSI device. 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 may 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):

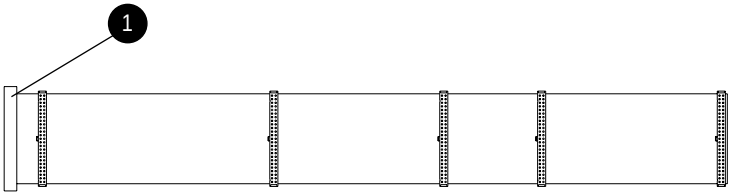


Figure 9-12. SCSI cable

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 the narrow SCSI device.

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

Installing a SCSI Device

Before you install a SCSI device:

- Verify the SCSI ID of the drive and, if necessary, set the SCSI ID to a unique number. Refer to 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. Refer to the section “Using the SCSI Cable” earlier in this chapter or refer to the documentation included with the device.

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

Chapter 10
Expansion Boards

This chapter provides instructions for installing and removing PCI or ISA expansion boards, and an Accelerated Graphics Port (AGP) graphics controller.

> **NOTE**: The following instructions also apply to installing and removing graphics boards. 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.

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

Installing an Expansion Board

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

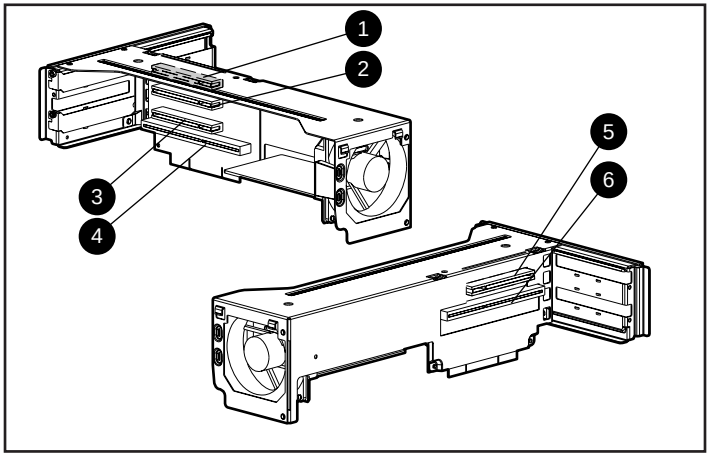


Figure 10-1. Identifying the expansion slots

Table 10-1
PCI/ISA Slots

Ref.		Component
❶		PCI expansion slot
❷		PCI expansion slot
❸	*	PCI expansion slot
❹	*	ISA expansion slot
❺		PCI expansion slot
❻		ISA expansion slot

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

NOTE: PCI=Peripheral Component Interconnect
ISA=Industry Standard Architecture

Removing an Expansion Slot Cover

To remove an expansion slot cover, follow these steps:

1. Remove the expansion board bracket from the workstation chassis.
2. Refer to the following illustration to remove an expansion slot cover.

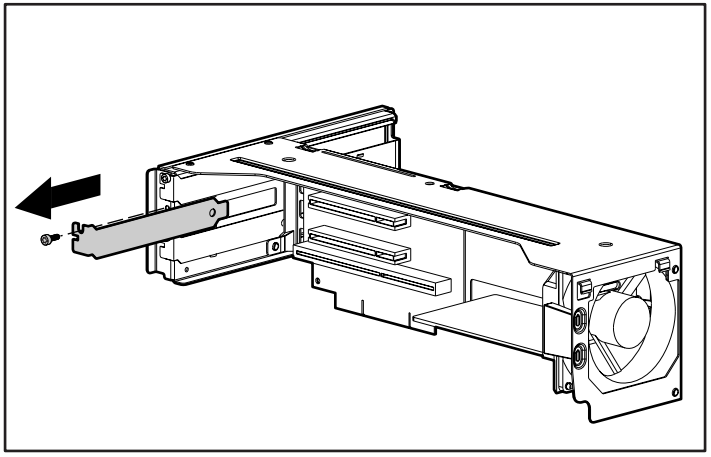


Figure 10-2. Removing the screw and expansion slot cover

NOTE: To replace an expansion slot cover, reverse the above procedure.

Installing a PCI or ISA Board

To install a PCI or ISA expansion board, follow these steps:

1. Remove the expansion board bracket from the workstation chassis.
2. Remove the expansion slot cover.
3. Refer to the following illustration to install a PCI or ISA board.

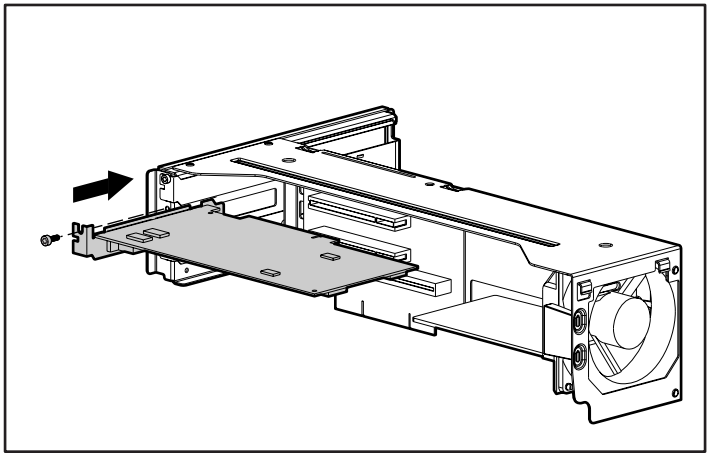


Figure 10-3. Installing an expansion board

NOTE: When you install an expansion board, be sure you press firmly on the board so that the whole connector seats properly in the expansion board slot. If you are installing a full length expansion board, be sure to engage the card guide located behind the fan bracket.

