Technical Reference Guide

HP Workstation xw8000



Manufacturing Part Number: 309236-001

© Copyright 2003 Hewlett-Packard Company.

Legal Notices

The information contained in this document is subject to change without notice.

Hewlett-Packard makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

Hewlett-Packard shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Hewlett-Packard assumes no responsibility for the use or reliability of its software on equipment that is not furnished by Hewlett-Packard.

This document contains proprietary information that is protected by copyright. All rights are reserved. No part of this document may be photocopied, reproduced, or translated to another language without the prior written consent of Hewlett-Packard Company.

Adaptec® is a registered trademark of Adaptec, Inc. Adobe and Acrobat are trademarks of Adobe Systems Incorporated. NVIDIATM, GeForce2 GTSTM, Quadro2 PROTM and Quadro2 EXTM are registered trademarks or trademarks of NVIDIA Corporation.

Matrox® is a registered trademark of Matrox Electronic Systems Ltd. Microsoft®, Windows®, MS-DOS®, Windows NT® and Windows 2000® are registered trademarks of the Microsoft Corporation. Pentium® and AGPsetTM are trademarks of Intel Corporation. WOLTM (Wake on LAN) is a trademark of IBM.

Red Hat®, the Red Hat "Shadow Man" logo, RPM, Maximum RPM, the RPM logo, Linux Library, PowerTools, Linux Undercover, RHmember, RHmember More, Rough Cuts, Rawhide and all Red Hat-based trademarks and logos are trademarks or registered trademarks of RedHat, Inc. in the United States and other countries.

Linux® is a registered trademark of Linus Torvalds.

 $Pentium^{TM} \mbox{ is a trademark of Intel Corporation }$

UNIX is a registered trademark in the United States of America and other countries, licensed exclusively through X/Open Company Limited.

1980, 1984 AT&T, Inc.

1979, 1980, 1983 The Regents of the University of California.

This software and documentation is based in part on the Fourth Berkeley Software Distribution under license from the Regents of University of California.

Printing History

The manual printing date and part number indicate its current edition. The printing date will change when a new edition is printed. Minor changes may be made at reprint without changing the printing date. The manual part number will change when extensive changes are made.

Manual updates may be issued between editions to correct errors or document product changes. To ensure that you receive the updated or new editions, you should subscribe to the appropriate product support service. See your HP Sales Representative for details.

First Edition: January 2003

Printing Division:

Hewlett-Packard Co. Personal Systems Group, Workstation Global Business Unit 3404 E. Harmony Rd. Fort Collins, CO 80525

Printed in the U.S.A.

1. Product Information

Workstation Components 12
Front Control Panel Features
Rear Panel Features 14
Internal Features
Power Supply and Cooling 15
Power Supply Input Requirements 16
Power Consumption and Cooling 17
System Fans and Airflow 18
Resetting the Power Supply 19
Environmental Specifications
Where to Get Help
Contacting HP Customer Care
Information You Need
Online Support, Drivers and Documentation

2. Installing or Replacing Parts and Accessories

Overview
Internal Components
Remove/Replace Prerequisites
Read the Power and EMI Warning and Note
Gather Your Tools
Follow Electrostatic Discharge (ESD) Precautions
Removing and Replacing Covers
Removing the Side Cover
Removing the Front Bezel
Replacing the Side Cover and Front Bezel 29
Memory Modules
Removing Memory Modules
Installing Memory Modules
Accessory and Graphics Cards
Removing an Accessory or Graphics Card
Installing a Graphics or Accessory Card
Hard Drives
Removing a Hard Drive
Installing a Hard Drive
Optical Drives
Removing an Optical Drive
Installing an Optical Drive
Floppy Drive
Removing a Floppy Drive
Installing a Floppy Drive
Power Supply
Removing the Power Supply 48
Replacing a Power Supply

Contents

System Fan	51
Removing the System Fan	51
Installing a System Fan	52
Control Panel Assembly	53
Removing the Control Panel Assembly	53
Installing the Control Panel Assembly	56
Front Panel Connectors	57
Removing the Front Panel I/O Assembly	57
Installing the Front Panel I/O Assembly	58
Processor and Heatsink	59
Removing a Heatsink	59
Removing a Processor	61
Installing a Processor	62
Replacing a Heatsink	63
Installing a New Heatsink	65
System Board	66
Removing the System Board	66
Installing the New System Board	68
System Battery.	70
Removing the Battery	70
Installing the Battery	71

3. System Configuration and Monitoring

Configuring your Workstation with the HP Setup Program	74
Starting the HP Setup Program	74
Main Menu	75
Advanced Menu	75
Security Menu	76
Boot Menu	78
Power Menu	78
BIOS Features and Specifications	79
BIOS Version	80
Updating the System BIOS	80
Restoring BIOS Defaults	80
Clearing the CMOS.	81
Recovering the BIOS from the Boot Block	82
Hardware Monitoring	83
Power On Self Test (POST)	83
E-buzzer	83
LEDs	83
Sensors	83

Contents

4. Troubleshooting

Identifying and Solving Hardware Problems 8	36
Monitor is Blank or Doesn't Work 8	87
Keyboard or Mouse Doesn't Work 8	38
Audio Doesn't Work	39
Optical Drive Problems	90
Hard Disk Drive Problems	92
Understanding the LED messages	93
Power LED is Flashing or Red	93
Hard Disk Drive Activity LED Doesn't Work 9	93
Understanding Power-on-Self-Test messages 9	94
Troubleshooting with the e-buzzer 9	96
Diagnostics Software	97
You Forgot Your Password	98
Clearing the BIOS User Password	98
Clearing the BIOS Administrator Password	98

A. Connector Pin Assignments

Connector Pin Assignment	5	100
---------------------------------	---	-----

Contents

	Preface
	Important Warnings
	Avoid Electrical Shocks
WARNING	To avoid electrical shock, do not open the power supply. There are no user-serviceable parts inside.
	To avoid electrical shock and harm to your eyes by laser light, do not open the laser module. The laser module should be serviced by service personnel only. Do not attempt to make any adjustment to the laser unit. Refer to the label on the CD-ROM for power requirements and wavelength. This product is a class I laser product.
	Electrical
WARNING	For your safety always connect the equipment to a grounded wall outlet. Always use a power cord with a properly grounded plug, such as the one provided with the equipment, or one in compliance with your national safety standards. This equipment can be disconnected from the power by removing the power cord from the power outlet. This means the equipment must be located close to an easily accessible power outlet.
	Multimedia Models
WARNING	If your system is a multimedia model, or if you have installed a sound card in your system, always turn the volume down before connecting the headphones or speakers. This prevents discomfort from unexpected noise or static. Listening to loud sounds for prolonged periods of time may permanently damage your hearing. Before putting on headphones, place them around your neck and turn the volume down. When you put on the headphones, slowly increase the volume until you find a comfortable listening level. When you can hear comfortably and clearly, without distortion, leave the volume in that position.
	Removing And Replacing The Cover
WARNING	For your safety, never remove the system cover without first disconnecting the power cord from the power outlet and removing any connection to a telecommunications network. Always replace the cover before switching the workstation on again.

	Safety Information				
WARNING	There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn an old battery. Replace the battery with the same or equivalent type, as recommended by the manufacturer.				
	The battery in this workstation is a lithium battery that does not contain any heavy metals. However, to protect the environment, do not dispose of batteries in household waste. Return used batteries either to the shop from which you bought them, to the dealer from whom you purchased your workstation, or to HP so that they can either be recycled or disposed of in the correct way. Returned batteries will be accepted free of charge.				
	If you have a modem:				
	Do not attempt to connect this product to the phone line during a lightning storm. Never install telephone jacks in wet locations unless the telephone line has been disconnected at the network interface. Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface. Use caution when installing or modifying telephone lines. Avoid using a telephone (other than a cordless type) during an lightning storm. There may be a risk from lightning.				
	Do not use the telephone to report a gas leak in the vicinity of the leak.				
	Never touch or remove the communications board without first removing the connection to the telephone network.				
	Static Electricity				
CAUTION	Static electricity can damage electronic components. Turn OFF all equipment. Do not let your clothes touch the accessory. To equalize the static electricity, rest the accessory bag on top of the system while you are removing the accessory from the bag. Handle the accessory as little as possible and with care.				

1

Product Information

This chapter:

- Introduces the workstation internal and external components
- Lists the system specifications and characteristic data
- Provides a summary of available documentation and support

Workstation Components

This section covers the main components of the hp workstation xw8000. For a complete list of components and part numbers, see the *hp workstation xw8000 Illustrated Parts Map* provided with your system.

For updated information about available graphics cards, drives and accessories, go to:

www.hp.com/go/bizsupport

Table 1-1Workstation Physical Characteristics

Weight	18-23kg (40-51 lb.), depending on configuration
Dimensions	
Tower	449 mm (17.7 in.) tall 210 mm (8.3 in.) wide 515 mm (20.3 in) deep
Rack Mount (with cosmetic foot removed)	210 mm (8.3 in.) tall 440 mm (17.3 in.) wide 515 mm (17.3 in.) deep
Footprint	108,150 mm ² (168.5 in. ²)

Front Control Panel Features

Figure 1-1 Front View of Workstation



The workstation control panel has the following features:

- **Power On/Off button** Starts the workstation. You can also wake the workstation from Hibernate or Stand By mode by pressing this button for less than four seconds. For more information about Hibernate and Stand By, see "Using Power Management" in the *hp workstation xw8000 Getting Started Guide*.
- **Reset button** Re-initializes all the hardware without cycling power to the system. Avoid general use of this button because file damage may occur.
- Power LED
 - Solid green: System on.
 - Solid yellow: Workstation is in Stand By or Hibernate mode. (Refer to the *hp* workstation xw8000 Getting Started Guide and your OS documentation for more information.)
 - Flashing yellow, flashing red, or solid red: System error.
- Hard Disk Activity LED flickers when your hard disk is being accessed. Activated during Power-on Self Test (POST) and during hard disk drive access.

Rear Panel Features

Figure 1-2

Rear View of Workstation



Internal Features





Power Supply and Cooling

The workstation power supply has six outputs:

- +3.3V PCI, AGP, Placer MCH, ICH4, Audio, SCSI, on-board logic and input for on-board voltage regulators
- +5V disk drives, PCI, AGP, and on-board logic
- +12VDIG input voltage for the input to the voltage regulator that supplies power for the processors
- +12VIO used everywhere else 12V is required, including fans, PCI, AGP, disk drives and input to on-board voltage regulators
- -12V used by PCI
- 5VSB for "sleep" circuitry

Table 1-2xw8000 Power Supply Output: Maximum and Minimum Loads

Voltage	+3.3V	+5V	+12V-CPU	+12 V-IO	-12V	+5VSB
Voltage: Max	$3.47\mathrm{V}$	$5.25\mathrm{V}$	12.6V	12.6V	-12.6V	$5.25\mathrm{V}$
Min	3.17V	$4.85\mathrm{V}$	$11.52\mathrm{V}$	$11.52\mathrm{V}$	-11.4V	4.85V
Current: Max	34 A	20 A	16 A	14 A	-0.55 A	2.0 A
Min	4 A	1.0 A	1 A	0 A	0.0 A	0.0A

Total continuous output power not to exceed 450W.

Combination of 5V and 3.3V power not to exceed 250W.

NOTE	Power Supply Input Requirements
Table 1-3	xw8000 Power Supply Input Requirements

Input voltage range(s)	Auto-ranging, 100-250V
Input frequency range	50-60Hz
Maximum output power	450W
Maximum input power	692W
Off mode power (plugged in, but off)	7W
Idle mode power	160W
Warm in-rush (peak current at low VAC)	70 A @ 110VAC
Warm in-rush (peak current at high VAC)	152 A @ 240VAC
Cold in-rush (peak current at low VAC)	18.4 A @ 110 V
Cold in-rush (peak current at high VAC)	40 A @ 240V
Maximum RMS current at low VAC	7.7 Arms @ 90VAC

 NOTE
 For power cord and plug specifications (depending on country, voltage, and current), see:

 www.hp.com/workstations/products/accessories/unix/power_kits/a4199a/

 data_sheet/a4199a.pdf

 Stendend conditions the semanaria stele 2m (6.6)

Standard cord length is approximately 2m (6 ft.).

