

HP Workstation xw4200

Service and Technical Reference Guide



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Preface

Important Safety Warnings



WARNING! *Avoid Electrical Shocks.* To avoid electrical shock, do not open the power supplies. There are no user-serviceable parts inside.

To avoid electrical shock and harm to your eyes by laser light, do not open the DVD 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 DVD for power requirements and wavelength. This product is a class I laser product.



WARNING! *Grounding your Equipment.* 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.



WARNING! *Protecting your Ears.* 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.



WARNING! *Removing and Replacing the Cover.* For your safety, never remove the system side cover without first disconnecting the power cord from the power outlet and removing any connection to a telecommunications network. If a Power Protection Device is fitted to your system, you must shut down your computer using its on/off switch, then remove the power cord before removing the system's side cover. Remove the Power Protection Device cables before any servicing operation. Always replace the side cover before switching the system on again.



WARNING! *Battery Safety Information.* 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 system 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 system, 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.



WARNING! Metallic particulates can be especially harmful around electronic equipment. This type of contamination may enter the data center environment from a variety of sources, including, but not limited to, raised floor tiles, worn air conditioning parts, heating ducts, rotor brushes in vacuum cleaners or printer component wear. Because metallic particulates conduct electricity, they have an increased potential for creating short circuits in electronic equipment. This problem is exaggerated by the increasingly dense circuitry of any electronic equipment.

Over time, very fine whiskers of pure metal can form on electroplated zinc, cadmium, or tin surfaces. If these whiskers are disturbed, they may break off and become airborne, possibly causing failures or operational interruptions. For over 50 years, the electronics industry has been aware of the relatively rare, but possible, threat posed by metallic particulate contamination. During recent years, a growing concern has developed in computer rooms where these conductive contaminants are formed on the bottom of some raised floor tiles.

Although this problem is relatively rare, it may be an issue within your computer room. Since metallic contamination can cause permanent or intermittent failures on your electronic equipment, Hewlett-Packard strongly recommends that your site be evaluated for metallic particulate contamination before installation of electronic equipment.



WARNING! *Avoid Burn Injuries.* Some parts inside the computer will be hot. Turn off and unplug the system, then wait approximately three to five minutes for them to cool down before opening the system access panels or touching internal components.



WARNING! 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.



CAUTION *Avoid Static Electricity.* Static electricity can damage electronic components. Turn OFF all equipment and disconnect the power cable before installing an accessory card. Do not let your clothes touch any accessory card. Handle the card as little as possible and with care.



CAUTION *Information on Ergonomic Issues.* It is strongly recommended that you read the ergonomics information in the Safety and Comfort Guide on the Documentation Library CD before using your system. You can access more extensive ergonomics information at: <http://www.hp.com/ergo>.



NOTE *Recycling Your System.* HP has a strong commitment toward the environment. Your HP system has been designed to respect the environment as much as possible. HP can also take back your old system for recycling when it reaches the end of its useful life. HP has a product take-back program in several countries. The collected equipment is sent to an HP recycling facilities in Europe or the U.S.A. As many parts as possible are reused. The remainder is recycled. Special care is taken for batteries and other potential toxic substances, these are reduced into non-harmful components through special chemical processes. If you require more details about the HP product take-back program, contact your local dealer or your nearest HP Sales Office.

Updating BIOS, Drivers, and Software

HP continually strives to implement new enhancements that will increase functionality, performance, and reliability of your HP Workstation. To ensure that your workstation takes advantage of the latest enhancements, HP recommends that you install the latest BIOS, driver, and software updates on a regular basis.

To download available updates from the HP Web site:

- Go to www.hp.com/go/bizsupport.

Or

- Click **Start>Help & Support Center**. Then, click the **HP Software & Drivers Download** icon, select your operating system, and review or select available updates.

Finding Information

E-Support

For online access to technical support information and tools, go to <http://www.hp.com/support>. Support resources include web-based troubleshooting tools, technical knowledge databases, driver and patch downloads, online communities, and proactive notification services.

The following sites are also available to you.

- <http://www.hp.com>—Provides useful product information.
- http://www.hp.com/support/workstation_manuals—Provides the latest online documentation.
- <http://welcome.hp.com/country/us/eng/wwcontact.html>—Provides a listing of the worldwide technical support phone numbers.

Additional Documentation

Refer to the *Documentation Library* CD for additional product information in PDF format. The CD contains the following:

- **Getting Started** (available in print and PDF on library CD)
Helps you set up hardware and factory-provided software; also includes basic troubleshooting information should you encounter any problems during initial startup.
- **Safety and Comfort Guide** (PDF on library CD)
Provides safety and ergonomic information to assist you in setting up a safe and comfortable workstation environment.
- **Safety & Regulatory Information Guide** (PDF on library CD)
Provides safety and regulatory information that ensures compliance with U.S., Canadian, and various international regulations.

Helpful links

The following links can also be accessed for additional information:

- Product Bulletin—The product bulletin contains the QuickSpecs and is available at: <http://h18000.www1.hp.com/products/quickspecs/productbulletin.html>
- For information about the Microsoft® Windows® operating system: <http://www.microsoft.com>
- For information about the Linux operating system: <http://www.redhat.com>

Additional product information is available from the HP Web site at <http://www.hp.com/go/workstations>.

Using the Documentation Library CD

To access the contents of the *Documentation Library* CD follow the steps that are applicable to your workstation.

Windows-Based Workstations

Insert the CD into the CD-ROM drive. The CD Autorun feature begins.

If there is no CD-ROM drive activity for two minutes or more, the Autorun feature might not be enabled on the workstation. To run the CD:

- 1 Click **Start>Run**.
- 2 In the text box, enter:

```
X:\index.htm  
(where X is the drive letter designator for the CD-ROM drive)
```

- 3 Click **OK**.

Linux-Based Workstations

If the workstation is running a Linux operating system, browse the CD and click the index.htm file to launch the CD interface. To view the documents on the CD, download and install Adobe® Acrobat® Reader for Linux from <http://www.adobe.com>.

Locating Regulatory Information

Refer to the *Safety & Regulatory Information* guide on the *Documentation Library* CD for product class information. You can also refer to the label on the rear of the chassis.

Parts and Accessories

For complete and current information on supported accessories and components, visit <http://partsurfer.hp.com>.

Subscriber's Choice

Subscriber's Choice, an HP program, allows you to sign up to receive driver and software alerts, proactive change notifications (PCNs), the HP newsletter, and more. Sign up today at <http://www.hp.com/go/subscriberschoice>.

Chapter 1 Product Overview

This chapter presents an overview of the hardware components of the HP Workstation xw4200. For a more detailed overview of all the hardware components and spare part numbers, visit <http://partsurfer.hp.com>. This chapter includes the following sections:

- “Product Features” on page 14
- “Product Specifications” on page 20
- “ENERGY STAR” on page 24
- “Hyper-Threading Technology” on page 25

Product Features

Exploded View

The following illustration shows an exploded view of the HP Workstation xw4200.



NOTE Drive configurations can vary.

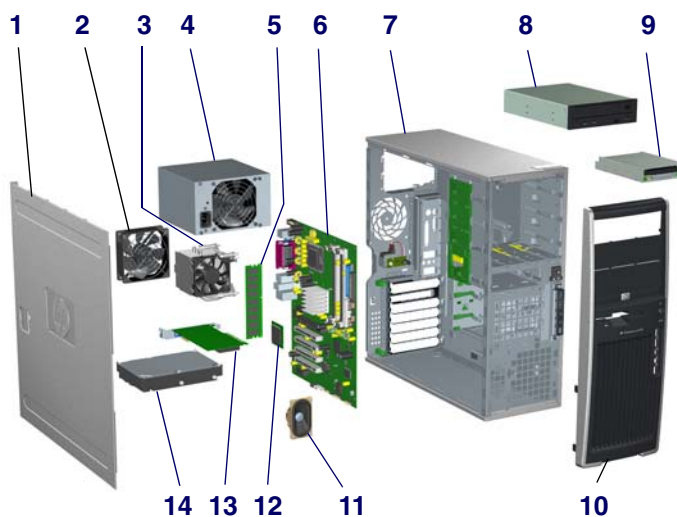


Figure 1-1 Exploded View

1	Access panel	8	Optical drive
2	System fan	9	Diskette drive
3	Processor heatsink	10	Bezel
4	Power supply	11	System speaker
5	Memory	12	Processor
6	System board	13	PCI Express Card
7	Chassis	14	Hard drive

Front Panel Components

The following illustration shows a typical HP Workstation xw4200. Drive configurations might vary depending on the configuration that was purchased.

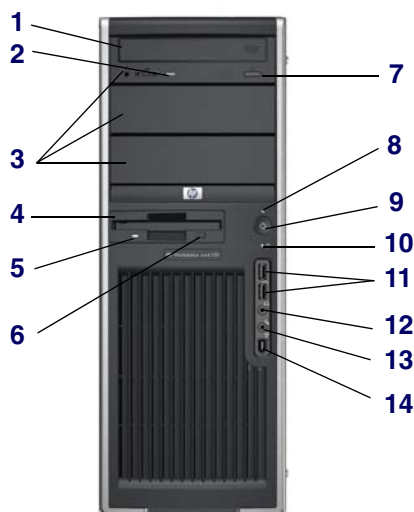


Figure 1-2 Front Panel Components

1	Optical Drive* (optional)	6	Diskette Eject Button	11	Universal Serial Bus (USB) Ports
2	Optical Drive Activity Lights	7	Optical Drive Eject Button	12	Headphone Connector
3	5.25 inch drive bays	8	Power On Light	13	Microphone Connector
4	Diskette Drive (optional)	9	Power Button	14	IEEE-1394 Connector**
5	Diskette Drive Activity Light	10	Hard Drive Activity Light		

*An optical drive is a CD-ROM, CD-R/RW, DVD-ROM, DVD+R/RW, or CD-RW/DVD combo drive.

**IEEE-1394 is an optional feature. If the workstation was purchased without this option, then this connector will be covered.

Rear Panel Components

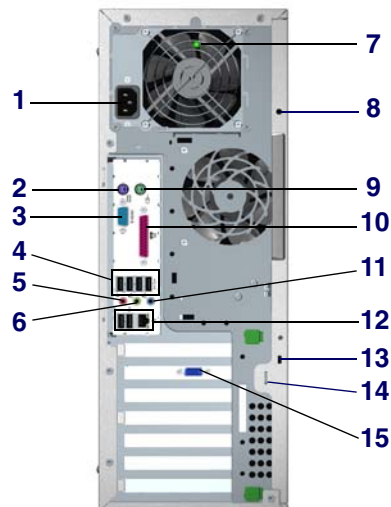


Figure 1-3 Rear Panel Components

1	Power Cord Connector	9	PS/2 Mouse Connector (green)
2	PS/2 Keyboard Connector (purple)	10	Parallel Connector (burgundy)
3	Serial Connector (teal)	11	Audio Line-In Connector (light blue)
4	USB	12	RJ-45 Network Connector and two USB connectors
5	Microphone Connector (pink)	13	Cable Lock Slot
6	Audio Line-Out Connector (lime)	14	Padlock Loop
7	Built In Self Test (BIST) LED (green)	15	Graphics Adapter
8	Universal Chassis Clamp Lock		

NOTE: The rear panel connectors are labeled with industry-standard icons to assist you in connecting your peripheral devices.

System Board Components

The following illustration shows the system board connectors and sockets on the HP Workstation xw4200.

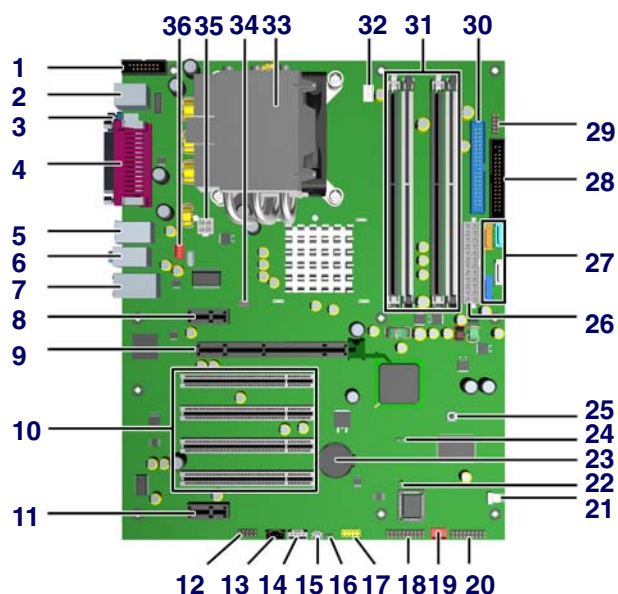


Figure 1-4 System Board Components

1	Second serial port connector (optional)	13	CD-ROM audio	25	Clear CMOS button
2	Keyboard/mouse	14	Auxiliary audio	26	Main power
3	Serial	15	Chassis speaker	27	Serial ATA
4	Parallel	16	Hard disk activity LED	28	Diskette drive
5	USB	17	Front USB	29	MultiBay
6	Audio	18	Trusted Platform Module connector	30	IDE
7	Network/USB	19	Front chassis fan (optional)	31	Memory modules sockets
8	PCI Express x1	20	Front control panel	32	Processor fan
9	PCI Express x16	21	Hood sensor	33	Processor
10	PCI	22	Boot block jumper	34	Solenoid hood lock
11	PCI Express x1	23	Battery	35	Processor power
12	Front audio	24	Password jumper	36	Rear chassis fan

Serial Number and COA Label Location

Each workstation has two unique serial number labels **1** and a certificate of authentication (COA) label **2**. The serial number labels are located on the top (in a minitower configuration) of the unit and on the rear panel. Keep this number available when contacting customer service for assistance. The COA label is located on the top panel (in a minitower configuration).