IMPORTANT: To remove a PCI or ISA board, 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. Store the board in an anti-static package. Remember to reattach the expansion slot cover.

Accelerated Graphics Port (AGP) Graphics Controller Connector

Your workstation also ships with an AGP graphics controller connector. The following figure shows the location of the AGP graphics controller connector.

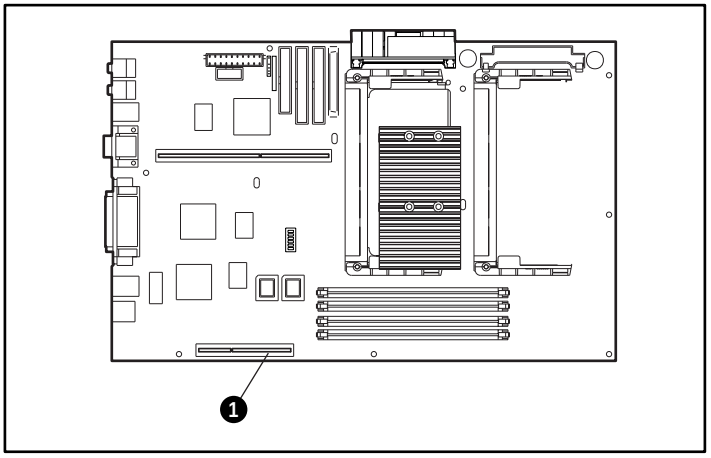


Figure 10-4. Identifying the AGP graphics controller connector

Installing and Removing an AGP Graphics Controller

To install the AGP graphics controller, remove the metal slot screw and cover, insert the board in the APG slot, and press firmly into place.

To remove the AGP graphics controller, hold the board at each end, then pull up. Be sure to replace the metal slot screw and cover.

Chapter 11
Processors

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

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

Installing an Additional Processor

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

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

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

To install a second Pentium II processor:

1. Turn off the workstation and disconnect the power cord from the grounded AC outlet and the back of the workstation.
2. Remove the following components:
   - ❑ workstation cover
   - ❑ expansion board bracket
   - ❑ all system board cables
   - ❑ system board with tray

3. Refer to the following illustrations to install an additional processor.

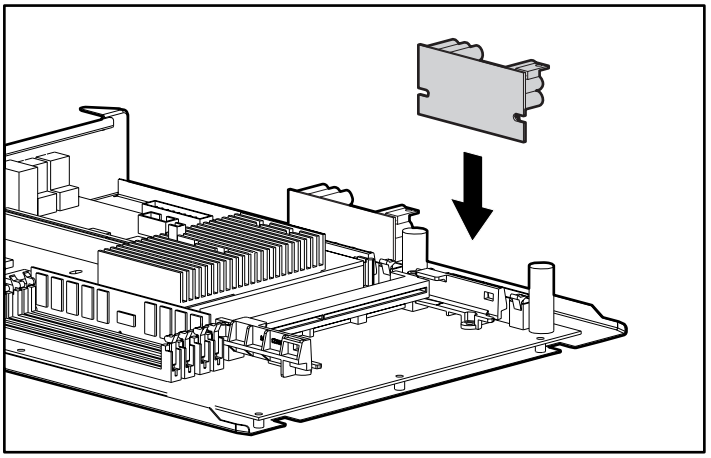


Figure 11-1. Installing the Processor Power Module

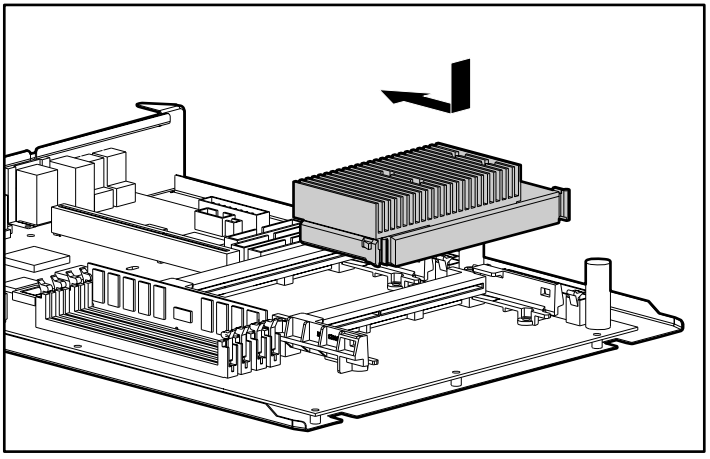


Figure 11-2. Installing a second processor/heatsink assembly

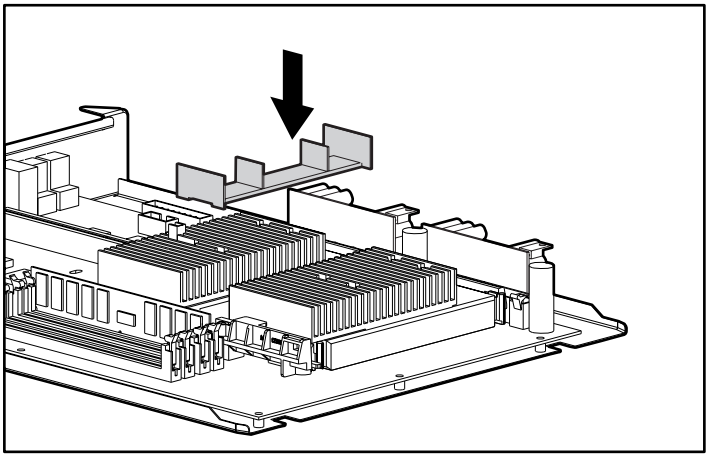


Figure 11-3. Attaching the heatsink bridge

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

Upgrading the Processor

Compaq Professional Workstations ship with a 350, 400, or 450 MHz Pentium II processor installed on the system board as the primary processor. To upgrade the processor, follow the installation procedures included with the processor upgrade kit.