Power Consumption and Cooling

All information in this section is based on primary power consumptions. The power consumption listed in the following table are valid for a typical configuration:

- Two processors
- 1 GB memory
- Two hard disk drives
- DVD ROM drive
- Floppy drive
- Graphics card
- One monitor

Table 1-4Power Consumption for Power Saving Modes

Input power consumption ^a	230V/50Hz and 115V/60Hz
Typical operating mode	340 W
Standby mode	160 W
Hibernate mode	< 10 W

a. Approximate values

NOTE

When you turn off your workstation with the power button on the front panel, the power consumption falls below 10W, but is not zero. To reach zero power consumption when the workstation is off, either unplug the workstation from the power outlet or use a power strip with a switch.

For additional information on power-saving features, see your operating system documentation.

Table 1-5Graphics and I/O Slots Power Specifications^a

Type of card	Number of slots available	Maximum power per card	12v (maximum current)	5v (maximum current)	3.3v (maximum current)	-12v (maximum current)
PCI	5	25W per slot	500m A per slot	5 A per slot	7.6 A per slot	100m A per slot
AGP	1	50W	5.17A	2A	13.6A	
Combined PCI and AGP	See note below ^b	110W				

a. AGP Card Specification: 8x AGP Pro50. PCI Specification: PCI 2.2.

b. If an AGP Pro 50 card is installed, the adjacent PCI slot must be kept vacant to allow for cooling.

System Fans and Airflow

The xw8000 workstation includes the following fans:

- One system fan
- One processor heatsink fan for each processor (CPU)

Figure 1-4 Fans



Resetting the Power Supply

If an overload triggers the power supply overload protection, all power is immediately cut. To reset the power supply unit:

- 1. Disconnect the power cord.
- 2. Determine what caused the overload, and fix the problem.
- 3. Reconnect the power cord, and reboot the workstation.

When you power down the workstation through the operating system, power consumption falls below the low power consumption, but doesn't reach zero. This on/off feature extends the life of the power supply.

Environmental Specifications				
Storage humidity	90% (relative, non-condensing)			
Operating humidity	15% to 80% (relative, non-condensing) at 35° C (95° F)			
Storage temperature	-40° C (-40° F) to 70° C (158° F)			
Operating temperature	5° C (41° F) to 35° C (95° F)			
Altitude	• Operating: 0 to 10,000 ft. (3100 m)			
	• Non-operating: 0 to 15,000 ft. (4500 m)			
Shock	• Operating: 20 G peak, half-sine, 2-3 ms			
	• Non-operating: 80 G peak, half-sine, 2-3 ms			
Vibration	Operating random vibration: Power spectral density (~0.21 G RMS), 5–500Hz			
	• Non-operating random vibration: Power spectral density (~2.09 G RMS), 5–500Hz			
	• Non-operating sinusodial vibration: 0.5 G (0 to Peak), 5 to 500 Hz			
Acoustics	• $+5^{\circ}$ to $+25^{\circ}$ C: L _{WA} less than 5.0 Bels			
	• $+25^{\circ}$ to $+35^{\circ}$ C: L _{WA} less than 5.5 Bels			

Environmental Specifications

Where to Get Help

HP Customer Care Centers can help you solve problems related to HP products, and, if necessary, initiate appropriate service procedures. Support is available on the web and by phone.

Contacting HP Customer Care

For information on contacting HP Customer Care, see the *Worldwide Limited Warranty and Technical Support Guide* provided with your system, or go to:

www.hp.com/go/bizsupport

Information You Need

Before you contact support, please:

- 1. Collect the:
 - Workstation model number
 - Serial number
 - Product number (if applicable)
- 2. Be familiar with your system configuration and note any errors that have occurred. For example:
 - When did the problem start?
 - Have you made any recent changes to the system?
 - What BIOS version is installed? (At boot up, press Esc to display the BIOS ID.)
 - Have you made any recent changes to the BIOS settings?
 - How much memory is installed? Is it HP or third-party memory?
 - What accessory card slots and IRQs are being used?
 - What OS is installed on the system?
 - Have you changed to a different OS? If so, what OS and version?
 - Is the OS giving any error messages?
 - Are there any POST errors? (Displays on screen during boot. See "Understanding Power-on-Self-Test messages" on page 96 for a list of common POST errors and recommended solutions.)
 - Are there any e-buzzer errors? (Audible beeps during boot. See "Troubleshooting with the e-buzzer" on page 98 for a list of e-buzzer beep sequences and recommended solutions.)
- 3. Use this manual and attempt to solve the problem.
- 4. Get the e-buzzer error and try to solve the problem according to the solutions suggested in the table.
- 5. Use the diagnostic software on your system to generate a support ticket. See the hp workstation xw8000 Getting Started Guide provided with your system for detailed instructions.

Online Support, Drivers and Documentation

Go to www.hp.com/go/bizsupport to obtain online support information, and:

- BIOS updates (including the upgrade utility and instructions)
- The latest drivers and software utilities
- Additional documentation

Installation Poster - basic information on setting up your new workstation

- *Getting Started Guide* (this document) information on setting up and configuring your new workstation, along with basic troubleshooting information
- *Technical Reference Guide* detailed information on installing and replacing parts, troubleshooting, and configuring the workstation
- *Illustrated Parts Map* list of supported parts and accessories and a table of basic BIOS settings and menus
- Safety and Comfort Guide information on using your workstation safely and avoiding injury or discomfort
- *Worldwide Limited Warranty and Technical Support* warranty for your workstation and information on contacting HP Customer Care
- *Recovery CD Instructions* detailed instructions on restoring your OS if you need to restore the workstation to the original shipping configuration (recovery instructions available on CD sleeve only)

After accessing the site, select the appropriate hardware. Selected publications are also available as printed books.

2 Installing or Replacing Parts and Accessories

Overview

This chapter contains the following sections:

- "Internal Components" on page 25 shows the locations of components on the system board. Refer to it to locate components.
- "Remove/Replace Prerequisites" on page 26 provides information you **must** know before you remove components.
- "Removing and Replacing Covers" on page 27 explain tasks you perform for many remove/replace procedures.
- The remaining sections explain how to remove and replace components:
 - Memory Modules, page 31
 - Accessory and Graphics Cards, page 34
 - Hard Drives, page 38
 - Optical Drives, page 44
 - Floppy Drive, page 46
 - Power Supply, page 48
 - System Fan, page 51
 - Control Panel Assembly, page 53
 - Front Panel Connectors, page 57
 - Processor and Heatsink, page 59
 - System Board, page 66
 - System Battery, page 70

For a complete list of components and part numbers, see the *HP Workstation xw8000 Illustrated Parts Map*.

For updated information about available graphics cards, drives, and accessories, go to:

www.hp.com/go/bizsupport

NOTE Check your configuration every time you install, remove, or upgrade an accessory. For instructions on how to check your configuration using the HP Setup program, refer to the *Getting Started Guide* that came with your workstation.

Internal Components

Figure 2-1 shows the system board layout.

Figure 2-1 xw8000 System Board



Remove/Replace Prerequisites

Before you remove or replace parts, you must:

- Read the power and EMI warning and note below. (Your safety is important!)
- Gather your tools.
- Follow electrostatic discharge (ESD) precautions.

Read the Power and EMI Warning and Note

WARNING	For the installation and removal procedures in this chapter, you must:		
	• power off the workstation, and		
	• unplug the workstation power cord from the AC power outlet.		
NOTE	To maintain FCC Electromagnetic Interference (EMI) compliance, verify that all covers are replaced and that all screws are properly seated.		

Gather Your Tools

Most tasks do not require tools. To remove or replace components with screws, use either a:

- Flat blade screwdriver, or
- T-15 Torx driver

Follow Electrostatic Discharge (ESD) Precautions

To prevent damage to the system, observe the following ESD precautions when you remove or replace parts:

- Work on a static-free mat.
- Wear a static strap to ensure that any accumulated electrostatic charge is discharged from your body to ground.
- Create a common ground for the equipment you are working on by connecting the static-free mat, static strap and peripheral units to that piece of equipment.
- Keep uninstalled printed circuit boards in their protective antistatic bags.
- Handle printed circuit boards by their edges after you remove them from their protective antistatic bags.

Removing and Replacing Covers

To upgrade, remove or replace system components, you must first remove the side cover, and sometimes the front bezel.

WARNING Always turn the system off and unplug the power cord from the outlet or Power Protection Device before you remove the covers. Always replace the cover(s) before you turn on the workstation.

Removing the Side Cover

To remove the side cover:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. If necessary, unlock the cover on the side of the workstation.

The cover keys are attached to the back panel of the system.

- 3. Pull out on the latch to release the cover.
- 4. Tilt the cover open, then lift it off.

Figure 2-2 Opening the Side Cover



NOTE

Removing the Front Bezel

NOTE Remove the front bezel only when you add or remove devices in the front drive bays or replace front-panel connectors.

To remove the front bezel:

- 1. Remove the side cover.
- 2. Gently lift the three plastic tabs on the left side of the bezel.

Figure 2-3Front Bezel Tabs





3. Rotate the bezel off the workstation chassis.

Replacing the Side Cover and Front Bezel

To replace the cover and front bezel:

- 1. Ensure that all internal cables are properly connected and safely routed.
- 2. If necessary, replace the front bezel:
 - a. Align the plastic quarter rounds on the inside of the bezel with the sheet metal sockets on the right side of the chassis.

Figure 2-4 Bezel Alignment



b. Rotate the bezel into position and verify that the plastic tabs on the left side of the bezel click into position on the workstation chassis. The bezel should be flush against the workstation.

- 3. Lower the cover onto the chassis (aligning the guide rail on the bottom inside edge of the cover with the bottom edge of the workstation chassis).
- 4. Close the cover.

Figure 2-5Aligning and Closing the Cover



5. If desired, lock the cover using the key provided.

Memory Modules

The hp xw8000 workstation memory features include:

- 6 memory slots for DIMMS
- 256 MB to 4 GB memory capacity (memory capacity could increase when 2 GB DIMMS are available; maximum capacity will depend on OS support)
- Dual channel registered DDR 266
- 128, 256, 512 MB DIMMs, or 1GB stacked DIMMs
- DIMMs must be installed in pairs

NOTE Use only HP DIMMs specifically designed for your workstation model. For a complete list of supported memory modules, see the *Illustrated Parts Map* or go to www.hp.com/go/bizsupport.

Removing Memory Modules

To remove a memory module:

1. Turn off the system, disconnect all cables, and remove the side cover (page 27). Place the workstation on its side with the system board facing up.

CAUTION To ensure that memory modules are not damaged during removal or installation, power off the workstation and unplug the power cord from the AC power outlet. Wait until the LED on the back of the power supply turns off before removing memory. If you do not unplug the power cord while installing memory, your memory modules may be damaged and the system will not recognize the memory changes.

2. Press down on the memory module's retainer clips and lift the module by its left and right edges out of its memory slot.

Figure 2-6 Memory Module Retainer Clips



- 3. If the removed memory is functional, store it in a static-free container for future use.
- 4. Replace the system covers, reconnect all cables, and turn on the system.

Installing Memory Modules

Memory modules must be loaded in valid configurations:

- You must load DDR SDRAM as matched pairs. For example, if you place a memory module of 1 GB in one slot of memory module pair 1, you must also insert a 1 GB module in the second slot of the pair.
- Load memory module pair 1 first, pair 2 second, and pair 3 last.
- Load the memory module pairs in order of size, from smallest to largest, beginning with memory module pair 1. For example, if you have 3.5 GB of memory comprised of two 256 MB modules, two 512 MB modules and two 1 GB modules, load the 256 MB modules in memory module pair 1, the 512 MB modules in pair 2, and the 1 GB modules in memory module pair 3.

Figure 2-7 Memory Loading Order



To install or replace memory modules:

1. Turn off the system, disconnect all cables, and remove the system cover (page 27). Place the workstation on its side with the system board facing up.

CAUTION

To ensure that memory modules are not damaged during removal or installation, power off the workstation and unplug the power cord from the AC power outlet. Wait until the LED on the back of the power supply turns off before installing memory. If you do not unplug the power cord, your memory modules can be damaged and will not be recognized by the system. 2. Hold the memory module by its left and right edges, then insert the module into the slot. The memory modules are keyed and can only be inserted in one direction. Be careful to align the notch on the module with the key on the connector.