NOTE The COA label is only if you have a Microsoft XP preinstalled system.



Product Specifications

This section describes the physical, environmental, and graphical and PCI Express specifications for the HP Workstation xw4200. For more specification information, visit <http://www.hp.com> and search for the QuickSpecs for this product.

Physical Specifications

The following table shows the physical characteristics of the HP Workstation xw4200.

Table 1-1 HP Workstation xw4200 Physical Characteristics

Weight	16 kg/35 lb (typical configuration)
Tower Dimensions	45.0 cm (17.7 in) high 16.8 cm (6.6 in) wide 45.6 cm (17.9 in) deep
Maximum Altitude (Non-pressurized)	Operating: 3,000 m (10,000 ft) Non-operating: 9,100 m (30,000 ft)

Environmental Specifications

The following table shows the HP Workstation xw4200 environmental specifications.

Table 1-2 HP Workstation xw4200 Environmental Specifications

Temperature	Operating: 5 to 35°C (40 to 95°F) Non-operating: -40 to 60°C (-40 to 140°F)
Humidity	Operating: 8 to 85%RH, non-condensing Non-operating: 8 to 90%RH, non-condensing
Altitude	Operating: 0 to 10,000 ft (3048m) Non-operating: 0 to 30,000 ft (9144m)
Shock	Operating ½-sine: 40g, 2-3ms Non-operating: ½-sine: 160 cm/s, 2-3ms, (~100g) square: 422 cm/s, 20g
Vibration	Operating Random: 0.5g (rms), 5-300 Hz Non-Operating: random: 2.0 g (rms), 10-500 Hz

Graphics and PCI Express Slot Power Specifications

Your workstation contains four PCI slots, two PCI Express x1 slots, and a single PCI Express x16 high-end graphics slot. The following table describes the slots, card types, and maximum slot power.

Table 1-3 HP Workstation xw4200 Graphics and PCI Express Slot Power Specifications

Slot#	Card Type	Slot Power (Maximum)
1	PCI Express x1 half-length	10 W*
2	PCI Express x16 graphics	75 W*
3-6	PCI	25 W*
7	PCI Express x1 full-length	25 W*

* In addition to these slot power specifications, the overall power consumption of the system (including I/O cards, processor, and memory) must not exceed the maximum ratings of the system power supply.



NOTE For hardware specifications of other system components, such as graphics cards or optical drives, visit the Web site of the specific manufacturer.

Power Supply and Cooling

The following table shows the power supply specifications of the HP Workstation xw4200.

Table 1-4 HP Workstation xw4200 Power Supply Specifications

Full Ranging Input (No Line Select Switch)	Yes
Active Power Factor Correction (APFC) (Input Current is nearly 1/2 a non-APFC PS)	Yes
Passive Power Factor Correction (PFC)	No
Operating Voltage Range	90 to 264 VAC/118 VAC
Rated Voltage Range	100 to 240 VAC
Rated Line Frequency	50 to 60 Hz/400 Hz
Operating Line Frequency Range	47 to 66 Hz/393 to 407 Hz
Rated Input Current	6.4A/6.4A
Maximum Rated Power	410 W
Heat Dissipation	Typical 737.1 btu/hr Maximum 2152.8 (410W)
Power Supply Fan	92mm variable speed
Power Supply Dimensions	9.76 cm (3.843 in) wide 15 cm (5.906 in) high 15.371 cm (6.052 in) deep
ENERGY STAR Compliant	Yes
FEMP Standby Power Compliant (<2W in S5–Power Off)	No
Power Consumption in ES Mode–Suspend to RAM (S3) (Instantly Available PC)	2.5 W
Built-in Self Test LED	Yes
Surge Tolerant Full Ranging Power Supply	Withstands power surges up to 2000 V

Power Consumption and Cooling

The following table shows the power consumption for a typical configuration based on primary power consumptions:

- One processor (1 x 3.4 GHz Pentium 4 Processor with HT Technology)
- One GB memory (2 x 512 MB)
- Two hard drives (2 x SATA 40 GB)
- CD-ROM drive
- PCI-Express Graphics Card (Quadro FX 1300)
- One diskette
- Monitor

Table 1-5 HP Workstation xw4200 Power Consumption and Cooling

Input Power Consumption	120 VAC/60Hz
Typical operating mode (system busy)	216 W/737.1 btu/hr
Windows XP Idle	138 W/470.9 btu/hr
Standby mode (S3)	2.5 W/8.53 btu/hr
Hibernate mode (S4)	2.1 W/7.166 btu/hr
Power Off (S5)	7.166 btu/hr



NOTE When you turn off your workstation with the power button on the front panel, the power consumption falls below 10 W. To reach zero power consumption, either unplug the workstation from the power outlet or use a power strip with a switch. However, removing all power to the workstation might reduce the life of the real-time clock battery.

For more information on power-saving features, refer to your operating system documentation.

System Fans and Airflow

The workstation includes a rear system fan, one processor heatsink fan, plus an optional front system fan.

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.

ENERGY STAR

The ENERGY STAR® program, a government-backed initiative, promotes energy efficiency by identifying ways to reduce energy consumption. Select HP workstations participate in the ENERGY STAR program.



NOTE ENERGY STAR is not supported on Linux-based workstations.

For those workstations that support ENERGY STAR and have it enabled, the power management features will be set as follows:

- Monitor—goes into Sleep mode after 20 minutes of inactivity.
- System—goes into Standby mode after 20 minutes of inactivity.
- Hard Drive—goes into Power Savings mode after the system goes into Standby mode.



NOTE If you must restore the operating system, reset the ENERGY STAR settings (if applicable).

To verify the factory default power settings for your product:

- From the Windows 2000 or Windows XP Classic Start menu, select **Start>Settings>Control Panel>Power Options**.
- From the Windows XP standard Start menu, select **Start>Control Panel>Performance and Maintenance>Power Options**.

ENERGY STAR Compliance

HP products purchased with the ENERGY STAR configuration are compliant with the U.S. Environmental Protection Agency (EPA) ENERGY STAR Computers Program. The EPA ENERGY STAR configuration does not imply endorsement by the EPA. As an ENERGY STAR Partner, HP has determined that products with the ENERGY STAR configuration meet the ENERGY STAR guidelines for energy efficiency.

The ENERGY STAR Computers Program was created by the EPA to promote energy efficiency and reduce air pollution through more energy-efficient equipment in homes, offices, and factories. HP products achieve this by reducing the power consumption when not being used.

ENERGY STAR on HP Workstations uses ACPI power management. The system can wake as a result of a user action (keyboard or mouse) or from the network or a modem.

The Power Management feature, when used in conjunction with an external ENERGY STAR-compliant monitor, will support the power-down features of the monitor. The Power Management feature allows an external monitor to go into low-power mode when the energy save timeout occurs.



CAUTION Using the Energy Save Monitor feature with non-ENERGY STAR compliant monitors might cause video distortion when the Energy Save timeout occurs.

Hyper-Threading Technology

Hyper-Threading Technology is a high-performance technology, developed by Intel®, that enables a single processor to execute multiple threads of instructions simultaneously. Hyper-Threading Technology enables the processor to utilize its execution resources more efficiently, delivering performance increases and improving user productivity. Not all systems benefit from the Hyper-Threading Technology.

To see if Hyper-Threading Technology can benefit you, test your system by turning the feature on. Computer Setup (F10) can be used to turn this feature on. To do this, run F10 Setup during boot up and select **Advanced>Device Options>Hyper-Threading**, and enable the Hyper-Threading Technology.



NOTE If your workstation does not support Hyper-Threading Technology, the Hyper-Threading menu item will not be available on the Computer Setup menu.



NOTE The Hyper-Threading Technology is recommended for use with Windows XP systems. This technology is detected by the system and is turned on in the operating system after it is enabled in the system BIOS.



NOTE Red Hat Enterprise Linux WS 3 supports Hyper-Threading Technology. An SMP-capable kernel must be installed on your system before this technology can be utilized.

For more information about the Hyper-Threading Technology, visit the Intel Web site at <http://www.intel.com>.

Chapter 2 Installing or Restoring the Operating System

This chapter discusses installation and restoration of the operating system. This chapter includes the following sections:

- “Installing the Operating System and Software” on page 28
- “Restoring the Operating System” on page 31
- “Protecting the Software” on page 31
- “Ordering Backup Software” on page 32

If the workstation was shipped with a preinstalled OS, it is configured automatically the first time the workstation is turned on.



CAUTION Do not add optional hardware devices to your workstation until the operating system is successfully installed. Doing so can cause errors and might prevent the operating system from installing properly.



CAUTION When the automatic installation has begun, **DO NOT TURN OFF THE WORKSTATION UNTIL THE PROCESS IS COMPLETE.** Turning off the workstation during the installation process might damage the software that runs the workstation.

Installing the Operating System and Software

The following section discusses the operating system and HP software installation procedures.

Microsoft Windows XP Professional

The first time you turn on your workstation, you will be prompted to select a language for the operating system. After selecting the language, read and follow the on-screen instructions to complete the installation of the operating system. This takes approximately 10 minutes, depending on the system hardware configuration. During the process, do not turn off your workstation unless you are directed to do so.

Installing or Upgrading Device Drivers

To install hardware devices, such as a printer, a display adapter, or network adapter after the operating system installation is completed, make sure that the operating system has access to the appropriate software drivers for the devices. Device drivers are usually provided on a CD supplied with the peripheral device.

Some existing peripheral devices might not have been shipped with drivers developed for Windows XP. To locate the most current device drivers, visit <http://www.hp.com>.

Creating a Restore Diskette

To create a restore diskette for Windows XP, go to **Start>All Programs>Accessories>System Tools>System Restore**, and follow the on-screen instructions.

Linux-Preinstalled Workstations

If you have a Linux-preinstalled workstation, follow the instructions in this section to set up your OS and software.

After the boot process completes, you can view additional HP Linux documentation by simply opening your Internet browser (the browser is automatically set to use the local HP documentation page as its default). You can also access Linux Web links for Red Hat (Internet access required) by using your Internet browser.



NOTE For additional information concerning the setup of Linux-preinstalled or Linux-enabled workstations, refer to the *HP User Manual for Linux*, located at http://www.hp.com/support/linux_user_manual.

For more information about HP and Linux, visit <http://www.hp.com/linux>.

Starting Up the Linux Operating System

The first time the workstation is booted, the Red Hat First Boot utility displays. This program enables you to enter your password, network, graphics, time, and keyboard settings for your workstation.



CAUTION When the automatic installation has begun, DO NOT TURN OFF THE WORKSTATION UNTIL THE PROCESS IS COMPLETE. Turning off the workstation during the installation process might damage the software that runs the workstation or prevent its proper installation.



NOTE When you enable the YPBind feature in the Network tab of the Linux Setup Tool, you might get a blank screen for about 15–30 seconds after you have selected and saved all of your settings and have exited the utility. This is normal. The boot process continues its execution after the screen returns.

Restoring the Linux Operating System



NOTE To restore the Linux OS, the HP Driver CD and Red Hat box set are required.

Download the latest HP Driver CD to get any new enhancements.



NOTE Linux does not support mixed hard disk drive types for manufacturing preload. When restoring the operating system, mixed hard disk drive types can be handled with the restoring media.

DOWNLOADING THE LATEST HP DRIVER CD

To download the latest HP Driver CD:

- 1 Download the ISO image to a local hard drive from the HP support Web site for the appropriate workstation platform (such as <http://www.hp.com/support/xw4200>).
 - a Click the download drivers and software link.
 - b Select the Linux OS that matches your box set.
 - c Select the latest version from the Utility Tools section.
 - d Download and unpack it (`tar zxvf filename.tgz`).
- 2 Copy the ISO image to CD-R bootable media. On another Linux workstation, use the `cdrecord` utility. Identify the device address for the CD burner (`cdrecord --scanbus`). The default is usually 2, 0, 0.