NOTE: When you upgrade the primary processor, it is not necessary to upgrade or remove the primary processor power module. However, if you do remove the primary processor power module, you must reattach the cable insulator to the replacement module. The cable insulator is required only for the primary processor power module and protects cables from exposed leads.

Installing the Primary Processor Power Module Cable Insulator

CAUTION: Static electricity can damge the electronic components of the workstation. Before beginning these procedures, make sure you are discharged of static electricity by briefly touching a grounded metal object.

To install the cable insulator:

1. Perform the necessary service preparations.
2. Remove the following components:
   - ❑ workstation cover
   - ❑ expansion board bracket

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

NOTE: For better access to the processor power module, you may need to slide the system board out half way.

3. Press outward on both latches of the processor power module at the same time, then lift it from the system board.

4. Place the cable insulator over the end of the primary processor power module.

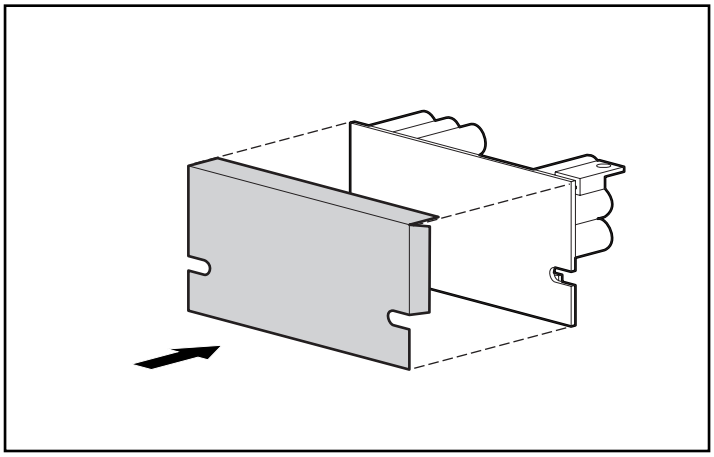


Figure 11-4. Installing the primary processor power module cable insulator

5. Firmly press the primary processor power module and cable insulator into the power module conector. Secure the two latches on the connector.

   NOTE: The latches of the primary processor power module connector hold the cable insulator in place.

6. Reassemble the workstation.

Chapter 12
Troubleshooting

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

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

Checklist for Minor Problems

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

- Check that the workstation and monitor are plugged into a working grounded AC outlet.
- Check to see that the workstation is turned on and the green power light is on.
- Check to see that the monitor is turned on and the green monitor light is on.
- Turn up the brightness and contrast controls of the monitor if the monitor is dim.
- Press and hold any key. If the system beeps, then your keyboard is operating correctly.
- Check all cable connections for loose connections or incorrect connections.

- Be sure all the needed device drivers have been installed (for example, if you are using a mouse, you need a mouse device driver).
- Ensure that all printer drivers have been installed for each application.
- Take out all diskettes from the diskette drives and all CDs from the CD-ROM drives before you turn on your system.
- If you have corrupted your Windows NT configuration, reboot the workstation. When the startup program prompts you to press the spacebar to invoke the last known good menu, press the spacebar. Windows NT remembers your last working configuration and runs it.

Troubleshooting Common Problems

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

Minor Problems

Table 12-1
Solving Minor Problems

Problem	Possible Cause	Possible Solution
Workstation won't turn on.	Workstation is not connected to a working grounded AC outlet.	Connect to a working grounded AC outlet.
	Cable to the grounded AC outlet is loose.	Ensure that cable is connected properly.
	A defective PCI or ISA card has been installed.	Remove any expansion board (adapter card) that was just installed.
	Boards or bracket not properly installed	Ensure boards are properly seated on the system board. Ensure bracket is properly installed in unit.

Continued

Minor Problems *Continued*

Problem	Possible Cause	Possible Solution
Workstation doesn't automatically display the date and time.	RTC (real-time clock) battery may need to be replaced. Battery life is approximately 5 years.	Replace the RTC battery. Refer to Appendix E, "Installing a New Battery," for installation instructions, or contact your Compaq authorized reseller or service provider for RTC battery replacement.
Workstation does not beep during the power-on self-test (POST).	Speaker cable is not properly attached	Ensure that speaker cable is connected.
	Speaker volume is turned down	Press volume up button. In Windows NT, select Volume Control under Accessories and adjust
	Headphones plugged in	Unplug headphones
System will not boot.	Expansion board bracket may not be seated properly.	If the LED is a steady amber color instead of green, reseat the expansion board bracket. When the LED is a steady green color, the expansion cage board is seated properly.