Figure 2-8 Inserting Memory Modules into Pair 1



- 3. When the module is correctly seated, the retainer clips return to their fully upright position. Snap the clips firmly into place to ensure that the DIMMs are seated properly.
- 4. Replace the system covers, reconnect all cables, and turn on the system.
- 5. Start the workstation. Press **Esc** when prompted to check the **Summary Screen**, and verify the new configuration.

Accessory and Graphics Cards

Removing an Accessory or Graphics Card

NOTE Uninstall the driver for the old graphics card before you install a new graphics card. This eliminates a warning when the old driver tries to load in the operating system.

To remove a card:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover (page 27).
- 3. Remove any cables connected to the card on the rear panel.
- 4. Place the workstation on its side with the system board facing up.
- 5. Remove the AGP Card Support Assembly, if applicable:
 - a. Squeeze the two sides of the retainer to release the locking mechanism from the chassis.
 - b. Rotate the retainer and lift it out of the system.

Figure 2-9 AGP Card Support Assembly

A. Squeeze

B. Rotate and lift





6. Open the PCI retainer by pressing down on the two green clips at the ends of the retainer and rotating the retainer towards the back of the system.

Figure 2-10PCI Retainer Clips (inside of case)



If it is difficult to disengage the green clips, press the outside of the clips from the rear of the chassis while disengaging.

Figure 2-11 PCI Retainer Clips (outside of case)



7. For full-length cards, disengage the front of the card from the card guide by removing the screw and releasing the card guide locking clip.

Figure 2-12 Full-length Card Guide





Release the locking clip

8. Grasp the bulkhead end of the card and its opposite edge and lift the card out of the slot. Store the card in a static bag.

Figure 2-13 Removing a Card



9. If you are not going to install a new card in that slot, insert a bulkhead blank and snap the PCI retainer into place.

Installing a Graphics or Accessory Card

To install a new card:

- 1. Remove the existing card (page 34) or bulkhead blank in the slot you want to use.
- 2. Grasp the bulkhead end of the card and its opposite edge and insert the card into its connector.
- 3. Align the new card carefully and slide it into position. Press it into the slot.
| CAUTION | If an AGP Pro 50 card is installed, the adjacent PCI slot must be kept vacant to allow for cooling. | | | | |
|---------|---|--|--|--|--|
| | 4. Snap the PCI retainer into place, pressing from the outside of the chassis to close the retainer (Figure 2-11 on page 35). | | | | |
| | 5. Replace the AGP Card Support Assembly, if applicable. (The AGP Card Support Assembly will be supplied with card if needed.) | | | | |
| | 6. Replace the workstation cover and reconnect all cables. | | | | |
| | 7. Start the workstation. When prompted, press Esc to view the Summary Screen and verify the new configuration. | | | | |
| NOTE | If you have installed a different graphics card, you must also install new drivers for that card. See the documentation that came with your card and your OS manual for information on installing new drivers and configuring video settings. | | | | |
| | Refer to the graphics documentation provided at www.hp.com/go/bizsupport or with your graphics card kit for more information. | | | | |
| | | | | | |

Booting from a PCI Device

To boot from a PCI device, such as a Network card, enable **OPTION ROM loading/scanning** for the PCI slot used. If you do not enable **OPTION ROM loading/scanning** for the slot, the system will be prevented from using the device installed in that slot as a bootable device. See page 76 for instructions on configuring PCI devices.

Hard Drives

Your workstation has *either* IDE or SCSI hard drives (both types can not be installed in the same system). You can connect either:

- One to five SCSI drives using the integrated SCSI controller, or
- One or two IDE drives using the integrated IDE controller

CAUTION Back up your files before removing or installing a hard disk drive.

Removing a Hard Drive

To remove a hard drive:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover (page 27).
- 3. Place the workstation on its side with the system board facing up.
- 4. Remove the power and data (IDE or SCSI) cables from the drive.

Figure 2-14 Hard Drive Cables



Power cable



Data cable (SCSI)

5. Place your fingers on the colored release clips on the sides of the drive, and squeeze inward. Pull gently just enough to release the drive rail latches.



Figure 2-15 Hard Drive Rails

- 6. Grasp the hard drive with your hand and pull out.
- The drive rails are **not** screwed on to the drive. **Do not** hold the drive by the rails when it is not installed in a drive bay, because you could drop and damage the drive.
 - 7. Remove the rails from the drive and insert them into the slots in the drive bay for storage. Store the drive in a static bag.

Figure 2-16 Storing the Drive Rails



NOTE

Installing a Hard Drive

To install a hard drive:

- 1. If you are replacing a drive, remove the existing drive (page 38) in the slot you want to use.
- 2. Connect rails to the new drive:
 - a. If the rails are stored in the drive bay, place your fingers on the colored release clips located on the sides of the drive bay, and squeeze in. Pull gently to remove the rails (Figure 2-16 on page 39).
 - b. If the rails are attached to an old drive, remove them from the drive.
 - c. Attach the rails onto the new drive by inserting the metal clips on the drive rails into the holes in the side of the drive. Attach the rear clip first, then attach the front clip.

Figure 2-17 Attaching Rails to a new Drive



3. Insert the drive into the bay. Load the drives in the order shown in Figure 2-18 (IDE) orFigure 2-19 (SCSI):

CAUTION

Hold onto the hard drive — NOT the rails — when handling the drive.

a. **For IDE drives**, insert the first drive into bay 2 (second from bottom), and the second drive into bay 3 (third from bottom). Press down gently until the drive snaps into place.

Figure 2-18 IDE Drive Loading Order



b. **For SCSI drives 1 through 4**, insert the drive into the next available bay, loading the drives in the order shown below. Press down gently until the drive snaps into place.

 Sth drive mounting screw storage
 Install drives in these bays first

 Sth drive mounting screw storage
 Sth drive mounting screw storage

Figure 2-19 SCSI Drive Loading Order

- c. For SCSI drive 5:
 - Remove the three drive screws from the storage in the system chassis (Figure 2-19 on page 42).
 - Insert the drive.
 - Install the screws, attaching the drive directly to the bottom floor of the workstation. No drive rails are used.

Figure 2-20Installing a fifth SCSI drive



	4. Co	4. Connect the drive cables:			
a. Connect the power cable to the hard driv			power cable to the hard drive (see Figure 2-14 o	on page 38).	
	b.	b. For IDE drives , connect the IDE cable to the drive.			
NOTE		If you purchased a system with IDE hard drives, the system has two IDE cabl Connect the primary IDE connector to the hard drives. Use the secondary IDE connector for optical drives. Make sure you connect them properly.			
	The jumper on the hard drive is should be pre-set to cable select (CSE master (M) or slave (S). The black connector on each cable is for the n device; the gray connector is for the slave device. The blue connector is system board.			elect (CSEC), not to a for the master connector is for the	
	c.	c. For SCSI drives, set the SCSI ID and connect the SCSI cable to the drive.			
NOTE	TE See the documentation provided with your new drive to determine to settings required to set the SCSI ID. Using the jumpers provided, s ID on the jumper block located on the drive.			ermine the jumper vided, set the SCSI	
		There is no need to terminate the SCSI chain. The supported SCSI cable includes an attached hardware terminator.			
Table 2-1	SCSI IDs				
		SCSI ID	Used By		
		0	First SCSI hard drive	•	
		1-4	Optional additional SCSI hard drives	•	
		5-6	Unused		
		7	SCSI controller		

8-15

Unused

- 5. Replace the workstation cover (page 29) and reconnect all power cables and any LAN or telecommunications cables.
- 6. Start the workstation and check the **Summary Screen** by pressing **Esc** when prompted to verify the new configuration.

Optical Drives

The optical drives in the xw8000 workstation are IDE devices.

Removing an Optical Drive

To remove an optical drive:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover and front bezel (page 27).
- 3. Remove the power, IDE and audio cables from the drive.

Figure 2-21 Optical Drive Cables



4. Remove the drive:

- a. Release the drive by rotating the drive release lever.
- b. Slide the drive out the front of the chassis.

Figure 2-22Removing an Optical Drive

A. Rotate the lever

B. Slide the drive out



5. Install a replacement drive (page 45).

Installing an Optical Drive

To install an optical drive:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover and front bezel (page 27).
- 3. Use your finger to pull the 5.25-inch metal filler plate from the chassis if necessary.
- 4. Insert the drive:
 - a. While holding the drive release lever out, slide the drive into the chassis.
 - b. Release the lever so the drive clicks into position.

Put your master device in the top bay and your slave device in the lower bay.

Figure 2-23 Inserting an Optical Drive



- 5. Connect the power, IDE, and audio cables to the rear of the new drive (see Figure 2-21 on page 44).
- **NOTE** If you purchased a system with IDE hard drives, the system has two IDE cables. The secondary IDE connector should be used for optical drives. Make sure you connect them properly. The jumper on the optical drive is should be pre-set to cable select (CSEC), not to master (M) or slave (S). The black connector on each cable is for the master device; the gray connector is for the slave device. The blue connector is for the system board.
 - 6. If necessary, remove the plastic cover piece from the workstation's bezel that corresponds to your new drive before attaching the bezel and front cover (page 29).
 - 7. Reconnect all the power and telecommunications cables.
- **NOTE** If you installed a CD-RW or DVD+RW/+R, you must install the software that came with the drive before you can write to the device or play DVD movies. The CD-ROM driver is pre-loaded and is used by the CD-ROM, CD-RW, and DVD drives to read standard CD-ROM format media.

Refer to the *HP Workstation xw8000 Getting Started Guide* provided with your system for installation instructions.

NOTE

Floppy Drive

Removing a Floppy Drive

To remove a floppy drive:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover and front bezel (page 27).
- 3. Remove the power and data cables from the drive.

Figure 2-24 Floppy Drive Connectors



- 4. Remove the drive:
 - a. Release the drive by pulling the drive release lever.
 - b. Slide the drive out the front of the chassis.

Figure 2-25Removing the Floppy Drive



- A. Pull lever
- B. Slide drive out

5. Install a replacement drive (page 47).

Installing a Floppy Drive

To install a floppy drive:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover and front bezel (page 27).
- 3. Remove the old floppy drive from the bay.
- 4. Insert the drive:
 - a. While holding the drive release lever out, slide the drive into the chassis.
 - b. Release the lever so the drive clicks into position.

Figure 2-26 Inserting a Floppy Drive



- 5. Connect the power and data cables to the rear of the new drive (see Figure 2-24 on page 46).
- 6. Replace the bezel and front cover (page 29).
- 7. Reconnect all the power and telecommunications cables.

Power Supply

WARNING

Hewlett-Packard does not support power supply upgrades. This information is provided to help you replace a defective power supply unit. For your safety, only use a power supply provided by HP support services.

Removing the Power Supply

To remove the power supply:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover (page 27).
- 3. Place your workstation on its side with the system board facing up.
- 4. Unplug all internal power supply connectors:
 - floppy drive, see Figure 2-24 on page 46
 - hard drive(s), see Figure 2-14 on page 38
 - optical drive(s), see Figure 2-21 on page 44
 - system board power connectors

Figure 2-27 xw8000 System Board Power Connectors



5. Remove the four screws located on the rear of the chassis that secure the power supply unit in position.



Figure 2-28 Power Supply Mounting Screws

6. Push the supply unit forward until it is clear of the mounting hooks and remove it from the chassis.

Figure 2-29 Removing the Power Supply



Replacing a Power Supply

To replace a power supply:

- 1. Remove the old power supply (page 48).
- 2. Insert the new power supply unit, lining up the mounting bracket on the back of the power supply with the associated chassis feature, then slide the power supply toward the rear of the chassis.
- 3. Secure the power supply to the back of the chassis using the four screws you previously removed (Figure 2-28 on page 49).
- 4. Reconnect all internal power supply connectors (Figure 2-27 on page 48).
- 5. Return the workstation to its upright position.
- 6. Replace the cover (page 29).
- 7. Reconnect all the power and telecommunications cables.

System Fan

Removing the System Fan

To remove the system fan:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover (page 27).
- 3. Place your workstation on its side with the system board facing up.
- 4. Disconnect the fan connector from the system board, noting where it was plugged in so you can plug the replacement into the same slot.

Figure 2-30 Disconnecting the Fan



5. Holding the fan with one hand, press the retaining clip at the top of the fan to release it, then rotate the fan forward to release. Lift the fan out of the chassis.

Figure 2-31 Fan Retainer Clip



Installing a System Fan

NOTE The workstation ships with one system fan. An optional front fan may be added after purchase. To install a second fan, follow the instructions provided with fan.