Example:

```
cdrecord -v -eject dev=2,0,0 CD0_golden.iso
```

INSTALLING WITH THE HP DRIVER CD

To install with the HP Driver CD:

- 1 Boot the workstation from the Red Hat box set Binary CD 1.
- 2 Insert the Linux operating system CDs from the Red Hat box set as prompted.
- 3 Continue following the prompts until the operating system is successfully installed.
- 4 Configure the X server to start on reboot.
- 5 Reboot the workstation.
- 6 Follow the prompts to set up your system with the Red Hat First Boot utility.
- 7 When prompted in First Boot to add additional CDs, insert the HP Driver CD into the CD-ROM tray of the workstation.

- 8 Click **Install** next to “Additional CDs.”
The HP Driver CD window opens.
- 9 Click **Press to begin install...**
- 10 When the install is done, you will have two options, “Reboot now...” on the left side and “Press to continue, reboot later...” on the right side. Click **Reboot now...**

Upgrading Device Drivers

If you must upgrade a Linux device driver, visit the HP Web site at <http://www.hp.com/go/workstationsupport>.

Linux-Enabled Workstations

Linux-enabled workstations are not pre-installed with Linux. They require the HP Installer Kit for Linux and the purchase of a Red Hat box set. The Installer kit includes the HP CDs necessary to complete the installation of all versions of the Red Hat box set which have been verified to work on HP workstation hardware.

Verifying Hardware Compatibility

To see which Linux versions have been verified to work on HP workstation hardware:

- 1 Go to http://www.hp.com/support/workstation_manuals.
- 2 Select your HP workstation model.
- 3 Click the **Hardware Support Matrix for Linux** link.

Installing the Linux Operating System

To install the Linux operating system on your Linux-enabled system:

- 1 Follow the instructions for “[Restoring the Linux Operating System](#)” in the previous section.
- 2 Follow the instructions for “[Starting Up the Linux Operating System](#)” in the previous section.



NOTE For more information concerning the setup of Linux-preinstalled or Linux-enabled workstations, refer to the *HP User Manual for Linux*, located at http://www.hp.com/support/linux_user_manual.

For more information about HP and Linux, visit <http://www.hp.com/linux>.

Upgrading Device Drivers

If you must upgrade a Linux device driver, visit the HP Web site at <http://www.hp.com/go/workstationsupport>.

HP Software

The following HP software will also be installed the first time the workstation is turned on:

- Computer Setup (F10) Utilities and diagnostic features
- HP Support Software including device drivers
- HP Client Manager Software (available for download from <http://www.hp.com/go/EasyDeploy>)
- System Software Manager (available for download from <http://www.hp.com/go/ssm>)
- Power Management Setup with energy saver features (not supported for Linux)
- Security Management tools
- Software Support Management tools

Certain drivers and utilities are available only in selected languages. You can obtain the latest version of these files, in English and selected other languages, in one of the following ways:

- Support Software CD
- HP Web site at <http://www.hp.com>
- *Restore Plus!* CD, which is supplied with Windows-based workstations
- *HP Workstations Driver for Red Hat Enterprise Linux 3* CD, which is supplied with Linux-based workstations



NOTE Additional HP software might be required in certain situations.

Restoring the Operating System

Restore the original Microsoft Windows XP Professional operating and factory-installed software by using the *Restore Plus!* CD and the OS CD that came with the workstation. Carefully read and follow the instructions provided with the *Restore Plus!* CD.

For more information about restoring the Linux OS or software, see “[Restoring the Linux Operating System](#)” on page 29.

Protecting the Software

To protect software from loss or damage, you should keep a backup copy of all system software, applications, and related files stored on the hard drive. Refer to the operating system or backup utility documentation for instructions on making backup copies of data files.

Ordering Backup Software

All software that shipped with the workstation, including the *Restore Plus!* CD, can be ordered from HP as a single set, or you can order the various software packages separately.



NOTE Before calling HP to order the software, be sure to have the serial number of the workstation available. This number is necessary for all diskette orders. See the [“Serial Number and COA Label Location” on page 19](#) for the location of the serial number on the workstation.

Chapter 3 System Management

This chapter discusses the various tools and utilities that allow for the system management of the HP Workstation xw4200. This chapter includes the following sections:

- “Computer Setup (F10)” on page 34
- “Desktop Management” on page 44

Computer Setup (F10)

The Computer Setup (F10) utilities enable you to perform the following tasks:

- Change factory default settings and to set or change the system configuration, which might be necessary when you add or remove hardware.
- Determine if all of the devices installed on the workstation are recognized by the system and functioning properly.
- Determine information about the operating environment of the workstation.
- Solve system configuration errors detected but not automatically fixed during the Power-On Self-Test (POST).
- Establish and manage passwords and other security features.
- Establish and manage energy-saving timeouts (not supported for Linux platforms).
- Modify or restore factory default settings.
- Set the system date and time.
- Set, view, change, or verify the system configuration including settings for processor, graphics, memory, audio, storage, communications, and input devices.
- Modify the boot order of bootable devices, such as hard drives, diskette drives, optical drives, or LS-120 drives.
- Configure the boot priority of SATA, IDE (ATA) and SCSI hard drive controllers.
- Enable Quick Boot which is faster than Full Boot, but does not run all of the diagnostic tests run during a Full Boot. You can set your system to:
 - always Quick Boot (default)
 - periodically Full Boot (from every 1–30 days)
 - always Full Boot
- Enable or disable Network Server Mode, which allows the workstation to boot the operating system when the power-on password is enabled with or without a keyboard or mouse attached. When attached to the system, the keyboard and mouse remain locked until the power-on password is entered.
- Select POST Messages Enabled or Disabled to change the display status of POST messages. POST Messages Disabled suppresses most POST messages, such as memory count, product name, and other non-error text messages. If a POST error occurs, the error is displayed regardless of the mode selected. To manually switch to POST Messages Enabled during POST, press any key (except **F1** through **F12**).
- Establish an Ownership Tag, the text of which is displayed each time the system is turned on or restarted.
- Enter the Asset Tag or property identification number assigned by your company to this workstation.
- Enable power-on password prompting during system restarts (warm boots) as well as during power-on.
- Secure the integrated I/O functionality, including the serial, USB, or parallel ports, audio, or embedded NIC, so that they cannot be used until they are unsecured.
- Enable or disable Master Boot Record (MBR) Security.

- Enable or disable removable media boot ability.
- Enable or disable removable media write ability (when supported by hardware).
- Replicate your system setup by saving system configuration information on diskette and restoring it on one or more workstations.
- Execute self-tests on a specified SATA or IDE (ATA) hard drive (when supported by the drive).



NOTE All features identified in this chapter might not be available on all HP products.

BIOS ROM

The Basic Input/Output System (BIOS) of the workstation is a collection of machine language programs stored as firmware in read-only memory (ROM). The BIOS ROM includes such functions as POST, PCI device initialization, Plug 'n Play support, power management activities, and the Setup utility. The firmware contained in the BIOS ROM supports the following systems and specifications:

- Microsoft WHQL
- Alert-On-LAN (AOL) and Wake-On-LAN (WOL)
- ACPI 1.0 and OnNow
- SMBIOS 2.3.5
- PC98/99/00 and NetPC
- PXE boot ROM for the integrated LAN controller
- BIOS Boot Specification 1.01
- Enhanced Disk Drive Specification 3.0
- “El Torito” Bootable CD-ROM Format Specification 1.0
- ATAPI Removable Media Device BIOS Specification 1.0
- MPS Specification 1.4 (for booting Linux SMP)

The BIOS ROM is a 512-KB Firmware Hub (or Firmware Hub-compatible) part. The runtime portion of the BIOS resides in a 128-K block from E0000h to FFFFFh.

Using Computer Setup (F10)

Computer Setup can be accessed only by turning on the workstation or restarting the system. To access the Computer Setup Utilities menu:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart the Computer**.
- 2 Wait for the `F10=Setup` prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must try again. Turn the workstation off, then on again, and press the **F10** key again to access the utility.

- 3 Select your language from the list and press **Enter**. A choice of four headings appears in the Computer Setup Utilities menu: File, Storage, Security, and Advanced.
- 4 Use the arrow (left and right) keys to select the appropriate heading. Use the arrow (up and down) keys to select the option you want, then press **Enter**.
- 5 To apply and save changes, select **File>Save Changes and Exit**.
 - If you have made changes that you do not want applied, select **Ignore Changes and Exit**.
 - To reset to factory settings, select **Set Defaults and Exit**. This option will restore the original factory system defaults.



CAUTION Do NOT turn the workstation power OFF while the ROM is saving your Computer Setup F10 changes because the CMOS could become corrupted. It is safe to turn off all power to the workstation after you exit the F10 Setup screen.



NOTE This menu can change with new firmware releases, so it might be consistent with what is presented in the following table.

Table 3-1 Computer Setup Menu

Heading	Option	Description	
File	System Information	Lists product name, processor type/speed/stepping, cache size (L1/L2), system ROM family and version, installed memory size, chassis serial number, integrated MAC for enabled or embedded NIC (if applicable), and asset tracking number.	
	About	Displays copyright information.	
	Set Time and Date	Allows you to set system time and date.	
	Replicated Setup	Save to Removable Media	Saves system configuration, including CMOS, to a formatted blank 1.44-MB diskette in file CPQsetup.txt.
		Restore to Removable Media	Restores system configuration from a diskette.
	Default Setup	Save Current Settings as Default	Saves the current settings as default settings for the next operation.
		Restore Factory Settings as Default	Restores the factory settings as the default settings for the next operation.
	Apply Defaults and Exit	Restores factory default settings which includes clearing any established passwords.	
	Ignore Changes and Exit	Exits Computer Setup without applying or saving any changes.	
	Save Changes and Exit	Saves changes to system configuration and exits Computer Setup.	

Table 3-1 Computer Setup Menu (Continued)

Heading	Option	Description															
Storage	Device Configuration	<p>Lists all installed non-SCSI storage devices. SCSI storage drives will not be listed in Computer Setup (F10). When a device is selected, detailed information and options are displayed. The following options might be presented:</p> <hr/> <p>Diskette Type <i>(for legacy diskette drives only)</i> Identifies the highest capacity media type accepted by the diskette drive. Options are 3.5" 1.44 MB, 5.25" 1.2 MB, and Not Installed.</p> <hr/> <p>Drive Emulation <i>(IDE devices only)</i> Allows you to select a drive emulation type for a storage device. (For example, a Zip drive can be made bootable by selecting disk emulation.)</p> <hr/> <table border="1"> <thead> <tr> <th>Drive Type</th> <th>Emulation Options</th> </tr> </thead> <tbody> <tr> <td rowspan="3">ATAPI Zip drive</td> <td>None (treated as Other).</td> </tr> <tr> <td>Diskette (treated as diskette drive).</td> </tr> <tr> <td>Disk (treated as hard drive).</td> </tr> <tr> <td rowspan="2">IDE Hard disk</td> <td>None (treated as Other).</td> </tr> <tr> <td>Disk (treated as hard drive).</td> </tr> <tr> <td>Legacy diskette</td> <td>No emulation options available.</td> </tr> <tr> <td>IDE CD-ROM</td> <td>No emulation options available.</td> </tr> <tr> <td>ATAPI LS-120</td> <td>No emulation options available.</td> </tr> </tbody> </table> <hr/> <p>Transfer Mode <i>(IDE devices only)</i> Specifies the active data transfer mode. Options (subject to device capabilities) are PIO 0, Max PIO, Enhanced DMA, Ultra DMA 0, and Max UDMA.</p> <hr/> <p>Translation Mode <i>(IDE disks only)</i> Lets you select the translation mode to be used for the device. This enables the BIOS to access disks partitioned and formatted on other systems and may be necessary for users of older versions of UNIX (for example, SCO UNIX version 3.2). Options are Bit-Shift, LBA Assisted, User, and None.</p> <p>CAUTION: A new Automatic option has been added to allow for BIOS to automatically determine the translation mode used to configure a previously formatted IDE, SATA, or USB mass storage device. This prevents you from having to know how the mass storage device was previously formatted.</p> <p>Ordinarily, the translation mode selected automatically by the BIOS should not be changed. If the selected translation mode is not compatible with the translation mode that was active when the disk was partitioned and formatted, the data on the disk will be inaccessible.</p> <hr/> <p>Translation Parameters <i>(IDE disks only)</i> Allows you to specify the parameters (logical cylinders, heads, and sectors per track) used by the BIOS to translate disk I/O requests (from the operating system or an application) into terms the hard drive can accept. Logical cylinders cannot exceed 1024. The number of heads cannot exceed 256. The number of sectors per track cannot exceed 63. These fields are only visible and changeable when the drive translation mode is set to User.</p> <hr/> <p>Multisector Transfers <i>(IDE disks only)</i> Specifies how many sectors are transferred per multi-sector PIO operation. Options (subject to device capabilities) are Disabled, 8, and 16.</p>	Drive Type	Emulation Options	ATAPI Zip drive	None (treated as Other).	Diskette (treated as diskette drive).	Disk (treated as hard drive).	IDE Hard disk	None (treated as Other).	Disk (treated as hard drive).	Legacy diskette	No emulation options available.	IDE CD-ROM	No emulation options available.	ATAPI LS-120	No emulation options available.
Drive Type	Emulation Options																
ATAPI Zip drive	None (treated as Other).																
	Diskette (treated as diskette drive).																
	Disk (treated as hard drive).																
IDE Hard disk	None (treated as Other).																
	Disk (treated as hard drive).																
Legacy diskette	No emulation options available.																
IDE CD-ROM	No emulation options available.																
ATAPI LS-120	No emulation options available.																