Continued

Minor Problems *Continued*

Problem	Possible Cause	Possible Solution
Workstation reset automatically.	The unit temperature was exceeded. The fan may be blocked.	1. Unit is in an exceedingly hot environment. Let it cool down. 2. Be sure internal cables are not blocking the air intake of the power supply. 3. Contact your Compaq authorized reseller or service provider.

Diskette Drive Problems

Table 12-2
Solving Diskette Drive Problems

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

Continued

Solving Diskette Drive Problems *Continued*

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

Display Problems

Table 12-3
Solving Display Problems

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

Continued

Solving Display Problems *Continued*

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

Continued

Solving Display Problems *Continued*

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

Audio Problems

Table 12-4
Solving Audio Problems

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

Printer Problems

Table 12-5
Solving Printer Problems

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

Hardware Installation Problems

Table 12-6
Solving Hardware Problems

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

Network Problems

Table 12-7
Solving Network Problems

Problem	Possible Cause	Possible Solution
Setup utility does not detect a network controller.	Possible resource conflict with another expansion board.	Either remove and reconfigure the conflicting expansion board, or reconfigure the network controller. If the address is changed, ensure that the drive parameters match the new I/O address for the network controller.
Setup utility reports unprogrammed EEPROM.	Possible resource conflict with another expansion board.	Either remove and reconfigure the conflicting expansion board, or reconfigure the network controller. If the address is changed, ensure that the drive parameters match the new I/O address for the network controller.
	The network controller is defective.	Contact your Compaq authorized service provider.
	Network drivers are not loaded.	Boot the workstation without the network drivers, using a system boot diskette, and reconfigure the network controller.

Continued

Solving Network Problems *Continued*

Problem	Possible Cause	Possible Solution
Diagnostics reports a failure.	Possible resource conflict with another expansion board.	Factory default is 300h to 30Fh for Ethernet. Either remove and reconfigure the conflicting expansion board, or reconfigure the network controller. If the address is changed, ensure that the drive parameters match the new I/O address for the network controller.
	The cable is not securely connected.	Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device.
	The cable is attached to the incorrect connector.	Ensure that the cable is attached to the correct connector.
	There is a problem with the cable or a device at the other end of the cable.	Ensure that the cable and device at the other end are operating correctly.
	The network controller is defective.	Contact your Compaq authorized service provider.
	Network controller interrupt overlaps the interrupt of an expansion board.	Run the Setup utility and modify the network controller memory value.

Continued

Solving Network Problems *Continued*

Problem	Possible Cause	Possible Solution
Diagnostics passes, but the workstation does not communicate with the network.	Network drivers are not loaded, or driver parameters do not match current configuration.	Make sure the network drivers are loaded and that the driver parameters match the configuration of the network controller.
	The network controller is not configured for this workstation.	In Windows NT, select the Network icon at the Control Panel.
	Network controller interrupt overlaps the interrupt of an expansion board.	Run the Setup utility and modify the network controller memory value.
Network controller stopped working when an expansion board was added to the workstation.	Network drivers are not loaded, or driver parameters do not match current configuration.	Make sure the network drivers are loaded and that the driver parameters match the configuration of the network controller.
	The cable is not securely connected.	Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device.
	Network controller interrupt overlaps the interrupt of an expansion board.	Run the Setup utility and modify the network controller memory value.

Continued

Solving Network Problems *Continued*

Problem	Possible Cause	Possible Solution
Network controller stopped working when an expansion board was added to the workstation. (*Continued)*	The network controller requires drivers.	Verify that the drivers were not accidentally deleted when the drivers for a new expansion board were installed.
	The files containing the network drivers are corrupted.	Reinstall the network drivers using your backup diskettes.
Network controller stopped working without apparent cause.	The files containing the network drivers are corrupted.	Reinstall the network drivers using your Compaq SmartStart for Workstations CD.
	The cable is not securely connected.	Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device.
	The network controller is defective.	Contact your Compaq authorized service provider.

Memory Problems

Table 12-8
Solving Memory Problems

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

CD-ROM Drive Problems

Table 12-9
Solving CD-ROM Drive Problems

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

Appendix A
Regulatory Compliance Notices

Federal Communications Commission Notice

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

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

Class A Equipment

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

Class B Equipment

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

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

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.

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.

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.

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.

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 fire, bodily injury, and damage to the equipment, observe the following precautions:

- Do not operate controls, make adjustments, or perform procedures to a laser device other than those specified herein or in the CD-ROM drive installation guide.

- Allow only Compaq Authorized Service Technicians to repair the laser equipment.

Compliance with CDRH Regulations

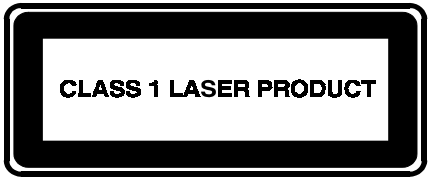
The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

Compliance with International Regulations

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

Laser Product Label

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



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

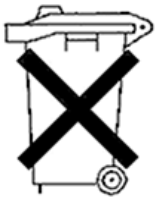
Laser Information

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

Battery Replacement Notice

Your computer is provided with a lithium battery powered Real-Time Clock circuit. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated.

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



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

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

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

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm ± 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

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

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

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

Appendix C
Power Cord Set Requirements

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

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

General Requirements

The requirements listed below are applicable to all countries:

- The length of the power cord must be at least 6.0 feet (1.8 m) and a maximum of 12 feet (3.7 m).
- The power cord set must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord will be used.
- The power cord set must have a minimum current capacity and nominal voltage rating of 10 A/125 volts AC, or 10A/250 volts AC, as required by each country's power system.
- The appliance coupler must meet the mechanical configuration of an EN60320/IEC 320 Standard Sheet C13 Connector, for mating with the appliance outlet on the computer.