To install the system fan:

- 1. Remove the old fan (page 51).
- 2. Ensure that all cables are clear of the fan and will not easily come into contact with the fan during normal use or following transportation.
- 3. The fan unit can only be installed in one way. Align the tabs at the bottom of the fan with their corresponding holes on the chassis.

Figure 2-32 Aligning the Fan



- 4. Gently push the fan forward, making sure the round tabs are aligned with the holes on the chassis, until it clicks into place.
- 5. Connect the fan connector to the system board, making sure it is in correct connector.

Figure 2-33 System Fan Connector



6. Replace the cover (page 29). Reconnect all the power and telecommunications cables.

Control Panel Assembly

The control panel assembly on the front of the system includes:

- power button
- reset button
- power and disk-access LEDs
- internal system speaker
- chassis intrusion switch

Removing the Control Panel Assembly

To remove the control panel assembly:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover and front bezel (page 27).
- 3. Place the workstation on its side with the system board facing up.
- 4. Remove the control panel cable from the system board.

Figure 2-34 Control Panel Connector



- 5. Remove the assembly components from the chassis:
 - a. Speaker: Unplug the speaker from the rest of the assembly and push it out of position. The speaker is held by four clips and one bump. Push in the direction of the bump to remove.

NOTE

Remove the speaker only if you plan to replace it. You can re-use the old speaker with a new control panel assembly.

Figure 2-35 **Removing the Speaker**

Unplug the speaker



b. Chassis intrusion switch: The switch is held in place by two plastic tabs that are accessible through holes in the top and bottom of the intrusion switch bracket. Depress the tabs with a screw driver, and push the button down and out of the bracket.

The plastic housing that holds the intrusion switch has a small slit in the side. Feed the wires through the slit to remove this housing from the intrusion switch.

Figure 2-36 **Removing the Chassis Intrusion Switch**

Locate the switch

Remove from housing

Feed wires through slit





c. *Front panel controls:* Remove the screw holding the front control panel to the chassis and lift the panel off of the chassis. Gently pull all the wires in front of the hard drive cage and through the hole where the front control panel was attached.

Figure 2-37Removing the Control Panel Assembly



Installing the Control Panel Assembly

To install the control panel assembly:

- 1. Remove the old assembly (page 53).
- 2. Attach the assembly components to the chassis:
 - a. *Chassis intrusion switch:* Remove the switch housing from the switch/wire (reverse of above), then slide the switch through the hole where the front panel connectors were attached and through the opening in front of the hard drive bays. Re-install the switch housing, then Insert the switch into the bracket until it clicks (Figure 2-36 on page 54).

Feed the control panel and speaker wires in front of the hard drive cage and into position. You must unplug the speaker from the rest of the assembly before feeding the wires into the chassis.

- b. *Front panel controls:* Insert the front panel into the slot on the chassis and attach the screw holding the front panel controls to the chassis (Figure 2-37 on page 55).
- c. *Speaker:* Attach the speaker to the chassis by sliding it in over the bump until it snaps into place (Figure 2-35 on page 54). Plug the speaker in to the assembly.
- 3. Plug the control panel cable into the system board (Figure 2-34 on page 53).
- 4. Return the workstation to its upright position.
- 5. Replace the cover (page 29).
- 6. Reconnect all the power and telecommunications cables.

Front Panel Connectors

The front panel connectors include:

- IEEE-1394 FireWire port
- Two USB connectors
- Headphone and microphone jacks

Removing the Front Panel I/O Assembly

To remove the front panel I/O assembly:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover and front bezel (page 27).
- 3. Place the workstation on its side with the system board facing up.
- 4. Unplug the front USB/audio cable and the IEEE-1394 FireWire cable from the system board.

Figure 2-38 Front Panel I/O Assembly Connectors



5. Unscrew the screw holding the front panel I/O assembly to the chassis and lift the panel off of the chassis.

Figure 2-39 Front I/O Assembly Screw



6. Gently pull the wires through the hole where the I/O assembly was attached.

Figure 2-40 Threading the I/O Assembly Wires



Installing the Front Panel I/O Assembly

To install front panel I/O assembly:

- 1. Remove the old assembly (page 57).
- 2. Feed the wires into the hole (Figure 2-40 on page 58).
- 3. Insert the front panel into the opening on the front of the chassis. Attach the screw holding the front panel controls to the chassis (Figure 2-39 on page 58).
- 4. Plug the front USB/audio and IEEE-1394 FireWire cables into the system board (Figure 2-38 on page 57).
- 5. Return the workstation to its upright position.
- 6. Replace the cover (page 29).
- 7. Reconnect all the power and telecommunications cables.

Processor and Heatsink

This section explains how to remove and replace a heatsink and processor on a one- or two-processor system board.

NOTE If you are upgrading your processor, you must update the system BIOS. Download the latest BIOS from www.hp.com/go/bizsupport.

If you are adding or permanently removing a second processor, check your OS documentation to determine if you should change any OS settings to enable multiprocessor or hyperthreading support. See the instructions provided with the processor kit for more information.

Removing a Heatsink

You must remove the heatsink when you remove any of these components:

- processor (page 61)
- system board (page 66)
- floppy drive data cable (page 46)
- optical drive IDE cable (page 44)

CAUTION You MUST let the workstation run for five minutes before you remove the processor. This warms up the thermal interface material between the heatsink and processor to loosen the thermal bond. If you remove the heatsink while the thermal pad is cold, you could lift the processor out of the socket, even if the socket is closed. This could damage the processor and the processor socket.

To remove a heatsink:

- 1. Turn on the system for five minutes to loosen the adhesion between the heatsink and the processor.
- 2. Shut down the workstation and turn off the display. Disconnect all power cables.
- 3. Remove the side cover (page 27).
- 4. Place the workstation on its side for better access.
- 5. Remove the processor heatsink fan connector from the system board.

Figure 2-41 Heatsink Fan Connectors



- 6. Remove the processor heatsink:
 - a. Loosen the four captive processor heatsink screws by unscrewing one pair of diagonally opposite screws, then unscrewing the remaining pair (Figure 2-42).
 - b. Gently twist the heatsink to break the thermal bond and release the heatsink from the processor, then carefully lift the heatsink off of the processor.

CAUTION

Handle the heatsink and processor very carefully. Thermal interface heat transmission is reduced if the heatsink thermal interface surface is scratched.

Figure 2-42 Removing the Processor Heatsink



A. Remove four screws in diagonally-opposite pairs



B. Lift out the processor heatsink

Removing a Processor

To remove a processor:

- 1. If you have not already done so, remove the heatsink (page 59).
- 2. Remove the processor:
 - a. Raise the lever on the processor socket to release the pins.
 - b. Pull the processor straight out of the socket.

Figure 2-43 Processor Socket Release Lever



A. Raise the lever



B. Pull out the processor

CAUTION

Handle the processor carefully. To avoid bending the processor pins, keep the processor perfectly flat when removing and storing it.

NOTE

Store the processor in a safe place where it will not be damaged.

If you are permanently removing a second processor, check your OS documentation to determine if you should change any OS settings to disable multiprocessor support or enable hyperthreading support.

CAUTION	The processor, heatsink, and thermal interface material are separate parts. If you are installing a new processor, make sure you have all of these parts before you begin.
	To install a processor:
	1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
	2. Remove the side cover (page 27).
	3. Place the workstation on its side for better access.
	4. Remove the old processor (page 61) and heatsink (page 59) if necessary.
	5. Raise the lever of the processor socket (Figure 2-43 on page 61).
	6. Orient the processor by matching the notches on the processor to the notches on the CPU socket.
	7. Carefully lower the new processor into place. When the processor is fully inserted, close the lever.
NOTE	If you are installing a single processor, place it in the CPU socket labeled CPU1 (see Figure 2-1 on page 25).
CAUTION	Be extremely careful when you insert the processor. If you bend one of the pins, it will not go into the socket.

Installing a Processor

Figure 2-44 Aligning the Processor



8. Replace the heatsink (page 63) or install a new heatsink (page 65).

Replacing a Heatsink

To replace a heatsink that has been removed:

1. Use alcohol and a soft cloth to clean all of the thermal interface material residue from the heatsink and processor.

CAUTION

NOTE

Allow the alcohol on the processor and heatsink to dry completely.

Figure 2-45 Cleaning the Processor and Heatsink



2. Affix the thermal grease to the processor. Apply all of the grease in the center of the processor.

The thermal grease has a one-year shelf life. Make sure your thermal grease has not expired.

Figure 2-46 Thermal Interface Material



- 3. Carefully push the system board back against the rear of the chassis, making sure the processor heatsink mounting holes in the system board line up with the threaded standoffs in the chassis.
- 4. Replace the processor and heatsink:
 - a. Place the heatsink on top of the processor and align the four mounting screws with the holes in the system board.

b. Attach the four captive processor heatsink screws:

While carefully holding the system board back against the rear of the chassis, screw in the four processor screws slowly, making sure to tighten all the screws evenly. Tighten one pair of diagonally opposite screws until the screw shank settles on the system board, then tighten the remaining pair. Do not fully tighten one screw, then move on to the next. Tighten all of the screws a little at a time, making sure the processor remains level. If using a torque driver, tighten the screws to 6 ins-lbs.

Figure 2-47 Replacing the Processor and Heatsink



B. Attach the screws in diagonally-opposite pairs

- 5. Connect the heatsink fan connector to the system board (Figure 2-41 on page 60).
- 6. Repeat to install or replace a second processor or heatsink.

and heatsink

NOTE

If you added a second processor, check your OS documentation to determine if you should change any OS settings to enable multiprocessor or hyperthreading support. See the instructions provided with the processor kit for more information.

7. Replace the cover (page 29) and reconnect all power and telecommunications cables.

Installing a New Heatsink

To install a new heatsink:

	1. Use alcohol and a soft cloth to clean all of the thermal grease residue or thermal pad adhesive from the processor (Figure 2-45 on page 63).				
CAUTION	Allow the alcohol on the processor and heatsink to dry completely before installation.				
	2. Carefully push the system board back against the rear of the chassis, making sure the processor heatsink mounting holes in the system board line up with the threaded standoffs in the chassis.				
	3. Replace the processor and heatsink:				
	a. Place the heatsink on top of the processor and align the four mounting screws with the holes in the system board.				
	b. Attach the four captive processor heatsink screws. Tighten one pair of diagonally opposite screws until the screw shank settles on the system board, then tighten the remaining pair. See Caution and Figure 2-47 on page 64.				
	4. Connect the heatsink fan connector to the system board (Figure 2-41 on page 60).				
	5. Repeat steps 1-5 to install a second processor or heatsink.				
	6. Replace the cover (page 29) and reconnect all the power and telecommunications cables.				
NOTE	If you added a second processor and are running MS Windows 2000, you must upgrade the Hardware Abstraction Layer (HAL) kernel from an ACPI Uniprocessor PC to an ACPI Multi-processor PC. Go to www.microsoft.com/support for instructions.				
NOTE	A Quick Cooler Tower is required on Dual Processor Systems (both heatinks) with 2.8GHz or greater frequency processors. This part is supplied with the Processor Assembly.				

System Board

Removing the System Board

To remove the system board:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover (page 27).
- 3. Place the workstation on its side for better access.
- 4. Remove the following cables and components (see Figure 1-3 on page 14 and Figure 2-1 on page 25):
 - IDE and SCSI (if applicable) connectors

NOTE

Disconnect cables from the system board and leave them in the chassis. Do not disconnect them from the devices.

- AGP Card Support Assembly (if applicable)
- Accessory and graphics cards
- CD audio cable
- Control panel, front USB/audio and IEEE-1394 FireWire connectors
- Power cables
- System Fan and housing
- Power and data cables from floppy drive
- 5. The processor screws attach the system board to the chassis. Remove the heatsink(s) (page 59) and processor(s) (page 61) from the system board.

- 6. Remove the system board:
 - a. Slide the system board forward to disengage the plastic mounting standoffs from the chassis.
 - b. Lift the system board out of the chassis, being careful not to damage the workstation's cables and rear panel connectors.

Figure 2-48 Removing the System Board





Slide the system board forward

Installing the New System Board

To install a new system board:

- 1. After removing the old system board, clear all cables from the area where the system board will sit.
- 2. Align the system board mounting with the corresponding slots in the chassis, and insert the board.