Table 3-1 Computer Setup Menu (Continued)

Heading	Option	Description
Storage (continued)	Options	<p>Removable Media Boot Enables/disables ability to boot the system from removable media.</p> <hr/> <p>Legacy Diskette Write Enables/disables ability to write data to removable media. NOTE: This feature applies only to legacy diskette, (IDE/ATA) LS-120 Superdisk, (IDE/ATA) LS-240 Superdisk, and (IDE/ATA) PD-optical drives. NOTE: After saving changes to Removable Media Boot, the workstation will restart. Manually, turn the workstation off, then on.</p> <hr/> <p>BIOS DMA Data Transfers Allows you to enable or disable the BIOS use of DMA for IDE data transfers.</p> <hr/> <p>IDE Controller Allows you to enable or disable the primary IDE/ATA controller.</p> <hr/> <p>SATA Emulation Enables the SATA to emulate the RAID controller, combined controllers, or a separate controller.</p> <hr/> <p>SATA Primary Controller Allows you to disable the SATA primary controller ports.</p> <hr/> <p>SATA Secondary Controller Allows you to disable the SATA secondary controller ports.</p> <hr/> <p>Diskette MBR Validation Allows you to enable or disable strict validation of the diskette MBR. NOTE: If you use a bootable diskette image that you know to be valid, and it does not boot with Diskette MBR Validation enabled, you might need to disable this option to use the diskette.</p>
		<p>IDE DPS Self-Test</p> <p>Allows you to execute self-tests on IDE hard drives capable of performing the Drive Protection System (DPS) self-tests. NOTE: This selection will only appear when at least one drive capable of performing the IDE DPS self-tests is attached to the system.</p>
		<p>Controller Order*</p> <p>Allows you to specify the order of the attached hard drive controllers. The first hard drive controller in the order will have priority in the boot sequence and will be recognized as drive C (if any devices are attached). NOTE: The selection will not appear if all hard drives are attached to the embedded IDE controllers.</p>
		<p>Boot Order</p> <p>Allows you to configure the boot, diskette drive, and hard drive orders by physically reordering the menu entries. Each device on the list can be individually excluded from or included for consideration as a bootable operating system source. NOTE: MS-DOS drive lettering assignments might not apply after a non-MS-DOS operating system has started.</p> <p>Shortcut to Temporarily Override Boot Order To boot one time from a device other than the default device specified in Boot Order, restart the workstation and press F9 when the F10=Setup message appears on the screen. After POST is completed, a list of bootable devices is displayed. Use the arrow keys to select the preferred bootable device and press Enter. The workstation then boots from the selected non-default device for this one time.</p>

*Available on select models.

Table 3-1 Computer Setup Menu (Continued)

Heading	Option	Description
Security	Setup Password	Allows you to set and enables setup (administrator) password. NOTE: If the setup password is set, it is required to change Computer Setup options, flash the ROM, and make changes to certain Plug 'n Play settings under Windows.
	Power-On Password	Allows you to set and enable power-on password.
	Device Security*	Enables/disables serial ports A and B, parallel port, front USB ports, all USB ports, system audio, network controllers (some models), and SCSI controllers (some models).
	Network Service Boot	Enables/disables the workstation's ability to boot from an operating system installed on a network server. (Feature available on NIC models only; the network controller must reside on the PCI bus or be embedded on the system board.)
	Password Options (This selection will appear only if a power-on password is set.)	Allows you to specify whether the password is required for warm boot (CTRL+ALT+DEL).
	Hood sensor*	Allows you to enable/disable solenoid hood (Smart Cover) lock. NOTE: <i>Notify User</i> alerts the user that the sensor has detected that the cover has been removed. <i>Setup Password</i> requires that the setup password be entered to boot the workstation if the sensor detects that the cover has been removed. This feature is supported on select models only.
	DriveLock*	Allows you to assign or modify a master or user password for certain hard drives. When enabled, the user is prompted to provide one of the DriveLock passwords during POST. If neither is successfully entered, the hard drive will remain inaccessible until one of the passwords is successfully provided during a subsequent cold-boot sequence. This selection will only appear when at least one drive that supports the DriveLock feature is attached to the system.
	Master Boot Record Security*	Allows you to enable or disable MBR Security. When enabled, the BIOS rejects all requests to write to the MBR on the current bootable disk. Each time the workstation is powered on or rebooted, the BIOS compares the MBR of the bootable disk to the previously saved MBR. If changes are detected, you are given the option of saving the MBR on the current bootable disk, restoring the previously saved MBR, or disabling MBR security. You must know the setup password if one is set. NOTE: Disable MBR Security before intentionally changing the formatting or partitioning of the current bootable disk. Several disk utilities (such as FDISK and FORMAT) attempt to update the MBR. If MBR Security is enabled and disk accesses are being serviced by the BIOS, write requests to the MBR are rejected, causing the utilities to report errors. If MBR Security is enabled and disk accesses are being serviced by the operating system, any MBR change will be detected by the BIOS during the next reboot, and an MBR Security warning message will be displayed.
	Save Master Boot Record*	Saves a backup copy of the Master Boot Record of the current bootable disk. NOTE: Only appears if MBR Security is enabled.
System IDs	Allows you to set: - Asset tag (18-byte identifier) and ownership Tag (80-byte identifier displayed during POST). - Chassis serial number or Universal Unique Identifier (UUID) number. The UUID can only be updated if the current chassis serial number is invalid. (These ID numbers are normally set in the factory and are used to uniquely identify the system.) - Keyboard locale setting (for example, English or German) for System ID entry.	

*Available on select models

Table 3-1 Computer Setup Menu (Continued)

Heading	Option	Description
Security (continued)	Restore Master Boot Record*	Restores the backup Master Boot Record to the current bootable disk. NOTE: Only appears if all of the following conditions are true: - MBR Security is enabled. - A backup copy of the MBR has been previously saved. - The current bootable disk is the same disk from which the backup copy of the MBR was saved. NOTE: Restoring a previously saved MBR after a disk utility or operating system has modified the MBR might cause the data on the disk to become inaccessible. Only restore a previously saved MBR if you are confident that the current bootable disk's MBR has been corrupted or infected with a virus.
	Smarter	Allows you to use Smarter authentication for the Pre-Boot process.
	Embedded Security Device	Embedded Security Device Allows you to activate the Trusted Platform Module. Setup password must be established before this menu item can be selected. Reset to Factory Settings Allows you to clear all encryption keys stored into the Trusted Platform Module. Setup password must be established before this menu item can be selected.
	Device Security	SMBUS Controller was added to embedded devices capable of being hidden or available during a refresh of the BIOS.
Power	OS Power Management	Allows you to enable PCI Express ASPM support.
	Thermal	Allows you set the fan idle mode.
*Available on select models.		

Table 3-1 Computer Setup Menu (Continued)

Heading	Option	Description
Advanced**	Power-On Options	<p>Allows you to set:</p> <ul style="list-style-type: none"> - POST mode (QuickBoot, FullBoot, or FullBoot every 1–30 days). - POST messages (enable/disable). - Safe POST* (enable/disable). Enabling this feature allows the ROM to monitor add-in cards during boot. If an add-in card does not work or initialize correctly, then on the next boot all cards will be skipped during POST. - F9 prompt (enable/disable). Enabling this feature will display the text F9=Boot Menu during POST. Disabling this feature prevents the text from being displayed but pressing F9 will still access the Shortcut Boot (Order) Menu screen. Refer to Storage>Boot Order for more information. - F10 prompt (enable/disable). Enabling this feature will display the text F10=Setup during POST. Disabling this feature prevents the text from being displayed but pressing F10 will still access the Setup screen. - F12 prompt (enable/disable). Enabling this feature will display the text F12=Network Service Boot during POST. Disabling this feature prevents the text from being displayed but pressing F12 will still force the system to attempt booting from the network. - Option ROM* prompt (enable/disable). Enabling this feature will cause the system to display a message before loading options ROMs. - Remote wakeup boot source (remote server/local hard drive). - Fan Idle Mode: Allows you set the fan idle mode. - After Power Loss (off/on/previous state): After power loss, if you connect your workstation to an electric power strip and would like to turn on power to the workstation using the switch on the power strip, set this option to ON. The previous state will set the power loss setting to whatever the unit status was before the power loss. - If you turn off power to your workstation using the switch on a power strip, you will not be able to use the suspend/sleep feature or the Remote Management features. - POST Delay (in seconds) (enable/disable). Enabling this feature will add a user-specified delay to the POST process. This delay is sometimes needed for hard disks on some PCI cards that spin up very slowly; so slowly that they are not ready to boot by the time POST is finished. The POST delay also gives you more time to select F10 to enter Computer Setup (F10). - I/O APIC Mode (enable/disable). Enabling this feature will allow Microsoft Windows Operating system to run optimally. This feature must be disabled for certain non-Microsoft Operating Systems to work properly. - ACPI/USB Buffers @ Top of Memory (enable/disable). Enabling this feature places USB memory buffers at the top of memory. The advantage of remapping is that it allows space in the DOS Compatibility Hole range, below 1-MB, to be made available for additional PCI plug-in cards that need option ROM space.
	BIOS Power-On	Allows you to select week days and a specific time to automatically power the unit on from the power-off state.
	Onboard Devices	Allows you to set resources for or disable onboard system devices (serial port, parallel port, or diskette controller).
	PCI Devices	Lists currently installed PCI devices and their IRQ settings. Allows you to reconfigure IRQ settings for these devices or to disable them entirely. These settings have no effect under an APIC-based operating system.
	Bus Options*	<p>Allows you to enable or disable:</p> <ul style="list-style-type: none"> - PCI bus mastering, which allows a PCI device to take control of the PCI bus. - PCI VGA palette snooping, which sets the VGA palette snooping bit in PCI configuration space; only needed when more than one graphics controller is installed. - PCI SERR# generation. - ECC support allows hardware-based error correction for ECC-capable memories.

*Available on select models.

**These options should be used by advanced users only.

Table 3-1 Computer Setup Menu (Continued)

Heading	Option	Description
Advanced** (continued)	Device options	<p>Allows you to set:</p> <ul style="list-style-type: none"> - Printer mode (bi-directional, EPP+ECP, output only). - Num Lock state at power-on (off/on). - Power management event (PME) wakeup events (enable/disable). - Processor cache (enable/disable). - Hyper-Threading* (enable/disable). - ACPI S3* support (enable/disable). S3 is an advanced configuration and power interface (ACPI) sleep state that some add-in hardware options might not support. - ACPI S3 selections are supported on select models only. If the ACPI S3 support option is not presented, the other ACPI S3 options (ACPI S3 Video REPOST, ACPI S3 Hard disk Reset, and ACPI S3 PS2 Mouse Wakeup) will not be available. - ACPI S3 Video REPOST* (enable/disable). This feature reruns the video option ROM on a boot from the S3 state. - ACPI S3 Hard Disk Reset* (enable/disable). Resets the hard disk on a boot from the S3 sleep state. - ACPI S3 PS2 Mouse Wakeup* (enable/disable). Allows the mouse to wake the system from the S3 sleep state. - Aperture size*. Allows you to specify the amount of system memory reserved for use by your graphics controller. - Monitor Tracking (enable/disable). Allows ROM to save monitor asset information. - Unique Sleep State Blink Patterns*. Allows you to choose a LED blink pattern that uniquely identifies each sleep state. - Frame Buffer Size*. Allows you to specify amount of system memory dedicated to the embedded graphics frame buffer. The AUTO setting attempts to optimize the frame buffer size depending on the amount of total system memory. - PCI Slot x Option ROM Download. Allows you to enable/disable the downloading of the PCI slot option ROM. "X." can be a value of 1, 2, 3, 4, or 5. - NIC PXE (enable/disable). The BIOS contains an embedded NIC option ROM to allow the unit to boot through the network to a PXE server. This is typically used to download a corporate image to a hard drive. The NIC option ROM takes up memory space below 1-MB commonly referred to as DOS Compatibility Hole (DCH) space. This space is limited. The F10 option allows you to disable the downloading of the embedded NIC option ROM, giving more DCH space for other PCI cards which might need option ROM space. The default setting for the NIC option ROM is "enabled."
	PCI VGA Configuration	Displayed only if there are multiple PCI video adapters in the system. Allows you to specify which VGA controller will be the "boot" or primary VGA controller.

*Available on select models.

**These options should be used by advanced users only.

Desktop Management

HP Client Management Solutions (available for download from <http://www.hp.com/go/workstationsupport>) provides standards-based solutions for managing and controlling workstations in a networked environment. This section summarizes the capabilities and features of the key components of desktop management:

- Initial Configuration and Deployment
- Remote System Installation
- Software Updating and Management
- ROM Flash
- Asset Tracking and Security
- Fault Notification and Recovery



NOTE Support for specific features described in this guide might vary by model or software version.