Country-Specific Requirements

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

Table C-1
Power Cord Set Requirements - By Country

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

Notes:

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

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

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

Appendix D
POST Error Messages

Error Messages

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

POST Error Messages and Codes

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

Continued

POST Error Messages and Codes *Continued*

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

Continued

POST Error Messages and Codes *Continued*

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

Continued

POST Error Messages and Codes *Continued*

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

Continued

POST Error Messages and Codes *Continued*

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

Continued

POST Error Messages and Codes *Continued*

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

Appendix E
Installing a New Battery

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

Running Computer Setup

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

1. Run Computer Setup and record the drive type displayed in the System Configuration Summary.
2. If the drive type number is 65 or 66, record the drive parameters.

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

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

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

Installation Procedures

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

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

To install the replacement battery, follow these steps:

1. If the workstation is on, turn it off, then unplug the power cord from the grounded AC outlet.
2. Remove the workstation cover and the expansion board bracket.
3. Remove and discard the protective covering on the adhesive on the hook and loop fastener on the back of the battery and attach the battery to the side of the power supply.
4. Plug the battery connector onto pins 1-4 on the system board.

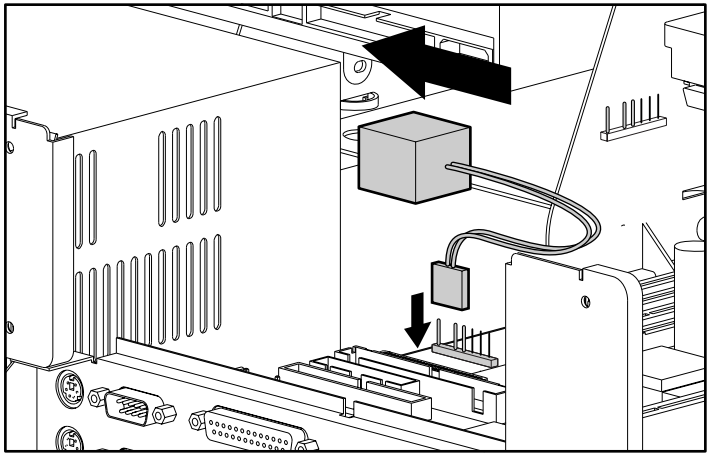


Figure E-1. Attaching the replacement battery

5. Change the jumper from pins 6-7 ❶ to pins 5-6 ❷.

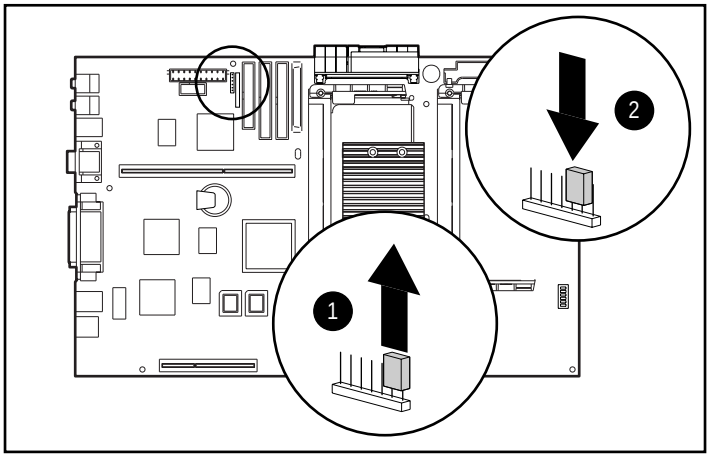


Figure E-2. Changing the jumper from pins 6-7 to pins 5-6

6. Place the pale blue sticker included with the battery kit above the power connector on the back of the workstation.
7. Replace the expansion board bracket and workstation cover.
8. Plug the power cord into an grounded AC outlet.
9. Turn on the workstation.
10. Run Computer Setup to reconfigure the system.
11. If the workstation has a Compaq hard drive, you have now successfully completed the installation.

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

Appendix F
Smart Cover Sensor Settings

Sensor Settings

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

Smart Cover Sensor

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

Continued

Smart Cover Sensor *Continued*

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

Continued

Smart Cover Sensor *Continued*

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

Continued

Smart Cover Sensor *Continued*

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

* Maximum security setting

** Default

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

For additional information, refer to Chapter 3.

Index

Symbols

1

100BaseTX network 5-2
10BaseT standard 100BaseTX
controller 5-1

3

3.5-inch drive
installing in 5.25-inch bracket
described 9-9
illustrated 9-10

5

5.25-inch drive
installing
described 9-7

6

68- to 50-pin external SCSI adapter
9-12

A

About This Guide ix
Accelerated Graphics Port graphics
controller 10-5
connector 1-9, 7-12
access to Compaq Utilities Menu 2-1
ACPI, described 4-8
AGP graphics controller 10-5
connector 1-9
AGP graphics controller connector
7-12
Alt key 1-12
Application key 1-12
Asset Management 1-4
assistance, technical xi
ATA 9-1
audio 1-3. *See* audio system
ESS 1868 driver 6-5
troubleshooting 12-10
audio cable, connecting 9-9
audio line-in 1-8
audio line-out 1-8
audio system
upgrading 6-5
using audio CDs 6-4
using PremierSound 6-5
Authorized Reseller xii
Automatic Diagnostics 2-5
auxiliary battery *See* battery