Figure 2-49 Aligning the System Board



Back of system board



- 3. Press down on the board to ensure all hooks are correctly positioned, then gently slide the system board towards the rear of the chassis. Check that all standoffs are engaged in their respective slots and that the rear panel connectors are correctly aligned with the rear EMI gasket.
- CAUTION

If you have problems getting the hooks to seat properly, don't force them. Check to see if anything has crept under the system board. There should be two cables under the system board. Remove anything else that may interfere with system board installation.

When inserting the system board, be careful not to damage or bend the metal hooks on the rear connector EMI shield. If the shield is damaged it can be very difficult to install the system board correctly.

- 4. Replace the processor(s) (page 62) and heatsink(s) (page 63). This attaches the system board to the chassis.
- 5. Reconnect any cables you disconnected from the system board.

6. Set the system board switches, if necessary.

Figure 2-50 System Board Switch Location



Table 2-2System Board Switch Settings

Switch	Default Position	Purpose
1	OFF	Clear password. See "You Forgot Your Password" on page 98.
2	OFF	Crisis recovery. See "Recovering the BIOS from the Boot Block" on page 82.
3	OFF	Clear CMOS. See "Clearing the CMOS" on page 81.
4	OFF	Reserved

7. Return the workstation to its upright position and replace the side cover (page 29).

8. Connect all the power and telecommunications cables.

NOTE After installing the system board, you must update your BIOS. The latest BIOS and firmware for your workstation are available at www.hp.com/go/bizsupport.

System Battery

If your workstation repeatedly loses its configuration settings, consider changing the battery. Replace it with a CR2032 coin type manganese/lithium battery, available from most electronics or computer stores.

WARNING

Installing the battery incorrectly could cause an explosion. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. The battery is a lithium battery which does not contain heavy metals. Nevertheless, in order to protect the environment, do not dispose of batteries in household waste. Please return used batteries to the shop from which you bought them, or to the dealer from whom you purchased your workstation, or to HP, so that they can be either recycled or disposed of in an environmentally sound way. Returned batteries will be accepted free of charge.

Removing the Battery

To change the battery:

- 1. Shut down the workstation and turn off the display. Disconnect all power cables and any LAN or telecommunications cables.
- 2. Remove the side cover (page 27).
- 3. Remove the old battery by pressing the vertical spring tab near the edge of the battery. Push it out and away from the battery to release the battery.

Figure 2-51 Battery Location



Installing the Battery

To install the new battery:

- 1. Place the new battery in the battery holder and ensure that it is properly seated. Ensure that the clip holds the battery firmly in place.
- 2. Replace the side cover (page 29) and reconnect all cables and power cords.
- 3. Run the HP Setup Program to configure the workstation (page 74).

Installing or Replacing Parts and Accessories **System Battery**
System Configuration and Monitoring

This chapter contains information on:

- Configuring your Workstation with the HP Setup Program, page 74
- BIOS Features and Specifications, page 79
- Hardware Monitoring, page 83

Configuring your Workstation with the HP Setup Program

Starting the HP Setup Program

The Setup program lets you configure your workstation. You can:

- Set up the system administrator and user passwords
- Change the system boot order
- Solve configuration problems

HP recommends you note any changes you make to the system setup for later reference.

To start the Setup program:

- 1. Start your workstation. If your workstation is already up, shut it down and restart.
- 2. Press F2 while F2 Setup is displayed at the bottom of the screen. If you fail to press F2 in time and the start-up process continues, you must allow your system to finish booting up, then restart your workstation and go through the Power-On-Self-Test (POST) again.

The opening screen of the Setup program appears:

- A band along the bottom of the screen gives instructions on using the keyboard-driven menus:
 - F1: Help
 - F7/F8: Change value
 - F9: Return to system configuration to default
 - F10: Return to previous value
 - Up/Down arrow keys: Highlight an item or menu
 - Enter: Select an item or menu
 - Esc: Exit
- A band along the top displays the menus. For more information on the menus, see:
 - "Main Menu" on page 75
 - "Advanced Menu" on page 75
 - "Security Menu" on page 76
 - "Boot Menu" on page 78
 - "Power Menu" on page 78

Main Menu

The Main Menu contains the following options:

- **BIOS Version:** This view-only field displays your current BIOS version. You can compare this to the most recent available BIOS located at www.hp.com/go/bizsupport.
- **Operating System:** This field indicates the currently selected operating system. The BIOS needs this information to understand how to handle Plug-and-Play configuration and Quick Boot. If you are using several incompatible operating systems and don't want top modify this field every time you run a different one, select the default Other option.
- **Reset Configuration Data:** When you reset configuration data, the BIOS dynamically reallocates resources (IRQs, I/O, memory) to cards and motherboard devices at the next boot. It then sets this field back to No. You would not select Yes and choose to reset your configuration data unless you were having problems with your workstation.
- System Time: The system time format is based on a 24-hour clock.
- System Date: The system date format is mm/dd/yyyy.

Advanced Menu

The Advanced menu contains the following functions and submenus:

- **Processors:** Displays the type and speed of the workstation processor(s). To change your processor speed in the Processor Speed field, select a value from the drop-down menu. Your processor cannot run faster than what is displayed in the Current Type field. If you leave Processor Speed set to the default of Auto, the processor speed is automatically detected. Use a fixed frequency for troubleshooting only.
- Chipset:
 - Memory Error Checking: You can choose between ECC and Disabled. ECC scrubbing checks for and corrects errors at the source to prevent them from recurring. Change this field to Disabled if you want to find errors, but don't want them corrected.
 - ECC Error Type: When an ECC error occurs, it generates an interrupt. In this field, you can select the type of interrupt you want reported: NMI (Non-Maskable), SMI (System Management), SCI, (System Control), or None.
 - SERR signal condition: You can select the type of ECC error condition that triggers a critical system error (SERR#). Normally, only Multiple bit (unrecoverable) errors should be able to trigger SERR#. But you can also choose Single bit, None, or Both.
- **Floppy Disk Drive:** Contains the floppy disk drive type and controller fields. If you choose to disable your floppy disk drive, you must also disable your floppy disk controller.
- **IDE Devices:** This submenu contains fields that let you configure the settings for the IDE controller and any attached IDE devices.

- **Integrated SCSI Controller:** This submenu contains fields that let you configure the settings for the SCSI controller and any attached SCSI devices:
 - Integrated SCSI: Enable or disable the SCSI controller.
 - Option ROM Scan: Enable this option if the SCSI device is used to boot the operating system. If too many option ROMs are enabled, some may not load due to insufficient available shadow memory. Always disable any that aren't needed.
 - Enable Master: The BIOS normally leaves Bus Mastering disabled, and the operating system enables it when starting. Set this field to Enabled if you have a bus-mastering device and the device driver cannot enable bus mastering by itself.
 - Latency Timer: Sets the minimum guaranteed time slice allotted for bus master, expressed in PCI bus clock cycles. The bigger the value, the greater the share of the bus to the device.
- **Integrated Network Interface:** This submenu contains fields that let you configure the settings for the integrated 10.100BT network interface. These fields are identical to the Integrated SCSI Controller fields listed above.
- **Integrated USB:** This submenu contains fields that let you configure the settings for the integrated USB interface. These fields are identical to the Integrated SCSI Controller fields listed above except there is no Option ROM Scan.
- **Integrated I/O Ports:** This submenu contains fields that let you configure both the integrated serial and parallel ports:
 - Serial port or Parallel Port contains three choices:
 - Auto lets the BIOS or a PnP OS configure the port.
 - **Enabled** lets you set each resource.
 - Disabled leaves the port disabled by the BIOS, but a PnP OS can still enable it.
 - **Parallel Port Mode:** You can set the parallel port mode to Output only, Bi-directional, EPP, or ECP.
- **Integrated Audio:** This submenu contains fields that let you configure the integrated PCI audio controller. These fields are identical to the Integrated SCSI Controller fields listed above except there is no Option ROM Scan.
- **AGP Graphics Slot:** This submenu contains fields that let you configure your AGP slot. The first two fields describe the installed graphics card. The Enable Master and Latency Timer fields are described in the Integrated SCSI Controller entry above.
 - **Graphics Aperture:** Contains a pull-down menu that lets you choose the size of the graphics aperture for the AGP video device.
- **PCI Device Slot:** This submenu contains fields that let you configure a PCI device plugged into the specified slot. The first two fields describe the installed PCI card. The next three fields are identical to the Integrated SCSI Controller fields listed above.

Security Menu

The Setup program Security menu includes the following settings:

- Administrator Password: This view-only field tells you whether there is an administrator password set.
- Set Administrator Password: This password prevents unauthorized access to the Setup program. This password can also be used to start the workstation when the power-on password is enabled. You must set an administrator password before you set a user password.
- **Clear All Passwords:** Select this field and press **Enter** to clear both the user and administrator passwords.
- User Password: This view-only field tells you whether there is a user password set.
- **Set User Password:** This password prevents unauthorized access to the Setup program. This password can also be used to start the workstation when the power-on password is enabled.
- **Power-On Password:** If enabled, you must enter a password before the workstation boots.
- **Start from Floppy:** If disabled, unauthorized use of the floppy disk drive to start the workstation is prevented. (The drive is still available for reading and writing data.)
- **Start from CD-ROM:** If disabled, unauthorized use of the CD drive to start the workstation is prevented. (The drive is still available for reading and writing data.)
- **Start from Hard Disk Drive:** If disabled, unauthorized use of the hard drive to start the workstation is prevented. (The drive is still available for reading and writing data.)
- Write on Floppy Disks: If locked, users are prevented from copying information to a floppy disk.
- **Locked Setup Configuration:** If locked, a plug-and-play operating system cannot change the BIOS configuration settings.
- **Hard Disk Boot Sector:** If locked, the boot sector on the hard disk drive is protected against viruses.

Additional Security Feature

Lock Status Panel: The BIOS can lock out the front panel, when necessary, to prevent the user from pressing the power button or the reset button at an inopportune time (such as during a BIOS flash update).

Boot Menu

The Boot menu contains the following functions:

- **QuickBoot Mode:** Skips many Power-On-Self-Test (POST) tasks. The only POST task that is confirmed as skipped at this time is the Floppy seek test. If a chassis-intrusion was detected, an invalid CMOS checksum was encountered, or there was a CMOS battery failure, a full POST is performed regardless of this setting. (CMOS is volatile memory powered by a battery that contains data needed by the BIOS.) Fast POST is a PC99 requirement. The actual boot time consists of:
 - 10 seconds from power-on to bootstrap loading
 - hard disk read time
 - option ROM running time
 - ECC initialization time
- **Display Option ROM Messages:** This feature allows the POST screen to display the Option ROM messages. You should enable it when you install an accessory board, but disable it afterwards.
- **Preferred Video:** If you have two video cards, this field allows you to choose which one to use during boot.
- Boot Device Priority: This submenu lets you select the device boot order.

Power Menu

The Power menu contains the following functions:

- **Remote Power-on:** Lets you enable remote power-on from devices and operating systems that support this feature.
- **Remote Wake-up:** Lets you enable remote wake-up (from hibernate or standby power-saving modes) from devices and operating systems that support this feature.
- After Power Failure: If you experience a power failure, the setting for this field determines the state the workstation returns to when power is restored. Power On turns the workstation on. Stay Off leaves the workstation off and disables remote power-on. Last State restores the state the workstation was in when the power failed.

BIOS Features and Specifications

The xw8000 workstation BIOS is based on the core Phoenix BIOS and is compliant with the following specifications:

- ACPI 1.0
- PCI 2.2
- PnP 1.0a
- DMI 2.0
- WFM 2.0
- MPs 1.4
- PC 99 (fast boot)

The HP BIOS supports:

- As many as six processor microcodes
- Administrator and user passwords
- Configuration summary screen
- Setup program
- Temporary boot priority
- Fast boot
- POST routines

The system ROM contains the Power-On Self-Test (POST) routines and the BIOS: the system BIOS, video BIOS, and low-option ROM. This chapter gives an overview of the following:

- Menu-driven Setup with context-sensitive help.
- POST routines, which are a sequence of tests the workstation performs to ensure that the system is functioning correctly.

Hardware auto-detection. No user input should be needed when new hardware is installed. This assumes no ISA bus.