Initial Configuration and Deployment

The workstation comes with a preinstalled system software image. After a brief software “unbundling” process, the workstation is ready to use.

You may prefer to replace the preinstalled software image with a customized set of system and application software. There are several methods for deploying a customized software image. They include:

- Installing additional software applications after unbundling the preinstalled software image.
- Using software deployment tools, such as Altiris Deployment Solutions™, to replace the preinstalled software with a customized software image.
- Using a disk cloning process to copy the contents from one hard drive to another.

The best deployment method depends on your information technology environment and processes. The PC Deployment section of the HP Lifecycle Solutions Web site (<http://whp-sp-orig.extweb.hp.com/country/us/en/solutions.html>) provides information to help you select the best deployment method.

The Restore Plus! CD, ROM-based setup, and ACPI hardware provide further assistance with recovery of system software, configuration management and troubleshooting, and power management.

Remote System Installation

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

- Deploying a software image on one or more new PCs
- Formatting a hard drive
- Installing application software or drivers
- Updating the operating system, application software, or drivers

To initiate Remote System Installation, press **F12** when the `F12=Network Service Boot` message appears in the lower-right corner of the HP logo screen. Follow the on-screen instructions to continue the process. The default boot order is a BIOS configuration setting that can be changed to always attempt to PXE boot.

HP and Altiris have partnered to provide tools designed to make the task of corporate PC deployment and management easier and less time-consuming, ultimately lowering the total cost of ownership and making HP PCs the most manageable client PCs in the enterprise environment.

Software Updating and Management

HP provides several tools for managing and updating software on desktops and workstations—HP Client Manager Software, Altiris Client Management Solutions, System Software Manager; Proactive Change Notification; and Subscriber's Choice.

HP Client Manager Software

HP Client Manager Software (HP CMS) assists HP customers in managing the hardware aspects of their client workstations with features that include:

- Detailed views of hardware inventory for asset management
- PC health check monitoring and diagnostics
- Proactive notification of changes in the hardware environment
- Web-accessible reporting of business critical details such as machines with thermal warnings, memory alerts, and more
- Remote updating of system software such as device drivers and ROM BIOS
- Remote changing of boot order
- Configuring the system BIOS settings

For more information on the HP Client Manager, visit <http://www.hp.com/go/im>.

Altiris Client Management Solutions

HP and Altiris have partnered to provide comprehensive, tightly integrated systems management solutions to reduce the cost of owning HP client PCs. HP Client Manager Software is the foundation for additional Altiris Client Management Solutions that address:

- Inventory and Asset Management
 - SW license compliance
 - PC tracking and reporting
 - Lease contract, fixing asset tracking
- Deployment and Migration
 - Microsoft Windows XP Professional or Home Edition migration
 - System deployment
 - Personality migrations

- Help Desk and Problem Resolution
 - Managing help desk tickets
 - Remote troubleshooting
 - Remote problem resolution
 - Client disaster recovery
- Software and Operations Management
 - Ongoing desktop management
 - HP system SW deployment
 - Application self-healing

For more information and details on how to download a fully-functional 30-day evaluation version of the Altiris solutions, visit <http://h18000.www1.hp.com/im/prodinfo.html#deploy>.

System Software Manager

System Software Manager (SSM) is a utility that lets you update system-level software on multiple systems simultaneously. When executed on a PC client system, SSM detects both hardware and software versions, then updates the appropriate software from a central repository, also known as a file store. Driver versions that are supported by SSM are denoted with a special icon on the software, the driver download Web site, and on the Support Software CD. To download the utility or to obtain more information on SSM, visit <http://www.hp.com/go/ssm>.

Proactive Change Notification

The Proactive Change Notification program uses the Subscriber's Choice Web site in order to proactively and automatically:

- Send you Proactive Change Notification (PCN) e-mails informing you of hardware and software changes to most commercial workstations and servers, up to 60 days in advance.
- Send you e-mail containing Customer Bulletins, Customer Advisories, Customer Notes, Security Bulletins, and Driver alerts for most commercial workstations and servers.

You create your own profile to ensure that you only receive the information relevant to a specific IT environment. To learn more about the Proactive Change Notification program and create a custom profile, visit <http://www.hp.com/go/pcn>.

Subscriber's Choice

Subscriber's Choice is a client-based service from HP. Based on your profile, HP will supply you with personalized product tips, feature articles, and/or driver and support alerts/notifications. Subscriber's Choice Driver and Support Alerts/Notifications will deliver e-mails notifying you that the information you subscribed to in your profile is available for review and retrieval. To learn more about Subscriber's Choice and create a custom profile, visit <http://www.hp.com/go/pcn>.

ROM Flash

The workstation comes with a programmable flash ROM (read only memory). By establishing a setup password in the Computer Setup (F10) Utility, you can protect the ROM from being unintentionally updated or overwritten. This is important to ensure the operating integrity of the workstation. Should you need or want to upgrade the ROM, you may:

- Order an upgraded ROMPaq diskette from HP.
- Download the latest ROMPaq images from HP driver and support page, <http://www.hp.com/support/files>.



CAUTION For maximum ROM protection, be sure to establish a setup password. The setup password prevents unauthorized ROM upgrades. System Software Manager allows the system administrator to set the setup password on one or more PCs simultaneously. For more information, visit <http://www.hp.com/go/ssm>.

Remote ROM Flash

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

The workstation must be powered on, or turned on through Remote Wakeup, to take advantage of Remote ROM Flash.

For more information on Remote ROM Flash, refer to the HP Client Manager Software or System Software Manager at <http://h18000.www1.hp.com/im/prodinfo.html>.

HPQFlash

The HPQFlash utility is used to locally update or restore the system ROM on individual PCs through a Windows operating system.

For more information on HPQFlash, visit <http://www.hp.com/support/files> and enter the name of the workstation when prompted.

FailSafe Boot Block ROM

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

- If the system ROM is valid, the system starts normally.
- If the system ROM fails the validation check, the FailSafe Boot Block ROM provides enough support to start the system from a ROMPaq diskette, which will program the system ROM with a valid image.



NOTE Some models also support recovery from a ROMPaq CD. ISO ROMPaq images are included with selected models in the downloadable ROM softpaqs.

When the boot block detects an invalid system ROM, the System Power LED blinks RED 8 times, one every second, followed by a 2-second pause. Also, eight simultaneous beeps will be heard. A Boot Block recovery mode message is displayed on the screen (some models).

To recover the system after it enters Boot Block recovery mode:

- 1 If there is a diskette in the diskette drive or a CD in the CD drive, remove the diskette and CD and turn off the power.
- 2 Insert a ROMPaq diskette into the diskette drive or, if permitted on this workstation, a ROMPaq CD into the CD drive.
- 3 Turn on the workstation.

If no ROMPaq diskette or ROMPaq CD is found, you will be prompted to insert one and restart the workstation.

If a setup password has been established, the Caps Lock light will turn on and you will be prompted to enter the password.

- 4 Enter the setup password.

If the system successfully starts from the diskette and successfully reprograms the ROM, then the three keyboard lights will turn on. A rising tone series of beeps also signals successful completion.

- 5 Remove the diskette or CD and turn the power off.
- 6 Turn the power on again to restart the workstation.

The following table lists the various keyboard light combinations used by the Boot Block ROM (when a PS/2 keyboard is attached to the workstation), and explains the meaning and action associated with each combination.

Table 3-2 Keyboard Light Combinations Used by Boot Block ROM

FailSafe Boot Block Mode	Keyboard LED Activity	State/Message
Num Lock	On	ROMPaq diskette or ROMPaq CD not present, is bad, or drive not ready.
Caps Lock	On	Enter password.
Num, Caps, Scroll Lock	Blink On in sequence, one at a time—N,C, SL	Keyboard locked in network mode.
Num, Caps, Scroll Lock	On	Boot Block ROM Flash successful. Turn power off, then on to reboot.

NOTE: Diagnostic lights do not flash on USB keyboards

Replicating the Setup

The following procedures give an administrator the ability to easily copy one setup configuration to other workstations of the same model. This allows for faster, more consistent configuration of multiple workstations.



NOTE Both procedures require a diskette drive.



NOTE To collect and replicate BIOS settings on multiple computers, use System Software Manager or HP Client Manager Software. For more information, visit <http://www.hp.com/go/easydeploy>.

COPYING TO SINGLE WORKSTATION



CAUTION A setup configuration is model-specific. File system corruption may result if source and target workstations are not the same model. For example, do not copy the setup configuration from an HP Workstation xw8200 to an HP Workstation xw4200.

- 1 Select a setup configuration to copy. Turn off the workstation. If you are in Windows, click **Start>Shut Down>Shut Down**.
- 2 Turn on the workstation.
- 3 Wait for the **F10=Setup** prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 4 If you are using a diskette, insert it now.
- 5 Select **File>Replicated Setup>Save to Removable Media**. Follow the instructions on the screen to create the configuration diskette.
- 6 Turn off the workstation to be configured and insert the configuration diskette. This procedure gives an administrator the ability to easily copy one setup configuration to other workstations of the same model. This allows for faster, more consistent configuration of multiple workstations.
- 7 Turn on the workstation to be configured.
- 8 Wait for the **F10=Setup** prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.
- 9 Select **File>Replicated Setup>Restore from Removable Media**, and follow the instructions on the screen.
- 10 Restart the workstation when the configuration is complete.

COPYING TO MULTIPLE WORKSTATIONS



CAUTION A setup configuration is model-specific. File system corruption may result if source and target workstations are not the same model. For example, do not copy the setup configuration from a xw6200 to a xw4200.

This method takes a little longer to prepare the configuration diskette, but copying the configuration to target workstations is significantly faster.



NOTE A bootable diskette is required for this procedure. If Windows XP is not available to use to create a bootable diskette, use the method for copying to a single workstation instead (see “[Copying to Single Workstation](#)” on page 49).

- 1 Create a bootable diskette.
 - 2 Select a setup configuration to copy. Turn off the workstation. If you are in Windows, click **Start>Shut Down>Shut Down**.
 - 3 Turn on the workstation.
 - 4 Wait for the **F10=Setup** prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.
-



NOTE If you do not press the **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 5 If you are using a a diskette, insert it now.
- 6 Select **File>Replicated Setup>Save to Removable Media**. Follow the instructions on the screen to create the configuration diskette.
- 7 Download a BIOS utility for replicating setup (repset.exe) and copy it onto the configuration diskette. To obtain this utility, go to <http://welcome.hp.com/support/files> and enter the model number of the workstation.
- 8 On the configuration diskette, create an autoexec.bat file containing the following command:
repset.exe.
- 9 Turn off the workstation to be configured. Insert the configuration diskette and turn the workstation on. The configuration utility will run automatically.
- 10 Restart the workstation when the configuration is complete.

Dual-State Power Button

With Advanced Configuration and Power Interface (ACPI) enabled, the power button can function either as an on/off switch or as a standby button. The stand-by feature does not completely turn off power, but instead causes the workstation to enter a low-power standby state. This allows you to power down quickly without closing applications and to return quickly to the same operational state without any data loss.

To change the power button's configuration:

- 1 Click the **Start** button, then select **Control Panel>Power Options**.
- 2 In the **Power Options Properties**, select the **Advanced** tab.
- 3 In the **Power Button** section, select **Stand by**.

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



CAUTION Do not use the power button to turn off the workstation unless the system is not responding; turning off the power without operating system interaction could cause damage to or loss of data on the hard drive.

World Wide Web Site

HP engineers rigorously test and debug software developed by HP and third-party suppliers, and develop operating system specific support software, to ensure performance, compatibility, and reliability for HP workstations.

When making the transition to new or revised operating systems, it is important to implement the support software designed for that operating system. If you plan to run a version of Microsoft Windows that is different from the version included with the workstation, you must install corresponding device drivers and utilities to ensure that all features are supported and functioning properly.

HP has made the task of locating, accessing, evaluating, and installing the latest support software easier. You can download the software from <http://www.hp.com/support>.

The Web site contains the latest device drivers, utilities, and flashable ROM images needed to run the latest Microsoft Windows operating system on the HP workstation.

Building Blocks and Partners

HP management solutions integrate with other systems management applications, and are based on industry standards, such as:

- Web-Based Enterprise Management (WBEM)
- Windows Management Interface (WMI)
- Wake on LAN Technology
- ACPI
- SMBIOS
- Pre-boot Execution (PXE) support

Asset Tracking and Security

Asset tracking features incorporated into the workstation provide key asset tracking data that can be managed using HP Systems Insight Manager, HP Client Manager Software or other system management applications. Seamless, automatic integration between asset tracking features and these products enables you to choose the management tool that is best suited to the environment and to leverage the investment in existing tools.