B

Backspace key 1-11
Battery
connecting to system board E-2
moving jumper E-3
recycling notice A-8
replacing E-1
running Computer Setup E-1
battery replacement notice A-8
bay configurations, installing drives
9-1
beeps, system 4-4
bezel, blank drive
described 9-2
illustrated 9-2
bezel, front
illustrated 7-7

BIOS *See also* ROM BIOS
described 2-8
runtime services 2-8
upgrading 2-9
Boot Block ROM *See* FailSafe Boot Block ROM
bracket *See* hard drive bracket
broken key icon 3-3
buttons
CD-ROM drive ejector 1-6
diskette drive ejector 1-6
power switch 1-7
volume control 1-6

C

cable insulator *See* Upgrading the Processor
cable lock
installing 3-20
purpose 3-2
cables *See* Four-Port splitter cable. *See* Audio cable. *See* SCSI cable. *See* signal and power cables
Canadian notice A-4
Caps Lock key 1-11
CD clamps 6-1
CDRH regulations A-7
CD-ROM drive 1-6
bay configurations 9-1
cleaning 6-4
inserting CD
described 6-1
illustrated 6-1
installing 9-7
operating precautions 6-4
troubleshooting 12-18
using CD-ROM software 6-3
CDs, playing audio 6-4
character, delimiter for changing passwords 3-5
Class A equipment A-1, A-4
Class B equipment A-2, A-4
codes, POST errors D-1
combination keys 1-13
communications
network 5-1
Compaq Authorized Reseller xii
Compaq Diagnostics for Windows NT
purpose 4-11
using 4-12
Compaq Insight Management Agents 4-13
Compaq Insight Manager 4-13
Compaq Integrated Software, availability 4-10
Compaq Professional Workstation AP400, illustrated 1-1
Compaq Utilities Menu, accessing 2-1. *See also* configuration and diagnostics utilities
Compaq website xi
components
front panel 1-6
front panel, illustrated 1-6
installation precautions 7-2
installation sequence 7-2
internal
illustrated 7-7
listed 7-8
rear panel 1-8
rear panel, illustrated 1-8
system board
illustrated 7-11
listed 7-11
Computer Checkup (TEST) 2-4
computer setup 2-2
computer setup password

changing 3-10
clearing 3-12
deleting 3-11
entering 3-8
establishing 3-8
configuration and diagnostics utilities
Computer Checkup (TEST) 2-4
Computer Setup 2-2
Power Management 2-3
Security Management 2-3
View System Information (INSPECT) 2-6
Configuration Management, features 4-1
configuration, system 7-4
connectors *See* external connectors
Accelerated Graphics Port graphics controller 1-9, 7-12, 10-5
AGP graphics controller 1-9, 7-12, 10-5
audio line-in 1-8
audio line-out 1-8
diskette drive 7-11
ethernet RJ-45 1-9
expansion board 7-12
IDE 7-11
keyboard 1-9
mouse 1-9
network 1-9
parallel port 1-9
power 7-11
power cord 1-8
SCSI 7-11
SCSI port 1-9
serial port 1-9
USB 1-9
cover sensor *See* Smart Cover Sensor
cover, removing, illustrated 7-5
creating a diagnostic diskette 2-6
creating a setup diskette 2-6
Ctrl key 1-11

D

Declaration of Conformity A-3
Delete key 1-12
delimiter characters, keyboard 3-5
device drivers, upgrade support 4-10
diagnostic diskette, creating 2-6
diagnostic partition 2-7
diagnostic tools 1-4
diagnostics *See also* configuration and diagnostics utilities
Automatic 2-5
Prompted 2-5
Quick Check 2-5
DIMM installation 8-2
DIMM sockets 7-12
DIMMs *See* memory
Diskette boot, disabling 3-15
diskette drive 1-6
bay configurations 9-1
installing in 5.25-inch drive bay described 9-9
troubleshooting 12-6
diskette drive connector 7-11
Diskette write, disabling 3-15
display *See* monitor
troubleshooting 12-8
drive bays 1-3
drive bezel, removing
described 9-2
illustrated 9-2
drive controller 1-2
drive locations, illustrated 9-2
driver
ESS 1869 6-5

drives
CD-ROM 1-6
diskette 1-6

E

electrostatic discharge B-1
EMI shield 9-3
removing,illustrated 9-3
Energy Save Monitor feature 2-3
Energy Star 2-3
equipment
Class A A-1, A-4
Class B A-2, A-4
Error Checking and Correcting (ECC) 1-2
error messages and codes D-1
Esc key 1-11
ESD *See* electrostatic discharge
ESS 1869 driver 6-5
ethernet *See* network
European Union notice A-5
expansion board
full length board card guide 10-4
installing a full-height board 10-4
installing, described 10-4
installing, illustrated 10-4
expansion board connector 7-12
expansion slot 1-2
identifying PCI/ISA 10-1
illustrated 10-1
removing cover
described 10-3
illustrated 10-3
external battery *See* battery
external battery jumper 7-11
external connectors *See also* rear panel components