- 100% auto-configuration, 100% auto-detection, conflict detection and resolution of motherboard and PCI devices
- PCI 2.2 and PnP 1.0a compliant
- "PnP OS" and "non-PnP OS" configuration modes
- Adding and removing add-in cards should not generate errors (this is different from current systems, where **F4** is used to confirm removals)
- Auto-configuration and chipset optimization based on bus speed
- No floppy auto-detection (floppy type must be defined by user during setup, default is 3.5" 1.44 MB for drive A and no floppy for drive B)
- IDE HDD, CD-ROM and DVD auto-detection, including support for IDE drives larger than 8.4 GB

NOTE Some of these steps may be bypassed if the case was not opened, in order to save time. Detection of back-planes and motherboard types is not part of the standard BIOS requirements.

BIOS Version

The system BIOS is identified by the version number aXX.YM.mm, where:

- *a* is an optional one-letter code indicating non-production status
- *XX* is a two-letter code indicating the system
- *Y* is a one-letter code indicating the HP entity
- *M* is the major BIOS version
- *mm* is the minor BIOS version

Updating the System BIOS

You can download the latest system BIOS at **www.hp.com/go/bizsupport**. Instructions for downloading and updating the BIOS are posted on the site and are included as a text file in the downloadable file.

CAUTION Don't turn off the workstation until the system BIOS update procedure has completed, successfully or not; otherwise, irrecoverable damage to the ROM might occur.

Restoring BIOS Defaults

BIOS and configuration issues may cause suspected hardware errors. If the BIOS settings are wrong, perform the following steps to restore the BIOS to its default setting:

- 1. To access the Setup program, press F2 while the initial HP logo displays immediately after restarting the workstation.
- 2. Press F9 to load the default settings from the Setup program.
- 3. In the main menu, set the Reset Configuration Data to Yes.

Take note of the system setup before you make any modifications to the BIOS.

Clearing the CMOS

To clear the CMOS:

- 1. Turn off the workstation, disconnect the power cord and all cables, then remove the cover.
- 2. Set system board switch 3 to ON (see Figure 2-50 on page 69).
- 3. Replace the cover, and reconnect the power cord and display cable.
- 4. Restart the workstation. A message similar to the following appears:

Configuration has been cleared, set switch Clear to the ON position before rebooting.

- 5. Turn off the workstation, disconnect the power cord and display cables, and remove the cover.
- 6. Set system board switch 3 to OFF.
- 7. Replace the cover, and reconnect the power cord and data cables.
- 8. Turn on the workstation.
- 9. When prompted, press F2 to run Setup. See "Starting the HP Setup Program" on page 74 for more information.
- 10. Press F9. The system automatically downloads and saves the CMOS default values.
- 11. Exit Setup and save the new configuration.

Recovering the BIOS from the Boot Block

If you can't use the standard BIOS flash, the BIOS could be corrupted and unable to boot. You may be able to recover the BIOS from the Boot Block on the system board.

- 1. Obtain a bootable DOS floppy disk.
- 2. Copy the BIOS files onto the floppy disk. For information about how to download the system BIOS, see "Updating the System BIOS" on page 80.
- 3. Create (or edit) the autoexec.bat file, which should contain the following line of text: phlash16 /c /mode=3 /s <BIOS filename>.wph

NOTE

Rename the BIOS filename with the filename on the floppy disk.

- 4. Turn off the workstation, disconnect the power cord, and remove the cover.
- 5. Set switch 2 on the system board to ON (see Figure 2-50 on page 69).
- 6. Insert the floppy disk into the floppy disk drive.
- 7. Reconnect the power cord, and turn on the workstation.
- 8. The workstation boots from the floppy disk, then flashes the BIOS. During the flash process, the screen remains blank. When you hear one long beep, the recovery process is finished.
- 9. Turn off the workstation. Remove the floppy disk from the drive. Remove the power cord.
- 10. Set switch 2 back to OFF.
- 11. Replace the cover, reconnect the power cord, and reboot the workstation.

Hardware Monitoring

Power On Self Test (POST)

The POST can detect errors and changes to the configuration. In either case, a code and short description is displayed.

Read the message and select the appropriate action:

- Press F1 to ignore the message and continue.
- Press F2 to run the Setup program and correct a system configuration error.
- Press **Enter** to see details about the message. After viewing these details, you are returned to the original POST display screen.

See "Understanding Power-on-Self-Test messages" on page 94 for a list of common POST errors and recommended solutions.

E-buzzer

If a problem is detected during pre-boot, the system e-buzzer emits audible beeps and an encoded error message.

See "Troubleshooting with the e-buzzer" on page 96 for a list of e-buzzer errors and recommended solutions.

LEDs

See "Front Control Panel Features" on page 13.

Sensors

The workstation includes the following sensors:

- **Sensor Scan.** Temperatures, fans, processor-related items, and the chassis intrusion switch are scanned by the system.
- **Temperature.** Ambient air and processor temperatures are monitored to control fans. Ambient air controls the rear system fan, while processor temperature(s) control the processor fans.
- **Fan Speed And Control.** Individual fan speed is controlled based on temperature and configuration information. This allows fans to run slower in most circumstances, thus making the machine quieter.
- **Chassis Intrusion.** The chassis intrusion switch activates whenever the system case is opened. During the following system boot, a warning is displayed.

System Configuration and Monitoring Hardware Monitoring

4

Troubleshooting

This chapter contains detailed information to help diagnose and correct problems that may arise as you use your system:

- Identifying and Solving Hardware Problems, page 86
- Understanding Power-on-Self-Test messages, page 94
- Understanding the LED messages, page 93
- Troubleshooting with the e-buzzer, page 96
- Diagnostics Software, page 97
- You Forgot Your Password, page 98

Identifying and Solving Hardware Problems

The following topics describe specific hardware errors that may occur, along with suggested solutions:

- Monitor is Blank or Doesn't Work, page 87
- Keyboard or Mouse Doesn't Work, page 88
- Audio Doesn't Work, page 89
- Optical Drive Problems, page 90
- Hard Disk Drive Problems, page 92

If your workstation does not start properly, make sure the power cord is properly connected and the system is turned on. See the following sections for additional troubleshooting steps:

- Understanding the LED messages, page 93
- Understanding Power-on-Self-Test messages, page 94
- Troubleshooting with the e-buzzer, page 96

NOTE If you still have problems after reviewing the following sections, see the *hp workstation xw8000 Getting Started Guide* for information on running Diagnostic Software.

Monitor is Blank or Doesn't Work

Table 4-1	Video Problems
-----------	----------------

The system's power indicator light works but the monitor remains blank.		
Make sure	How	
The monitor is switched ON (LED is on).	Refer to the monitor manual for an explanation of the LED signals.	
The monitor's power cord is correctly connected.	Ensure the power cord is plugged into a working grounded power outlet and into the monitor.	
The graphics card is installed and the monitor (video) cable is correctly connected.	Ensure the video cable is properly connected to both the system and the monitor. Ensure that the cable is connected to the graphics card's connector.	
The monitor's brightness and contrast settings are correctly set.	Check the settings using the monitor's OSD (on-screen display) or using controls on the front of the monitor.	
The display works properly during the POST bu	t goes blank when the OS starts.	
Make sure How		
The display settings in your OS are compatible	1. Restart your workstation in VGA mode.	
find your graphics card and monitor.	2. After the OS starts, change the display settings to match those supported by your graphics card and monitor.	
	 Refer to your OS and graphics card documentation for information on changing display settings. 	

Keyboard or Mouse Doesn't Work

The keyboard doesn't work.		
Make sure	How	
The keyboard cable is correctly connected.	Ensure that the keyboard is connected to the keyboard connector rather than the mouse connector on the rear panel of the workstation.	
The keyboard is free of debris.	Check all keys are at the same height, and none are stuck down.	
The keyboard itself is not defective.	Either replace the keyboard with a known working unit or try the keyboard with another system.	
The mouse doesn't work.		
Make sure	How	
The mouse cable is correctly connected.	Ensure that the mouse is connected to the mouse connector rather than the keyboard connector on the rear panel of your workstation.	
You are using the correct driver.	Download the latest driver from: www.hp.com/go/bizsupport	
The mouse is clean.	Clean the mouse ball as shown.	
The mouse itself is not defective.	Replace the mouse with unit that is known to work or try the mouse with another system.	

Table 4-2Keyboard and Mouse Problems

Audio Doesn't Work

Table 4-3	Audio Problems
Table 4-5	Auulo I

The system has no sound.			
Check that	How		
Software volume control is not turned down or muted.	See your OS and software documentation for information on setting software volume controls.		
The speaker or optical drive volume control is not turned down.	If your speakers or optical drive have volume control knobs, turn the knob to increase the volume.		
External speakers are plugged into the correct audio jack.	Plug the external speakers into the correct port on the front- or rear-panel of the system. See "Workstation Components" on page 12		
The optical drive audio cable is properly connected.	Connect the audio cable between CD or DVD-ROM drive and the system board. See Figure 2-21 on page 44.		
Headphones or speakers connected to the line out connector are not muting the internal speaker.	Turn on and use headphones or external speakers, if connected, or disconnect headphones or external speakers.		
The workstation is not in Standby mode.	Press the power button to resume from Standby mode.		
Noise or no sound comes out of the speakers or headphones.			
Make sure	How		
The workstation is detecting the correct speaker/headphone type and analog-to-digital auto-sense is engaged.	• If you are using digital speakers that have a stereo jack and want the system to auto-switch to digital, use a stereo-to-mono adapter to properly engage the auto-sense feature.		
	• If a stereo-to-mono adapter is not available, use the multimedia device properties to manually switch the audio signal from analog to digital.		
	• If the headphones have a mono jack, use the multimedia device properties to switch the system to analog out.		

Optical Drive Problems

- Check that a CD (or DVD) is inserted in the drive.
- Ensure all cables (data, power, and audio) have been properly connected both to the drive and to the system board as described on page 45.
- Verify that the drive has been detected in the Setup program Advanced menu by displaying the IDE Devices as described on page 75. You should see a drive declared in the IDE Secondary Master or IDE Secondary Slave field.
- If you intend to boot from the optical drive, place the device before the hard disk drive in the boot order as described on page 78.

Table 4-4

Optical Drive Problems

The workstation does not boot from CD-ROM or DVD drive.			
Make sure	How		
The CD or DVD boot is enabled through the HP Setup utility.	Run the Setup Program and enable booting to removable media and verify boot order settings. See "Boot Menu" on page 78.		
A bootable CD is in the optical drive.	Insert a bootable CD in the drive.		
CD or DVD devices are not detected or driver is	not loaded.		
Make sure	How		
The drive is connected and configured properly.	See "Installing an Optical Drive" on page 45.		
Movie will not play in the DVD drive.			
Make sure	How		
The decoder software is installed properly.	Install decoder software. See the hp workstation xw8000 Getting Started Guide.		
You can't eject a CD.			
Make sure	How		
The disc is properly seated in the drive.	Turn off workstation and insert a thin metal rod into the emergency eject hole and push firmly. Slowly pull the tray out from the drive until the tray is fully extended, then remove the CD.		

Table 4-4Optical Drive Problems (Continued)

The optical drive cannot read a disc or takes too long to start.		
DVD drives take longer to start because they must determine the type of media played, such as audio or video. Wait at least 30 seconds to let the DVD drive determine the type of media being played. If the CD still does not start, read the other solutions listed for this topic.		
Make sure	How	
The disc has been inserted right-side up.	Re-insert the CD with the label facing up.	
The disc is clean and has not been scratched.	Clean CD or DVD with a cleaning kit, available from most computer stores.	
Your OS detects the optical drive.	See the hp workstation xw8000 Getting Started Guide or your OS documentation.	
You can't record to a CD.		
Make sure	How	
You have the correct type of media.	 Verify that you are using the correct media for the drive. Try a different brand of media. Quality varies widely among manufacturers 	
You are recording at the correct speed	Try using a slower speed when recording	
	audio CDs.	
You have the correct software installed.	Install the software from the Applications CD. See the <i>hp workstation xw8000 Getting</i> <i>Started Guide</i> .	

Hard Disk Drive Problems

To correct hard disk drive problems:

- 1. If possible, back up the hard disk drive.
- 2. Ensure the hard disk drive power and data cables are correctly connected as described on page 40.
- 3. Go to the Boot menu of the Setup program and check that booting from the hard drive has not been disabled and has been detected. See "Boot Menu" on page 78.
- 4. Refer to your OS documentation for instructions on running system diagnostic tools like scandisk or defrag.