HP also offers several solutions for controlling access to valuable components and information. ProtectTools Embedded Security, if installed, prevents unauthorized access to data and checks system integrity and authenticates third-party users attempting system access. Security features such as ProtectTools, the Smart Cover Sensor and the Smart Cover Lock, available on select models, help to prevent unauthorized access to the internal components of the workstation. By disabling parallel, serial, or USB ports, or by disabling removable media boot capability, you can protect valuable data assets. Memory Change and Smart Cover Sensor alerts can be automatically forwarded to system management applications to deliver proactive notification of tampering with a workstation's internal components.



NOTE ProtectTools, the Smart Cover Sensor, and the Smart Cover Lock are available as options on select systems.

Use the following utilities to manage security settings on the HP workstation:

- Locally, using the Computer Setup Utilities.
- Remotely, using HP Client Manager Software or System Software Manager. This software enables the secure, consistent deployment and control of security settings from a simple command-line utility.

The following table and sections refer to managing security features of the workstation locally through the Computer Setup (F10) Utilities.

Table 3-3 Security Features Overview

Feature	Purpose	How it is Established
Removable Media Boot Control	Prevents booting from the removable media drives.	From the Setup Utilities menu.
Serial, Parallel, USB, or Infrared Interface Control	Prevents transfer of data through the integrated serial, parallel, USB, or infrared interface.	From the Setup Utilities menu.
Power-On Password	Prevents use of the workstation until the password is entered. This can apply to both initial system startup and restarts.	From the Setup Utilities menu.
Setup Password	Prevents reconfiguration of the workstation (use of the Setup Utilities) until the password is entered.	From the Setup Utilities menu.
Network Server Mode	Provides unique security features for workstations being used as servers.	From the Setup Utilities menu.
DriveLock	Prevents unauthorized access to the data on specific hard drives.	From the Setup Utilities menu.

Table 3-3 Security Features Overview

Feature	Purpose	How it is Established
Master Boot Record Security	Can prevent unintentional or malicious changes to the MBR of the current bootable disk and provides a means of recovering the “last known good” MBR.	From the Setup Utilities menu.
Ownership Tag	Displays ownership information, as defined by the system administrator, during system startup (protected by setup password).	From the Setup Utilities menu.
Cable Lock Provision	Prevents entire system theft only. 3mm x 7mm slot at rear of system.	Install a cable lock to secure the workstation to a fixed object, lock the access panel and secure internal components.
Padlock loop	Prevents access panel from being removed. This loop can also be used to secure the unit to a fixed object.	Install a padlock.
Solenoid Hood (Smart Cover) Lock (Optional)	Prevents removal of the access panel and all internal components including optical and diskette drives. Eliminates the need for a physical key by enabling password-protected locking & unlocking by a local or remote user. This feature is sold with the Hood Sensor.	Install a solenoid lock.
Hood Sensor (Optional)	Notifies a local or remote user when the chassis access panel has been opened. This feature is sold with the Solenoid Hood (Smart Cover) Lock.	Install an intrusion sensor.
Universal Chassis Clamp Lock (Optional)	The version without a cable discourages access panel removal and prevents theft of IO devices. The version with a cable additionally prevents entire system theft and allows multiple systems to be secured with a single cable.	Install a chassis clamp lock.
Rear Port Controller Cover	Clips to the back of the workstation and secures your input-output devices and prevents any cables at the back of the workstation from being removed.	Install a rear port controller cover.

NOTE: For more information about Computer Setup, see “Using Computer Setup (F10)” on page 36.

Password Security

The power-on password prevents unauthorized use of the workstation by requiring entry of a password to access applications or data each time the workstation is turned on or restarted. The setup password specifically prevents unauthorized access to Computer Setup, and can also be used as an override to the power-on password. That is, when prompted for the power-on password, entering the setup password instead will allow access to the workstation.

A network-wide setup password can be established to enable the system administrator to log in to all network systems to perform maintenance without having to know the power-on password.



NOTE System Software Manager and HP Client Manager Software allow remote management of Setup Passwords and other BIOS settings in a networked environment. For more information, visit <http://www.hp.com/go/EasyDeploy>.

ESTABLISHING A SETUP PASSWORD USING COMPUTER SETUP

Establishing a setup password through Computer Setup prevents reconfiguration of the workstation (use of the Computer Setup (F10) utility) until the password is entered.

To establish a setup password using workstation setup:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart**.
- 2 Wait for the **F10=Setup** prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 3 Select **Security>Setup Password** and follow the on-screen instructions.
- 4 Before exiting, select **File>Save Changes and Exit**.

ESTABLISHING A POWER-ON PASSWORD USING WORKSTATION SETUP

Establishing a power-on password through Computer Setup prevents access to the workstation when power is turned on, unless the password is entered. When a power-on password is set, Computer Setup presents Password Options under the Security menu. The password options include Network Server Mode and Password Prompt on Warm Boot.

When Network Server Mode is disabled, the password must be entered each time the workstation is turned on when the key icon appears on the monitor. When Password Prompt on Warm Boot is enabled, the password must also be entered each time the workstation is rebooted. When Network Server Mode is enabled, the password prompt is not presented during POST, but any attached PS/2 keyboard will remain locked until the user enters the power-on password.

To establish a power-on password through workstation setup:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart**.
- 2 Wait for the `F10=Setup` prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 3 Select **Security>Power-On Password** and follow the on-screen instructions.
- 4 Before exiting, select **File>Save Changes and Exit**.

ENTERING A POWER-ON PASSWORD

To enter a power-on password:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart the Computer**.
- 2 When the key icon appears on the monitor, enter the current password, then press **Enter**.



NOTE Type carefully. For security reasons, the characters you enter do not appear on the screen.

If you enter the password incorrectly, a broken key icon appears. Try again. After three unsuccessful tries, you must turn off the workstation, then turn it on again before you can continue.

ENTERING A SETUP PASSWORD

If a setup password has been established on the workstation, you will be prompted to enter it each time you run Computer Setup.

To enter a setup password:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart the Computer**.
- 2 Wait for the `F10=Setup` prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 3 When the key icon appears on the monitor, enter the setup password, then press **Enter**.



NOTE Type carefully. For security reasons, the characters you enter do not appear on the screen.

If you enter the password incorrectly, a broken key icon appears. Try again. After three unsuccessful tries, you must turn off the workstation, then turn it on again before you can continue.

CHANGING A POWER-ON OR SETUP PASSWORD

To change a power-on or setup password:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart the Computer**. To change the setup password, run Computer Setup.
- 2 To change the Power-On password, go to step 3.

To change the Setup password, wait for the `F10=Setup` prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 3 When the key icon appears, type the current password, a slash (/) or alternate delimiter character, your new password, another slash (/) or alternate delimiter character, and your new password again as shown:

```
current password/new password/new password
```



NOTE Type carefully. For security reasons, the characters you enter do not appear on the screen.

- 4 Press **Enter**.

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



NOTE See the “[National Keyboard Delimiter Characters](#)” on page 58 for information about the alternate delimiter characters. The power-on password and setup password can also be changed using the Security options in Computer Setup.

Deleting a Power-On or Setup Password

To delete a power-on or setup password:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart the Computer**.
- 2 To delete the Power-On password, go to Step 3.

To delete the Setup Password, wait for the `F10=Setup` prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the computer and try again to access the utility.

- 3 When the key icon appears, enter your current password followed by a slash (/) or alternate delimiter character as shown:

```
current password/
```

- 4 Press **Enter**.



NOTE See the “[National Keyboard Delimiter Characters](#)” on page 58 section for information about the alternate delimiter characters. The power-on password and setup password can also be changed using the Security options in Computer Setup.

NATIONAL KEYBOARD DELIMITER CHARACTERS

Each keyboard is designed to meet country-specific requirements. The syntax and keys that you use for changing or deleting your password depend on the keyboard that came with your workstation.

Table 3-4 National Keyboard Delimiter Characters

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

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

CLEARING PASSWORDS

If you forget your password, you cannot access the workstation. See Appendix H, [“Additional Password Security and Resetting CMOS”](#) for instructions on clearing passwords.

DriveLock

DriveLock prevents unauthorized access to the data on MultiBay hard drives. DriveLock has been implemented as an extension to Computer Setup. It is only available when DriveLock-capable hard drives are detected.

DriveLock employs a two-password security scheme. One password is intended to be set and used by a system administrator while the other is typically set and used by the end-user. There is no “back-door” that can be used to unlock the drive if both passwords are lost. Therefore, DriveLock is most safely used when the data contained on the hard drive is replicated on a corporate information system or is regularly backed-up.

CAUTION If both DriveLock passwords are lost, the hard drive is rendered unusable.



USING DRIVELOCK

The DriveLock option appears under the Security menu in Computer Setup. The user is presented with options to set the master password or to enable DriveLock. A user password must be provided to enable DriveLock. Since the initial configuration of DriveLock is typically performed by a system administrator, a master password should be set first. HP encourages system administrators to set a master password whether they plan to enable DriveLock or keep it disabled. This will give the administrator the ability to modify DriveLock settings if the drive is locked in the future. Once the master password is set, the system administrator can enable DriveLock or choose to keep it disabled.

If a locked hard drive is present, POST will require a password to unlock the device. If a power-on password is set and it matches the user password of the device, POST will not prompt the user to re-enter the password. Otherwise, the user will be prompted to enter a DriveLock password. Either the master or the user password can be used. Users will have two attempts to enter a correct password. If neither attempt succeeds, POST will continue but the data on the drive will remain inaccessible.

DRIVELOCK APPLICATIONS

The most practical use of the DriveLock security feature is in a corporate environment where a system administrator provides users with MultiBay hard drives for use in some desktop workstations. The system administrator would be responsible for configuring the MultiBay hard drive which would involve, among other things, setting the DriveLock master password. In the event that the user forgets the user password or the equipment is passed on to another employee, the master password can always be used to reset the user password and regain access to the hard drive.

HP recommends that corporate system administrators who choose to enable DriveLock also establish a corporate policy for setting and maintaining master passwords. This should be done to prevent a situation where an employee intentionally or unintentionally sets both DriveLock passwords before leaving the company. In such a scenario, the hard drive would be rendered unusable and require replacement. Likewise, by not setting a master password, system administrators might find themselves locked out of a hard drive and unable to perform routine checks for unauthorized software, other asset control functions and support.

For users with less stringent security requirements, HP does not recommend enabling DriveLock. Users in this category include personal users or users who do not maintain sensitive data on their hard drives as a common practice. For these users, the potential loss of a hard drive resulting from forgetting both passwords is much greater than the value of the data DriveLock has been designed to protect. Access to Computer Setup and DriveLock can be restricted through the Setup password. By specifying a Setup password and not giving it to end users, system administrators are able to restrict users from enabling DriveLock.

Hood Sensor

The hood sensor is an optional feature that is a combination of hardware and software technology that can alert you when the workstation access panel has been removed. This option is available as a kit that includes the solenoid hood (Smart Cover) lock (see the following section). There are three levels of protection, as described in the following table.

Table 3-5 Hood Sensor Protection Levels

Level	Setting	Description
Level 0	Disabled	Hood sensor is disabled (default).
Level 1	Notify User	When the workstation is restarted, the screen displays a message indicating that the workstation access panel has been removed.
Level 2	Setup Password	When the workstation is restarted, the screen displays a message indicating that the workstation access panel has been removed. You must enter the setup password to continue.

NOTE: These settings can be changed using Computer Setup.

SETTING THE HOOD SENSOR PROTECTION LEVEL

To set the hood sensor protection level:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart**.
- 2 Wait for the **F10=Setup** prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the computer and try again to access the utility.

- 3 Select **Security>Smart Cover>Cover Removal Sensor**, then access panel, and follow the on-screen instructions.
- 4 Before exiting, select **File>Save Changes and Exit**.

Solenoid Hood (Smart Cover) Lock

The solenoid hood lock is available as an option on HP Workstation xw4200 models (this option comes as a kit that includes the hood sensor). When installed, the solenoid hood lock can prevent unauthorized access to the internal components.



CAUTION For maximum cover lock security, be sure to establish a setup password. The setup password prevents unauthorized access to the Computer Setup utility.

LOCKING THE SOLENOID HOOD LOCK

To activate and lock the solenoid hood lock:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart**.
- 2 Wait for the **F10=Setup** prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 3 Select **Security>Smart Cover>Cover Lock>Lock** option.
- 4 Before exiting, select **File>Save Changes and Exit**.

UNLOCKING THE SOLENOID HOOD LOCK

To unlock the solenoid hood lock:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart**.
- 2 Wait for the **F10=Setup** prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 3 Select **Security>Smart Cover>Cover Lock>Unlock**.
- 4 Before exiting, select **File>Save Changes and Exit**.

USING THE ACCESS PANEL FAILSAFE KEY

If you enable the solenoid hood lock and cannot enter your password to disable the lock, you will need a access panel FailSafe Key to open the workstation access panel. You will need the key in any of the following circumstances:

- Power outage
- Startup failure
- PC component failure (such as processor or power supply)
- Forgotten password



CAUTION The access panel FailSafe Key is a specialized tool available from HP. Be prepared; order this key before you need one.