F

F1-F12 keys 1-11
FailSafe Boot Block ROM 2-9, 4-4
features
Asset Management 1-4
audio 1-3
diagnostic tools 1-4
drive bays 1-3
drive controller 1-2
ECC 1-2
expansion slots 1-2
graphics controller 1-2
hard drives 1-3
Intelligent Management 1-4
L2 Cache 1-2
memory 1-2
network controller 1-3
power supply 1-3
processors 1-2
product 1-1
ROM 1-3
secondary storage 1-3
security 1-4
software 1-3
standard 1-2
standard interfaces 1-3
warranty 1-4
Federal Communications Commission (FCC) Notice A-1
Flash recovery diskette
obtaining 4-4
using 4-4
Flash ROM *See also* ROM BIOS. *See also* BIOS
protecting 4-2

recovery from ROM upgrade failure 4-4
upgrading 2-9, 4-2
upgrading remotely 4-3
front bezel
illustrated 7-7
latches, illustrated 7-6
front panel components
power on/off LED 1-7
front panel components, illustrated 1-6

G

getting help xi
graphics controller 1-2, 1-5, 10-1
AGP
installing, described 10-5
AGP connector
illustrated 10-5
removing, described 10-5
grounding methods B-1
guidelines, important
replacing DIMMs 8-2

H

HAL 11-3
hard drive 1-3
bay configurations 9-1
installing 1.6-inch hard drive 9-4
removing hard drive bracket, illustrated 9-4
hard drive bracket
illustrated 9-5
hard drives
Ultra ATA (IDE) 9-1
Wide-Ultra SCSI 9-1
hardware installation, troubleshooting 12-12
hardware problems, solving 12-3
hardware upgrade preparations 7-1
headphone jack 1-6
help xi
hood label, location of 7-6
http://www.compaq.com xi

I

Icon
broken key 3-3, 3-9
key 3-2, 3-8
symbols on equipment x
IDE connector 7-11
Industry Standard Architecture slot *See* expansion slot
INSPECT 2-6
installing additional memory 8-1
Intel 10/100Mbps Integrated Autosending Ethernet 5-1
Intel Pentium II processor
installing 11-1
installing heatsink bridge
illustrated 11-3
installing processor power module
described 11-2
illustrated 11-2
slot locations 7-11
upgrading 11-3
Intelligent Management 1-4, 4-1
internal components
illustrated 7-7
listed 7-8
international regulations A-7
ISA slot *See* expansion slot

J

jack
headphone 1-6
microphone 1-3
Japanese notice A-5
jumper, external batter 7-11

K

key icon 3-2, 3-8
keyboard 1-9
enabling and disabling interface 3-18
illustrated 1-10
national delimiter characters 3-5
using special function keys 1-10
using Windows logo keys 1-13
keyboard lights
Caps Lock 4-5
detection of invalid system ROM 4-4
identifying 1-14
illustrated 1-14, 4-5
Num Lock 4-5
Scroll Lock 4-5
keys
Alt 1-12
Application 1-12
Backspace 1-11
Caps Lock 1-11
combinations 1-13
Ctrl 1-11
Delete 1-12
Esc 1-11
keys *Continued*
F1-F12 1-11
Num Lock 1-11
Pause 1-11
Print Scrn 1-11
Scroll Lock 1-11
Windows Logo 1-12

L

L2 Cache 1-2
laser devices A-6
laser product label A-7
laser safety warnings A-6
latches, front bezel 7-6
LED *See* lights
lights
Caps Lock 1-14
CD-ROM drive 1-6
diskette drive 1-6
hard drive activity 1-7
keyboard 1-14
network activity 1-7
Num Lock 1-14
power on/off 1-7
Scroll Lock 1-14
trouble 1-7
Logitech OEM MouseWare, installation information 1-10
logon password, described 3-1
loosening the thumbscrews 7-5

M

M3 metric thread
hardware 9-8
screws 9-8
managing a diagnostic partition 2-7

memory 1-2
configuration requirements 8-1
important installation guidelines 8-2
installing DIMMs
described 8-4
illustrated 8-5
maximum 8-1
removing DIMMs
described 8-5
troubleshooting 12-17
memory upgrades 8-1
messages, error D-1
Microsoft Windows 95 4-9
Microsoft Windows NT Workstation 3.51 4-9
Microsoft Windows NT Workstation 4.0 4-9
monitor
energy save feature 2-3
troubleshooting 12-8
mouse 1-9
enabling and disabling interface 3-18
Logitech OEM MouseWare 1-10
mouse compliance statement A-4
multiprocessing HAL 11-3
music
playing 6-5
recording 6-5

N

network
cable to RJ-45 connector 5-2
changing configuration settings 5-3
network *Continued*
controller 5-1
installing drivers 5-3
RJ-45 connector
connecting to 5-2
Token Ring 5-1
troubleshooting 12-13
network connector 1-9
network controller 1-3
Num Lock key 1-11

O

operating system
BIOS runtime services 2-8

P

parallel interface
disabling 3-16
parallel interface control, described 3-2
parallel port 1-9. *See* parallel interface
password
logon 3-1
power-on 3-1
setup 3-1
password security 3-2
passwords *See* Logon Password. *See* Setup Password. *See* Power-On Password
Pause key 1-11
PCI slot *See* expansion slot
Pentium II processor
installing 11-1
installing heatsink bridge
illustrated 11-3