Understanding the LED messages

Power LED is Flashing or Red

The Power LED located on the Power On/Off button has the following states:

- Solid green: System on.
- **Solid yellow:** Workstation in Stand By or Hibernate mode. See the *hp workstation xw8000 Getting Started Guide* for information on power-saving features supported by your workstation and OS.
- **Flashing yellow or solid red:** System error. Contact HP Customer Care (see page 21).

Hard Disk Drive Activity LED Doesn't Work

If the hard disk drive activity LED does not flicker when the workstation is accessing the hard disk drive, make sure:

- The control panel connector is firmly attached to the system board.
- The hard disk drive power and data cables are correctly connected as described on page 40.

Understanding Power-on-Self-Test messages

The Power-on-Self-Test (POST) can detect both an error and a change to the configuration. In either case, a code and short description is displayed. Depending on the message, one or more choices are displayed:

- Press F1 to ignore the message and continue.
- Press F2 to run the Setup program and correct a system configuration error.
- Press **Enter** to see more details about the message. After viewing these details, you are returned to the original POST display screen.

Common POST errors and recommended solutions:

- **error 0010:** The PC configuration has been lost, cleared, corrupted or has not been initialized. When the PC remains unplugged for a long period of time, the battery that provides the current to keep the CMOS memory powered may become discharged.
 - 1. Check that the battery is properly inserted.
 - 2. If necessary, replace the battery as described in your User's Guide.
 - 3. Run the Setup program to re-configure your PC.
- **error 0011:** When the PC remains unplugged for a long period of time, the battery that provides the current to keep the PC date and time may become discharged.
 - 1. Check that the battery is properly inserted.
 - 2. If necessary, replace the battery as described in your User's Guide.
 - 3. Set time and date from the Setup program or from your operating system.
- error 0012: The PC configuration has been cleared or has not been initialized.
 - Run the Setup program to re-configure your PC.
- **error 0031:** The microcode update for your processor was not found in the system BIOS. The microcode update corrects some errata inside the processor. When it is not loaded, the processor may function incorrectly, potentially causing data loss or corruption. Your BIOS version is probably too old and does not contain the microcode update suitable for your processor.
 - Download and install the latest BIOS from www.hp.com/go/bizsupport
- **error 0100:** A key on the keyboard has been pressed during the PC power-on self-test.
 - 1. Ensure that nothing was put on the keyboard during boot process, and that a key was not accidentally pressed down.
 - 2. If the error persists, your keyboard may need to be replaced. Contact your service representative.

• error 0101: The keyboard has reported an error during its self-test.

1. Restart your PC.

- 2. If the error persists, your keyboard may need to be replaced. Contact your service representative.
- **error 0102:** The system board self-test has detected a general failure on the integrated keyboard controller.
 - Your system board may need to be replaced. Contact your service representative.
- **error 0103:** The keyboard is not connected.
 - 1. Check that the keyboard connector is firmly connected.
 - 2. If the problem persists, your keyboard cable may be damaged or your keyboard may need to be replaced. Contact your service representative.
- error 0105: The mouse has reported an error during its self-test.
 - 1. Clean the mouse and its moving ball as described in "Keyboard or Mouse Doesn't Work" on page 88.
 - 2. If the problem persists, your mouse may need to be replaced. Contact your service representative.
- error 0106: The mouse is not responding.
 - 1. Check that the mouse connector is firmly connected.
 - 2. If the problem persists, your mouse may need to be replaced. Contact your service representative.
- **error 0108:** The system configuration has detected that the mouse and keyboard connections are inverted.

1. Turn of the system.

2. Swap the mouse and keyboard connections.

Troubleshooting with the e-buzzer

When your system starts up, the system firmware performs pre-boot diagnostics to test your hardware configuration for any problems. If a problem is detected during pre-boot, the system e-buzzer will emit audible beeps and an encoded error message.

The e-buzzer emits a different number of beeps for each type of error. The sequence may start with a modem-like sound lasting about three seconds, followed by a number of clear beeps, or the e-buzzer may simple emit clear beeps.

The e-buzzer detects the following errors after a 15-second timeout:

- Memory (3 beeps)
- Graphics card (4 beeps)
- PnP/PCI card (5 beeps)

Table 4-5E-buzzer Beep Codes

Beeps	Component	Error	Solution
0	N/A	No problem or power button stuck.	Dislodge the power button, then allow the system to boot normally.
1	Processor	Processor absent, not correctly connected, or socket not closed.	Contact HP Customer Care. See "Where to Get Help" on page 21.
2	Power Supply	Power supply is in protected mode or system is hung in an undetermined on/off state.	Contact HP Customer Care. See "Where to Get Help" on page 21.
3	Memory	No memory, bad memory modules, or incompatible memory module.	1. Remove any newly installed RAM and reseat it. Ensure that memory is loaded in the correct order.
			2. If the problem persists, contact HP Customer Care or replace the system RAM.
			See "Where to Get Help" on page 21.
4	Video Card	Graphics card problem.	1. Remove the graphics card and reseat it.
			2. If the problem persists, remove the graphics card and replace it with a good card.
5	PCI Card	PnP/PCI card initialization problem.	1. Remove PCI cards until you find the one causing the failure.
			2. Reseat the offending PCI card.
			3. If the problem persists, replace the defective PCI card.
6	BIOS	Corrupted BIOS.	Perform a crisis recovery procedure. See "Recovering the BIOS from the Boot Block" on page 82.
7	System Board	Defective system board.	Contact HP Customer Care. See "Where to Get Help" on page 21.

Diagnostics Software

Your workstation ships with pre-loaded diagnostics software. This software is different for each OS, and may need to be installed from the pre-loaded image on your hard drive. See the *hp workstation xw8000 Getting Started Guide* for more information.

You Forgot Your Password

If you forget the BIOS passwords for the workstation, you must clear them before you can set new passwords.

NOTEThis is not the OS login password. This password is only used to limit access to the
Setup Program menus described in Chapter 3, "System Configuration and Monitoring."
If you forget the OS login password for the workstation, see your OS documentation for
instructions.

Clearing the BIOS User Password

If you forgot your User password and remember the Administrator password, you can clear the User password through the Setup Menu.

To clear the User password:

- 1. Start the Setup Program (see "Starting the HP Setup Program" on page 74).
- 2. Enter the Administrator password when prompted.
- 3. Select Security Menu > Clear all Passwords.
- 4. Enter and confirm a new User password if needed.
- 5. Press **Esc** to leave the Security Menu.
- 6. Select Exit > Exit Saving Changes to save your changes.

Clearing the BIOS Administrator Password

To clear the Administrator password:

- 1. Turn off the workstation and remove the left side panel (page 27).
- 2. Set switch 1 on the system board switch block to On (see Figure 2-50 on page 69).
- 3. Replace the workstation cover.
- 4. Turn on the workstation and press Esc when prompted to see the summary page.
- 5. When a message appears indicating that the passwords have been cleared, turn off the workstation and remove the cover.
- $6. \ Set$ switch 1 on the system board block back to Off.
- 7. Replace the side panel.
- 8. If you want to set new passwords, follow the instructions given in "Security Menu" on page 76.

A

Connector Pin Assignments

This appendix contains the pin assignments for many computer and workstation connectors. Some of these connectors may not be used on the product being serviced.

Connector Pin Assignments

Table A-1Enhanced Keyboard

Сог	nnector and Icon	Pin	Signal	
		1 2	Data Unused	
		$\frac{3}{4}$	Ground +5 VDC	
		5 6	Clock Unused	

Table A-2Mouse

Image: Constraint of the second se	Co	onnector and Icon	Pin	Signal	
			$\begin{array}{c}1\\2\\3\\4\\5\end{array}$	Data Unused Ground +5 VDC Clock	

Table A-3

Ethernet BNC

Connector and Icon	Pin	Signal	
	1 (Center)	Data	
	2 (Shield)	Ground	

Table A-4Ethernet RJ-45

Co	onnector and Icon	Pin	Signal
		1 2 3	 (+) Transmit Data (-) Transmit Data (+) Receive Data
		4 5 6 7	Unused Unused (-) Receive Data Unused
		8	Unused

Table A-5Ethernet AUI

	Connector and Icon								
	\								
Pin	Signal	Pin	Signal						
1	Ground	9	Positive AUI Differential Receive						
2	Negative AUI Differential Collision	10	+12V						
3	Positive AUI Differential Collision	11	Ground						
4	Negative AUI DifferentialTransmit	12	Ground						
5	Positive AUI DifferentialTransmit	13	Unused						
6	Ground	14	Unused						
7	Ground	15	Unused						
8	Negative AUI Differential Receive	16	Unused						

Table A-6Parallel Interface

	Connector and Icon							
(@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@								
Pin	Signal	Pin	Signal	Pin	Signal			
1	Strobe	7	Data Bit 5	13	Select			
2	Data Bit 0	8	Data Bit 6	14	Auto Linefeed			
3	Data Bit 1	9	Data Bit 7	15	Error			
4	Data Bit 2	10	Acknowledge	16	Initialize Printer			
5	Data Bit 3	11	Busy	17	Select IN			
6	Data Bit 4	12	Paper End	18-25	Signal Ground			

Table A-7Serial Interface

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

Table A-8 USB

Connect	tor and Icon	Pin	Signal
		$\begin{array}{c}1\\2\\3\\4\end{array}$	VCC - Data + Data Ground

Table A-9Microphone

Connector and Icon (1/8" miniphone)	Pin	Signal
123	1 (Tip)	Audio
	2 (Ring)	Power
	3 (Shield)	Ground

Table A-10Headphone

Connector and Icon (1/8" miniphone)	Pin	Signal
1 2 2	1 (Tip)	Audio_Left
	2 (Ring)	Audio_Right
	3 (Shield)	Ground

Table A-11Line-In Audio

Connector and Icon (1/8" miniphone)	Pin	Signal
1.2.2	1 (Tip)	Audio_In_Left
	2 (Ring)	Audio_In_Right
	3 (Shield)	Ground

Table A-12Line-Out Audio

Connector and Icon (1/8" miniphone)	Pin	Signal
1.2.3	1 (Tip)	Audio_Out_Left
	2 (Ring)	Audio_Out_Right
	3 (Shield)	Ground

			0	-			
	Connector and Icon						
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1-16	Ground	40	-D0	49-50	Ground	60	-MSG
17-18	TERMPWR	41	-D1	51-52	TERMPW	61	-SEL
19	Reserved	42	-D1	53	Reserved	62	-C/D
20-34	Ground	43	-D3	54	Ground	63	-REQ
35	-D12	44	-D4	55	-ATN	64	-I/O
36	-D13	45	-D5	56	Ground	65	-D
37	-D14	46	-D6	57	-BSY	66	-D
38	-D15	47	-D7	58	-ACK	67	-D
39	-DP1	48	-DP0	59	-RST	68	-D

Table A-13 SCSI Low Voltage Differential/Single Ended (LVD/SE)

Table A-14

Ultra SCSI

	Connector and Icon							
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal	
1-11	Ground	29	DB3	37	Reserved	45	RST #	
12	Reserved	30	DB4	38	TERMPWR	46	MSG #	
13	Open	31	DB5	39	Reserved	47	SEL #	
14	Reserved	32	DB6	40	Ground	48	C/D	
15-25	Ground	33	DB7	41	ATN #	49	REQ #	
26	DB0	34	DBPS	42	Ground	50	Input/Output	
27	DB1	35	Ground	43	BSY #			
28	DB2	36	Ground	44	ACK #			

Table A-15 Externa	al Infrared Transceiver
--------------------	-------------------------

Connector and Icon								
Pin	Signal	Pin	Signal	Pin	Signal			
1	Transmit	4	5V	7	Not Used			
2	Receive	5	Mode	8	Not Used			
3	Ground	6	Not Used					

Table A-16Monitor

Connector and Icon										
		00000								
Pin	Signal	Pin	Signal		Pin	Signal				
1	Red Analog	6	Ground		11	Monitor ID				
2	Green Analog	7	Ground		12	DDC Serial Data				
3	Blue Analog	8	Ground		13	Horizontal Sync				
4	Monitor ID	9	+5V DC		14	Vertical Sync				
5	Ground	10	Ground		15	DDC Serial Clock				