To obtain the FailSafe Key, complete any one of the following tasks:

- Contact your authorized HP reseller or service provider.
- Visit the HP Web site (<http://www.hp.com>) for ordering information.
- Visit the Contact HP Worldwide Web site (<http://welcome.hp.com/country/us/en/wwcontact.html>) for contact information.

Master Boot Record Security

The MBR contains information needed to successfully boot from a disk and to access the data stored on the disk. Master Boot Record Security detects and reports unintentional or malicious changes to the MBR, such as those caused by some workstation viruses or by the incorrect use of certain disk utilities. It also allows you to recover the “last known good” MBR, should changes to the MBR be detected when the system is restarted.

To enable MBR Security:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart**.
- 2 Wait for the **F10=Setup** prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press the **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 3 Select **Security>Master Boot Record Security>Enabled**.
- 4 Select **Security>Save Master Boot Record**.
- 5 Before exiting, select **File>Save Changes and Exit**.

When MBR Security is enabled, the BIOS prevents any changes being made to the MBR of the current bootable disk while in MS-DOS or Windows Safe Mode.



NOTE Most operating systems control access to the MBR of the current bootable disk; the BIOS cannot prevent changes that might occur while the operating system is running.

Each time the workstation is turned on or restarted, the BIOS compares the MBR of the current bootable disk to the previously saved MBR. If changes are detected and if the current bootable disk is the same disk from which the MBR was previously saved, the following message is displayed:

```
1999 - Master Boot Record has changed.  
Press any key to enter Setup to configure MBR Security.
```

Upon entering Computer Setup, you must perform one of the following tasks:

- Save the MBR of the current bootable disk
- Restore the previously saved MBR
- Disable the MBR Security feature

You must know the setup password, if one exists.

If changes are detected and if the current bootable disk is not the same disk from which the MBR was previously saved, the following message is displayed:

```
2000 - Master Boot Record Hard Drive has changed.  
Press any key to enter Setup to configure MBR Security.
```

Upon entering Computer Setup, you must perform one of the following tasks:

- Save the MBR of the current bootable disk
- Disable the MBR Security feature

You must know the setup password, if one exists.

In the unlikely event that the previously saved MBR has been corrupted, the following message is displayed:

```
1998 - Master Boot Record has been lost.  
Press any key to enter Setup to configure MBR Security.
```

Upon entering Computer Setup, you must perform one of the following tasks:

- Save the MBR of the current bootable disk
- Disable the MBR Security feature

You must know the setup password, if one exists.

Before You Partition or Format the Current Bootable Disk

Before you partition or format the current bootable disk, ensure that MBR Security is disabled before you change partitioning or formatting of the current bootable disk. Some disk utilities, such as FDISK and FORMAT, attempt to update the MBR. If MBR Security is enabled when you change partitioning or formatting of the disk, you might receive error messages from the disk utility or a warning from MBR Security the next time the workstation is turned on or restarted.

To disable MBR Security:

- 1 Turn on or restart the workstation. If you are in Windows, click **Start>Shut Down>Restart the Computer**.
- 2 Wait for the **F10=Setup** prompt to appear on the lower right corner of the screen. Once you see the prompt, press the **F10** key to enter the F10 setup utility.



NOTE If you do not press **F10** key at the appropriate time, you must restart the workstation and try again to access the utility.

- 3 Select **Security>Master Boot Record Security>Disabled**.
- 4 Before exiting, select **File>Save Changes and Exit**.

Cable Lock Slot

The rear panel of the chassis can accommodate a cable lock accessory that allows the workstation to be physically secured to a work area.

For illustrated instructions, see “[Cable Lock \(Optional\)](#)” on page 75.

Padlock (Optional)

Prevents entire system theft and discourages access panel removal.

For illustrated instructions, see “[Security Padlock \(Optional\)](#)” on page 75.

Universal Chassis Clamp Lock (Optional)

The version without a cable discourages access panel removal and prevents theft of IO devices. The version with a cable also prevents entire system theft and allows multiple systems to be secured with a single cable.

For illustrated instructions, see “[Universal Chassis Clamp Lock \(Optional\)](#)” on page 76.

Rear Port Controller Cover (Optional)

Locks rear I/O cables to prevent cable theft.

Fingerprint Identification Technology

Eliminating the need to enter user passwords, HP Fingerprint Identification Technology tightens network security, simplifies the login process, and reduces the costs associated with managing corporate networks. Affordably priced, it is not just for high-tech, high-security organizations anymore.

Support for Fingerprint Identification Technology varies by model.

For more information, visit <http://ht8004.www1.hp.com/products/security>.

Fault Notification and Recovery

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

If the workstation is connected to a network managed by HP Client Manager Software, the computer sends a fault notice to the network management application. With HP Client Manager Software, you can also remotely schedule diagnostics to automatically run on all managed PCs and create a summary report of failed tests.

Drive Protection System

The DPS is a diagnostic tool built into the hard drives installed in select HP workstations. DPS is designed to help diagnose problems that might result in unwarranted hard drive replacement.

When HP workstations are built, each installed hard drive is tested using DPS, and a permanent record of key information is written onto the drive. Each time DPS is run, test results are written to the hard drive. Each time DPS is run, test results are written to the hard drive. The service provider can use this information to help diagnose conditions that caused you to run the DPS software.

Ultra ATA Integrity Monitoring

Ultra ATA Integrity Monitoring monitors the integrity of data as it is transferred between an Ultra ATA hard drive and the system's core logic. If the workstation detects an abnormal number of transmission errors, the workstation displays a Local Alert message with recommended actions.

ECC Fault Prediction and Prefailure Warranty

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



NOTE To use this feature, you must replace the standard DIMMs with HP ECC DIMMs.

Surge-Tolerant Power Supply

An integrated surge-tolerant power supply provides greater reliability when the workstation is hit with an unpredictable power surge. This power supply is rated to withstand a power surge of up to 2000 V (Line to PE or Neutral to PE) and 1000 V (Line to Line) without any data loss or system downtime.

Thermal Sensor

The thermal sensor is a hardware and software feature that tracks the internal temperature of the workstation. When combined with HP Client Manager Software, this feature notifies the network administrator when the normal range is exceeded.

The thermal sensor monitors the processor temperature and if the temperature gets too hot, the processor clock automatically begins to throttle. If the temperature does not go down, then the system eventually shuts down.

Chapter 4 Removal and Replacement

This chapter discusses removal and replacement procedures for the HP Workstation xw4200. This chapter includes the following sections:

- “Service Considerations” on page 68
- “Pre-Disassembly Procedures” on page 73
- “Removal and Replacement of Components” on page 73

Service Considerations

The following sections discuss service considerations that should be reviewed and practiced before removing and replacing any system components.



WARNING! When lifting or moving the workstation, do not use the front bezel as a handle or lifting point. Lifting the workstation from the front bezel or lifting it incorrectly could cause the unit to fall and harm the user and damage the workstation. To properly and safely lift the workstation, lift it from the bottom of the unit.

Read Cautions, Warnings, and Safety Precautions

For your safety, you must review the [“Important Safety Warnings” on page vii](#) before accessing the components of the workstation. Also, review the *Safety and Regulatory Guide* that came with your workstation for more information.

Electrostatic Discharge Information

A sudden discharge of static electricity from your finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) might not appear to be affected at all and can work perfectly throughout a normal cycle. The device might function normally for a while, but it has been degraded in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

Generating Static

The following table shows that:

- Different activities generate different amounts of static electricity.
- Static electricity increases as humidity decreases.

Table 4-1 Generating Static Electricity

Event	Relative Humidity		
	55%	40%	10%
Walking across carpet	7,500 V	15,000 V	35,000 V
Walking across vinyl floor	3,000 V	5,000 V	12,000 V
Motions of bench worker	400 V	800 V	6,000 V
Removing bubble pack from PCB	7,000 V	20,000 V	26,500 V
Packing PCBs in foam-lined box	5,000 V	11,000 V	21,000 V

NOTE: 700 volts can degrade a product.

Preventing Electrostatic Damage to Equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity. The following packaging and grounding precautions are necessary to prevent damage to electric components and accessories.

- Transport products in static-safe containers, such as tubes, bags, or boxes to avoid hand contact.
- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic sensitive parts in their containers until they arrive at static-free stations.
- Place items on a grounded surface before removing them from their container.
- When handling or touching a sensitive component or assembly, ground yourself by touching the chassis.
- Avoid contact with pins, leads, or circuitry.
- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Personal Grounding Methods and Equipment

To prevent static electricity damage to equipment, use the following equipment:

- Wrist straps are flexible straps with a maximum of one-megohm \pm 10% resistance in the ground cords. To provide proper ground, wear the strap against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.
- Heel straps, toe straps, and boot straps can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of one-megohm \pm 10% resistance between the operator and ground.

The following table shows static shielding protection levels.

Table 4-2 Static Shielding Protection Levels

Method	Voltage
Antistatic plastic	1,500
Carbon-loaded plastic	7,500
Metallized laminate	15,000

Grounding the Work Area

To prevent static damage at the work area:

- Cover the work surface with approved static-dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Use static-dissipative mats, foot straps, or air ionizers to give added protection.
- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.
- Turn off power and input signals before inserting and removing connectors or test equipment.
- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.

- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- Use field service tools, such as cutters, screwdrivers, and vacuums, that are conductive.

Recommended Materials and Equipment

Materials and equipment that are recommended for use in preventing static electricity include:

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins and other assembly or soldering aids
- Conductive foam
- Conductive tabletop workstations with ground cord of one-megohm \pm 10% resistance
- Static-dissipative table or floor mats with hard tie to ground
- Field service kits
- Static awareness labels
- Wrist straps and footwear straps providing one-megohm \pm 10% resistance
- Material handling packages
- Conductive plastic bags
- Conductive plastic tubes
- Conductive tote boxes
- Opaque shielding bags
- Transparent metallized shielding bags
- Transparent shielding tubes

Tools and Software Requirements

To service the workstation, you might need the following equipment:

- Torx T-15 screwdriver or Flat-bladed screwdriver (can be used in place of the Torx screwdriver)
- Phillips screwdriver (to remove the rear fan, if necessary)
- Diagnostics software
- Tamper-resistant T-15 wrench (FailSafe key) or tamper-resistant bits (required if you get locked out by the solenoid hood lock)

Screws

The screws used in the workstation are not interchangeable. The screws might have standard or metric threads and might be of different lengths. If an incorrect screw is used during the reassembly process, it can damage the unit. HP recommends that all screws removed during disassembly be kept with the part that was removed, then returned to their proper locations.



NOTE Metric screws have a black finish. American National (unified) screws have a silver finish.

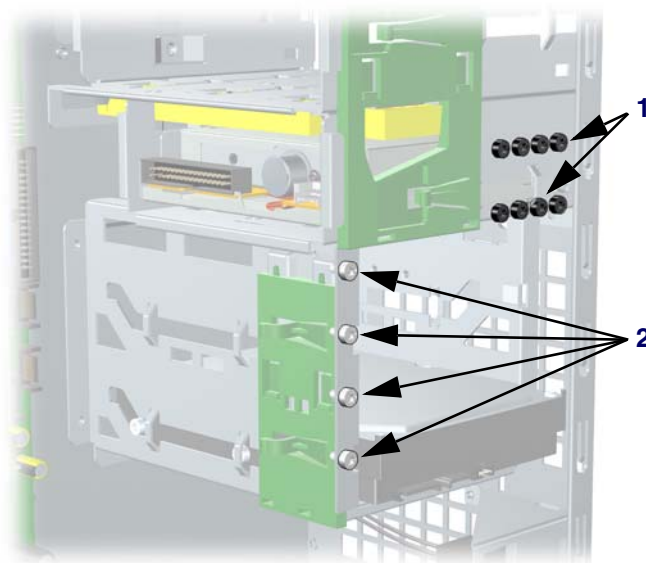


NOTE As each subassembly is removed from the workstation, place the subassembly away from the work area to prevent damage.

If necessary, additional drive guide screws are provided on the system chassis. There are eight Metric screws located on the chassis near the 5.25-inch optical drive bays. These screws can be used to mount additional optical drives or an optional diskette drive. There are four American National screws located on the chassis near the hard drive. These screws can be used to mount additional hard drives in the 3.5" hard drive cage. For more information about this procedure, see [“Installing Hard Drives in the 5.5” slot \(Optional\)” on page 112.](#)



NOTE The Metric (black) and American National (silver) screws are not interchangeable.



1 Metric screws (8)

2 American National screws (4)

Special Handling of Components

The following components require special handling when servicing the workstation.



WARNING! Do not use the front bezel as a handle or lifting point when lifting or moving the workstation. Lifting the workstation from the front bezel or lifting it incorrectly could cause the unit to fall and cause harm to the user and damage to the workstation. To properly and safely lift the workstation, lift it from the bottom of the unit from either the desktop or minitower configuration.