Pentium II processor *Continued*
installing processor power module
described 11-2
illustrated 11-2
slot locations 7-11
upgrading 11-3
Peripheral Component Interconnect slot *See* expansion slot
phone numbers xii
ports
parallel 1-9
SCSI 1-9
serial 1-9
video 1-8
POST *See* Power-On-Self-Test
power connector 7-11
power cord 1-8
power cord set requirements C-1
Power Management
description 2-3
establishing settings 4-7
power supply 1-3
power switch 1-7
power-On password
changing 3-4
clearing 3-6
deleting 3-4
described 3-1
entering 3-3
establishing 3-2
Power-On Self-Test
error messages D-1
sequence 2-8
preinstalled software 1-5
PremierSound audio system, using 6-5
preparations
hardware upgrade 7-1
primary processor power module insulator 11-4
primary processor slot 7-12
Print Scrn key 1-11
printer, troubleshooting 12-11
problems
audio 12-10
CD-ROM 12-18
common 12-3
diskette drive 12-6
display 12-8
hardware installation 12-12
memory 12-17
minor 12-3
monitor 12-8
network 12-13
printer 12-11
processor 1-2
installing
described 11-1
illustrated 11-2
installing processor power module
described 11-2
illustrated 11-2
upgrading 11-3
processor power module
installing
described 11-2
illustrated 11-2
product features 1-1
Product Safety Information x
Prompted Diagnostics 2-5

Q

Quick Check Diagnostics 2-5
QuickBlank
enabling 3-17

QuickBlank *Continued*
function 3-1
QuickLock
enabling 3-17
function 3-1

R

rear panel components 1-8
reconfiguring the workstation 7-4
Remote Management Setup 4-3
Remote Reboot 4-7
Remote ROM Flash, using 4-3
Remote Security Management 4-6
Remote Shutdown 4-7
Remote Wakeup 4-7
support 4-7
removable media control, described 3-2
removing
expansion board bracket 7-8
front bezel 7-6
system board tray 7-9
workstation cover 7-5
RJ-45 connector *See also* network
connecting to network 5-2
ROM 1-3. *See* BIOS. *See* ROM BIOS
ROM BIOS
described 2-8
recovery from ROM upgrade failure 4-4
upgrading 2-9
upgrading remotely 4-3
ROMPaq
Remote ROM Flash 4-3
upgrading ROM BIOS 2-9
ROMPaq, upgrading ROM BIOS 4-2

S

Scroll Lock key 1-11
SCSI adapter, 68- to 50-pin 9-12
SCSI cable, illustrated 9-12
SCSI connector 7-11
SCSI controller, support for *See also* network
SCSI devices
68- to 50-pin adapter 9-12
cabling 9-12
important installation guidelines 9-11
installing 9-11, 9-13
setting ID numbers 9-11
terminating SCSI chain 9-11
SCSI ID numbers, setting 9-11
SCSIport 1-9
secondary processor slot 7-12
secondary storage 1-3
security 1-4
security bracket
illustrated 3-20
installing 3-20
security features 3-1
described 3-1
Security Management
advanced features 3-13
use 2-3
serial interface
disabling 3-16
purpose of 3-1
serial number 1-9
serial port 1-9. *See* serial interface
service and support xi
setting, SW1 switch 7-12
setup diskette, creating 2-6

setup password
changing 3-10
clearing 3-12
deleting 3-11
described 3-1
entering 3-8
establishing 3-8
purpose of 3-7
slots
primary processor 7-12
secondary processor 7-12
Smart Cover Sensor
enabling or disabling settings F-1
levels of protection 3-19
purpose of 3-2
SmartStart for Workstations 1-2, 1-5
sockets, DIMM 7-12
software 1-3
Compaq Diagnostics for Microsoft Windows NT 4-11
Compaq Insight Management Agents 4-13
Compaq Insight Manager 4-13
Compaq Setup and Diagnostic 2-1
Logitech OEM MouseWare 1-10
preinstalled 1-5
Remote Management Setup 4-3
SmartStart for Workstations 1-2, 1-5
Software Installation Guide 1-5
Support Software CD 4-9, 4-10
software problems, solving 12-3
special function keys 1-11
standard features 1-2
standard interfaces 1-3
support xi
support software
obtaining 4-9
use 4-9
support software diskettes *See* SSD.
SW1 switch setting 7-12
SW1 switch, illustrated 3-6, 3-12
switch
voltage selector 1-8
Symbols
on equipment x
symbols in text x
system board
components
illustrated 7-11
listed 7-11
removing tray
described 7-9
illustrated 7-10
system configuration 7-4

T

Taiwan notice A-6
tape drive
bay configurations 9-1
installing 9-7
technical support xi
telephone numbers xii
TEST 2-4
text conventions ix
thumbscrews
loosening 7-5
time-out periods 2-3
Token Ring network 5-1
troubleshooting
audio 12-10
CD-ROM drive problems 12-18
common minor problems 12-3

troubleshooting *Continued*
diskette drive 12-6
display 12-8
hardware installation 12-12
memory problems 12-17
network problems 12-13
preliminary checklist 12-1
printer 12-11

U

Ultra ATA (IDE) hard drive 9-1
upgrade preparations 7-1
upgrading the workstation 8-1
USB 1-9
utilities
Computer Checkup (TEST) 2-4
computer Setup 2-2
Power Management 2-3
Security Management 2-3
View System Information (INSPECT) 2-6

V

video *See* monitor
video port 1-8
View System Information (INSPECT) 2-6
voice messages, recording 6-5
voltage selector switch 1-8
volume control 1-6

W

warranty 1-4
Windows 95 4-9
Windows Logo key 1-12
Windows NT Workstation 3.51 4-9
Windows NT Workstation 4.0 4-9
workstation
reconfiguring 7-4
securing 3-1
workstation cover, removing, illustrated 7-5