Table A-17 ATA/ATAPI (IDE) Standard Drive Cable

Connector								
		1 						
Pin	Signal	Pin	Signal	Pin	Signal			
1 2 3 4 5 6 7 8 9 10	Reset Ground DD7 DD8 DD6 DD9 DD5 DD10 DD4 DD11	$ \begin{array}{c} 15\\ 16\\ 17\\ 18\\ 19\\ 20\\ 21\\ 22\\ 23\\ 24\\ \end{array} $	DD1 DD14 DD0 DD15 Ground (Key) DMARQ Ground DIOW Ground	29 30 31 32 33 34 35 36 37 38	DMAK Ground INTRQ IOCS16 DA1 PDIAG (cable detect) DA0 DA2 CS1FX CS3FX			
11 12 13 14	DD3 DD12 DD2 DD13	25 26 27 28	DIOR Ground IORDY CSEL	39 40	DASP Ground			

Connector										
1 34 0										
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal			
1	RESDRV_	18	D15	35	A0	52	FP05			
2	GROUND	19	GROUND	36	A2	53	FP06			
3	D07	20	(key)	37	CS1FX	54	FP07			
4	D08	21	DRQ	38	CS3FX	55	FP08			
5	D06	22	GROUND	39	DASP	56	FP09			
6	D09	23	IOW	40	GROUND	57	FP10			
7	D05	24	GROUND	41	+5VMLOG	58	FP11			
8	D10	25	IOR	42	-5VMOT	59	FP12			
9	D04	26	GROUND	43	GROUND	60	FP13			
10	D11	27	IOCHDRY	44	AUDIO_L	61	FP14			
11	D03	28	CABLE SELECT	45	A_GROUND_R	62	FP15			
12	D12	29	DAK	46	A_GROUND_I	63	FP16			
13	D02	30	GROUND	47	audio_r	64	FP17			
14	D13	31	IRQ	48	FP01	65	FP18			
15	D01	32	IO16	49	FP02	66	FP19			
16	D14	33	A1	50	FP03	67	FP20			
17	D00	34	PDIAG	51	FP04	68	FP21			

Table A-18MultiBay CD-ROM Adapter

Connector									
		A ₁ A21	A26	A66					
		B1 B21	B26	B66					
Pin	Signal A	Signal B	Pin	Signal A	Signal B				
1	+12 V	OVRCNT#	34	Vddq	Vddq				
2	TYPEDET#	+ 5V	35	AD22	AD21				
3	Reserved	+ 5V	36	AD20	AD19				
4	USB-	USB+	37	Ground	Ground				
5	Ground	Ground	38	AD18	AD17				
6	INTA#	INTB#	39	AD16	C/BE2#				
7	RST#	CLK	40	Vddq	Vddq				
8	GNT#	REQ#	41	FRAME#	IRDY#				
9	VCC3.3	VCC3.3	42	Reserved	3.3VAux				
10	ST1	ST0	43	Ground	Ground				
11	Reserved	ST2	44	Reserved	Reserved				
12	PIPE#	RBF#	45	VCC 3.3	VCC 3.3				
13	Ground	Ground	46	TRDY#	DEVSEL#				
14	WBF#	Reserved	47	STOP#	Vddq				
15	SBA1	SBA0	48	PME#	PERR#				
16	VCC 3.3	VCC 3.3	49	Ground	Ground				
17	SBA3	SBA2	50	PAR	SERR#				
18	SB_STB#	SB_STB	51	AD15	C/BE1#				
19	Ground	Ground	52	Vddq	Vddq				
20	SBA5	SBA4	53	AD13	AD14				
21	SBA7	SBA6	54	AD11	AD12				
22	Reserved	Reserved	55	Ground	Ground				
23	Ground	Ground	56	AD9	AD10				
24	Reserved	3.3 Vaux	57	C/BE0#	AD8				
25	VCC 3.3	VCC 3.3	58	Vddq	Vddq				
26	AD30	AD31	59	AD STB0#	AD STB0				
27	AD28	AD29	60	$\overline{AD6}$	$AD\overline{7}$				
28	VCC 3.3	VCC 3 3	61	Ground	Ground				
29	AD26	AD27	62	AD4	AD5				
30	AD24	AD25	63	AD2	AD3				
31	Ground	Ground	64	Vddq	Vddq				
32	AD STB1#	AD STB1	65	AD0	AD1				
33	C/BE3#	AD23	66	VREFGC	VREFCG				

Table A-19 Accelerated Graphics Port (AGP)

	Connector									
50 2 50 2 49 1										
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal			
1	RESDRV_	14	GROUND	27	D07	40	D08			
2	D06	15	D09	28	D05	41	D10			
3	D04	16	D11	29	D03	42	D12			
4	D02	17	D13	30	D01	43	D14			
5	D00	18	D15	31	Ground	44	(KEY)			
6	DREQ	19	Ground	32	IOW	45	Ground			
7	IOR	20	Ground	33	OCHRDY	46	CABLE SELECT			
8	DAK	21	Ground	34	IRQ	47	IO16			
9	A1	22	PDIAG	35	A0	48	A2			
10	CS1FX	23	CS3FX	36	DASP	49	Ground			
11	AUDIO_R	24	AUDIO_L	37	A_GND_R	49	A_GND_L			
12	+5VMOT1	25	+5VMOT2	38	+5VMOT3	50	+5VMOT4			
13	+5VMLOG1	26	+5VMLOG2	39	DASP					

Table A-20Slimline IDE CD-ROM Connector for SFF chassis using 810 and 810e
Chipsets

Table A-21	14-Pin Power	(BX Chipset-Based E	Board
------------	--------------	---------------------	--------------

	Connector										
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal				
$\begin{array}{c}1\\2\\3\\4\end{array}$	+3.3 V +3.3 V Sense RTN +5 V	5 6 7 8	RTN +5 V RTN +3.3 V	9 10 11 12	-12 v Fan OFF ON/STBY +5 V Aux	13 14	+3.3 V Sense return +12 V				

Table	; H =22	14-1 III I Ower	(010, 0101	2, 020, and 04	o Chipset-	Daseu Duarus	5)		
			(Connector					
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal		
1	+3.3 V	5	RTN	9	-12 v	13	Fan speed		
2	+3.3 V Aux	6	+5 V	10	Fan OFF	14	+12 V		
3	RTN	7	RTN	11	ON/STBY				

12

+5 V Aux

Table A-2214-Pin Power (810, 810E, 820, and 845 Chipset-Based Boards)

Table A-2320-Pin Power (Deskpro EP)

8

+3.3 V

	Connector								
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal		
1	+3.3 V	6	+5 V	11	+3.3 V	16	RTN		
2	+3.3 V	7	RTN	12	-12 V	17	RTN		
3	RTN	8	Fan OFF	13	RTN	18	-5 V		
4	+5 V	9	+5 V Aux	14	ON/STBY	19	+5 V		
5	RTN	10	+12 V	15	RTN	20	+5 V		

Table A-24

4

 $+5 \mathrm{V}$

20-Pin Power (Deskpro EN)

	Connector									
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal			
1	3 V	6	+5 V	11	+3 V	16	RTN/RS			
2	3 V/RS	7	Aux RTN	12	-12 V	17	RTN			
3	RTN	8	Fan OFF	13	RTN	18	-5 V			
4	+5 V	9	+5 V Aux	14	ON/STBY	19	+5 V			
5	RTN	10	+12 V	15	RTN	20	+5 V			
Table A-2524-Pin Power

Connector										
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal			
1	+3.3 V	7	Aux RTN	13	+3.3 V	19	RTN			
2	+3.3 V	8	Fan OFF	14	$-12 \mathrm{V}$	20	-5 V			
3	RTN	9	+5 V Aux	15	RTN	21	+5 V			
4	+5 V	10	+12 V	16	ON/STBY	22	+5 V			
5	RTN	11	3.3 V Aux	17	RTN	23	3.3 V R/S			
6	+5 V	12	Fan CMD	18	RTN/(R/S)	24	Fan Sink			

Table A-264-Pin Power (for CPU)

Connector and Icon	Pin	Signal	
	1	RTN	
4_3	2	RTN	
4 99	3	12.8 Vcpu	
	4	12.8 Vepu	

Connector Pin Assignments Connector Pin Assignments

Numerics

4-pin power pin assignments, 109 14-pin power pin assignments, 107, 108 20-pin power pin assignments, 108 24-pin power pin assignments, 109

A

accessory card installing, 36 removing, 34 advanced menu, 75 AGP card pin assignments, 106 airflow, 18 ATA/ATAPI (IDE) drive cable pin assignments, 104 audio problems, 89

B

battery installing, 71 removing, 70 BIOS features and specifications, 79 recovering from boot block, 82 restoring, 80 updating, 80 version, 80 boot menu, 78

С

CMOS clearing, 81 components, 12 connector pin assignments, 109 control panel, 13 control panel assembly, 53 installing, 56 removing, 53 cover removing and replacing, 27 removing side cover, 27

D

diagnostics software, 97 dimensions, 12 DIMMs, 31

Е

E-buzzer, 83 beep codes, 96 e-buzzer troubleshooting, 96 EMI warning, 26 environmental specifications, 20 ESD precautions, 26 Ethernet AUI pin assignments, 101 BNC pin assignments, 100 RJ-45 pin assignments, 100

F

fans, 18 floppy drive installing, 47 removing, 46 footprint, 12 4-pin power pin assignments, 109 14-pin power pin assignments, 107, 108 front bezel removing, 28 front panel connectors, 57 front panel I/O assembly removing, 57 front panel I/O assembly installing, 58

G

graphics card installing, 36 removing, 34

Н

hard disk drive problems, 92 hard disk LED, 93 hard drive, 38 installing, 40 removing, 38 headphone pin assignments, 102 heatsink, 59 installing, 65 removing, 59 replacing, 63 HP Customer Care, 21 HP Setup program, 74

I

IDE, 38 IDE CD-ROM pin assignments, Slimline, 107 IDE drive loading order, 41 infrared (IR) transceiver, external, pin assignments, 103 installing accessory card, 36 battery, 71 control panel assembly, 56 fifth SCSI drive, 42 floppy drive, 47 front panel I/O assembly, 58 graphics card, 36 hard drive, 40 memory modules, 32 optical drive, 45 processor, 62 system board, 68 system fan, 52 IR transceiver. See infrared (IR) transceiver

K

keyboard pin assignments, 100 keyboard problems, 88

L

LED messages, 93 line-in audio pin assignments, 102 line-out audio pin assignments, 102

M

main menu, 75 memory modules, 31 installing, 32 removing, 31 menu advanced, 75 boot, 78 main, 75 power, 78 security, 76 microphone pin assignments, 102 monitor pin assignments, 104 monitor problems, 87 motherboard see system board mouse pin assignments, 100 mouse problems, 88 MultiBay CD-RÓM adapter pin assignments, 105

0

optical drive installing, 45 removing, 44 optical drive problems, 90 optical drives, 44

Р

parallel interface pin assignments, 101 password clearing BIOS administrator, 98 clearing user, 98 POST, 83 messages, 94 power consumption, 17 power LED, 93 power menu, 78 power supply, 15 removing, 48 replacing, 50 resetting, 19 processor, 59 installing, 62 removing, 61

R

rear panel, 14 removing accessory card, 34 battery, 70 control panel assembly, 53 covers, 27 floppy drive, 46 front bezel, 28 front panel I/0 assembly, 57 graphics cards, 34 hard drive, 38 heatsink, 59 memory modules, 31 optical drive, 44 power supply, 48 processor, 61 side cover, 27 system board, 66 system fan, 51 replacing covers, 27 front bezel, 29 heatsink, 63 power supply, 50 side cover, 29

\mathbf{S}

SCSI, 38 pin assignments, 103 SCSI drive loading order, 42 SCSI IDs, 43 security menu, 76 sensors, 83 serial interface pin assignments, 101 Setup program, 74 side cover replacing front bezel replacing, 29 speaker problems, 89 specifications BIOS, 79 environmental, 20 system battery, 70 system board, 25 installing, 68 removing, 66 switch settings, 69 system fan installing, 52 removing, 51

Т

troubleshooting audio, 89 CD, 90 DVD, 90 e-buzzer, 96 hard disk, 92 keyboard, 88 monitor, 87 mouse, 88 optical drives, 90 password, 98 20-pin power pin assignments, 108 24-pin power pin assignments, 109

U

Ultra SCSI pin assignments, 103 USB pin assignments, 102

V

video problems, 87 volume problems, 89

W

weight, 12