Cables and Connectors

Cables must be handled with care to avoid damage. Apply only the tension required to seat or unseat the cables during insertion or removal from the connector. Handle cables by the connector whenever possible. In all cases, avoid bending or twisting the cables, and ensure that the cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced.



CAUTION When servicing this workstation, ensure that cables are placed in their proper location during the reassembly process. Improper cable placement can damage the workstation.

Hard Drives

- Handle hard drives as delicate, precision components, avoiding all physical shock and vibration. This applies to failed drives as well as replacement spares.
- If a drive must be mailed, place the drive in a bubble-pack mailer or other suitable protective packaging and label the package “Fragile: Handle With Care.”
- Do not remove hard drives from the shipping package for storage. Keep hard drives in their protective packaging until they are actually mounted in the workstation.
- Avoid dropping drives from any height onto any surface.
- If you are inserting or removing a hard drive, turn off the workstation. Do not remove a hard drive while the workstation is on or in standby mode.
- Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector. For more information about preventing electrostatic damage, see [“Electrostatic Discharge Information” on page 68](#).
- Do not use excessive force when inserting a drive.
- Avoid exposing a hard drive to liquids, temperature extremes, or products that have magnetic fields, such as monitors or speakers.

Lithium Coin Cell Battery

The battery that comes with the workstation provides power to the real-time clock and has a minimum lifetime of about three years.

For instructions on battery removal and replacement procedures, see [“Battery” on page 100](#).



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



CAUTION Do not dispose of batteries, battery packs, and accumulators together with the general household waste.



Pre-Disassembly Procedures

Before servicing the workstation:

- 1 Remove/disengage any security devices that prohibit opening the workstation.
- 2 Close any open software applications.
- 3 Remove any diskette or compact disc from the workstation.
- 4 Exit the operating system.
- 5 Turn off the workstation and any peripheral devices that are connected to it.
- 6 Remove/disengage any security devices that prohibit opening the workstation.



CAUTION Turn off the workstation before disconnecting any cables.



CAUTION The cooling fan is off **only** when the workstation is turned off or the power cable has been disconnected. The cooling fan is always on when the workstation is in the “On,” “Standby,” or “Suspend” modes. You must disconnect the power cord from the power source before opening the workstation to prevent system board or component damage.

- 7 Disconnect the power cord from the electrical outlet and then from the workstation.
- 8 Disconnect all peripheral device cables from the workstation. For more information, see [“Electrostatic Discharge Information” on page 68](#).

Removal and Replacement of Components

This section discusses the procedures necessary to remove and install various hardware components on your workstation. Review the safety and precautions and the [“Service Considerations” on page 68](#), as well as the *Safety and Regulatory Guide*, before servicing or upgrading your system.

- 1 Read all safety information and precautions.
- 2 Locate and clear a suitable work area.
- 3 Shut down the system and remove power from the unit.
- 4 Gather your tools.
- 5 Service your unit.
- 6 Restore power to your unit.

Disassembly Order

Use the following table to determine the order in which to remove the major components.

Pre-Disassembly (page 73)
Locks (page 75)
Access (Hood) Panel (page 77)
Access Panel (Hood) Sensor (page 78)
Front Bezel (page 80)
Front Panel I/O Assembly (page 83)
Power Button (page 84)
System Speaker (page 87)
Optical Drive (page 102)
Diskette Drive (page 106)
Bezel Blanks (page 80)
Power Supply (page 85)
System Fan (page 86)
Memory (page 93)
Battery (page 100)
Hard Drive (page 107)
Processor Heatsink (page 88)
Processor (page 91)
System Speaker (page 87)
PCI or PCI Express Cards (page 98)
System Board (page 114)

Security Padlock (Optional)

If a security padlock is installed, remove it before servicing the unit. To remove the padlock, unlock it and slide it out of the padlock loop as shown in the following illustration.



Cable Lock (Optional)

If a cable lock is installed, remove it before servicing the unit. To remove the cable lock, unlock it and pull it out of the cable lock slot as shown in the following illustration.



Universal Chassis Clamp Lock (Optional)

If a universal chassis clamp lock is installed, remove it before servicing the unit. To remove the noble lock:

- 1 Unlock the screw cover from the universal clamp as shown in the following illustration.



- 2 Unscrew the universal clamp from the unit as shown in the following illustration.



Access Panel

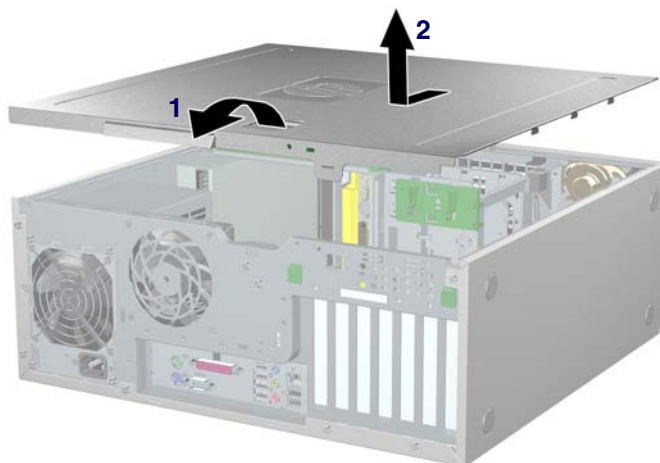
Before accessing the internal components of the HP Workstation xw4200, the access panel must be removed.

To remove the panel:



WARNING! Ensure that the workstation is turned off and that the power cord is disconnected from the electrical outlet before removing the workstation access panel.

- 1 Disconnect power from the system ([page 73](#)) and, if necessary, unlock the security lock and cable lock ([page 75](#)), and disconnect the universal clamp lock ([page 76](#)).
- 2 Lay the unit in the desktop position as shown in the following illustration.
- 3 Pull up and out on the cover latch **1** and at the same time slide the cover **2** away from the bezel and then lift up.



To replace the access panel, lay it flat on the unit about one inch from the bezel. The hooks should fall into the recesses. Then slide the cover towards the bezel until it snaps into place.

Access Panel (Hood) Sensor (Optional)

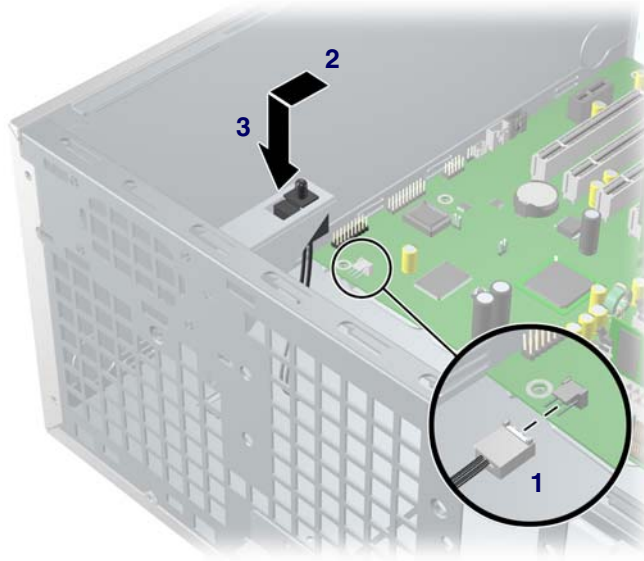
To remove the hood sensor:

- 1 Disconnect power from the system ([page 73](#)) and remove the access panel ([page 77](#)).
- 2 Disconnect the hood sensor **1** from the system board.
- 3 Slide the hood sensor **2** forward as shown in the following illustration.



CAUTION The hood sensor bracket and the chassis contain sharp edges that present a safety hazard. Be careful when sliding the hood sensor forward.

- 4 Pull the hood sensor **3** down and remove it from the chassis.

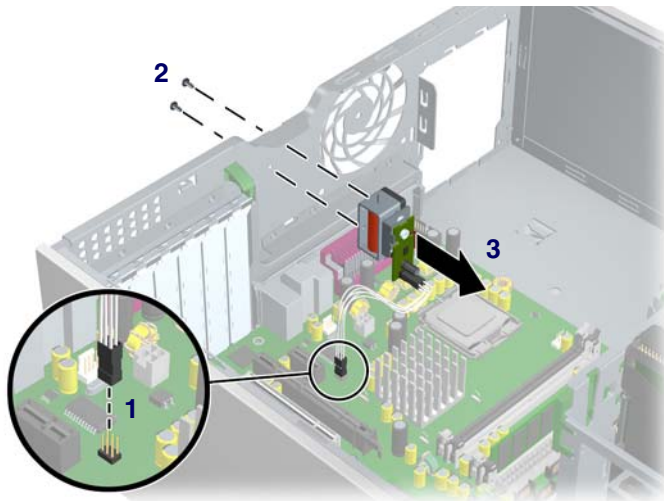


To replace the hood sensor, reverse the previous steps.

Solenoid Hood (Smart Cover) Lock (Optional)

To remove the solenoid lock:

- 1 Disconnect power from the system ([page 73](#)) and remove the access panel ([page 77](#)).
- 2 Disconnect the access panel lock cable **1** from the system board.
- 3 Using the FailSafe key, unscrew the two screws **2** from the back of the chassis as shown in the following diagram.
- 4 Slide the access panel lock assembly **3** away from the chassis and out of the unit.

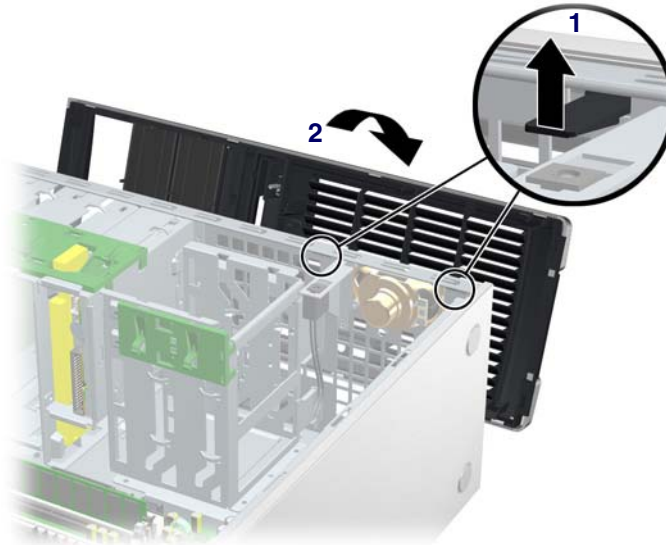


To replace the access panel lock assembly, reverse the previous steps.

Front Bezel

To remove the bezel:

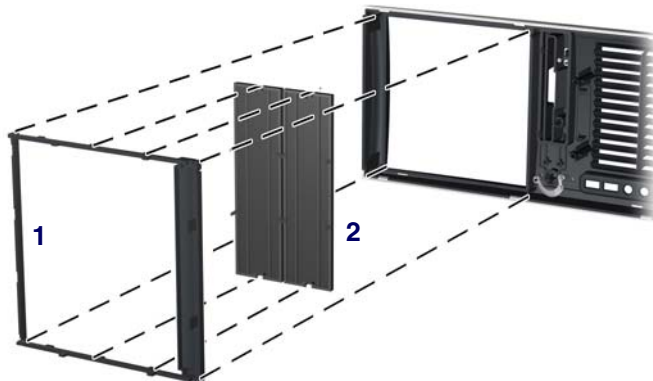
- 1 Disconnect power from the system ([page 73](#)) and remove the access panel ([page 77](#)).
- 2 Lift up on the two tabs **1** located on the front bezel.
- 3 Rotate the front bezel **2** away from the chassis as shown in the following illustration and remove the bezel.



Bezel Blanks

To remove the bezel blanks:

- 1 Disconnect power from the system ([page 73](#)), and remove the access panel ([page 80](#)) and front bezel. After removing the front bezel, gently pull the subpanel **1**, with the bezel blanks secured in it, away from the front bezel.
- 2 Remove the desired bezel blank **2** by pulling the blank away from the subpanel.



NOTE The bezel blanks are keyed to assist you in replacing the blanks. Also, the subpanel can be rotated 90 degrees to install the optical drives in desktop orientation, if desired.

Chassis Feet

The HP Workstation xw4200 ships in a minitower configuration and chassis feet are installed on the base of the workstation. The unit ships with additional feet should you convert the unit to a desktop.

To install the chassis feet on a desktop-oriented workstation:

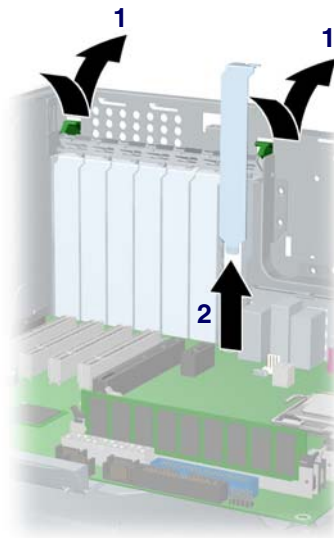
- 1 Situate the unit into the appropriate position as shown in the following illustration.
- 2 Place the feet into the embossed areas of the unit.



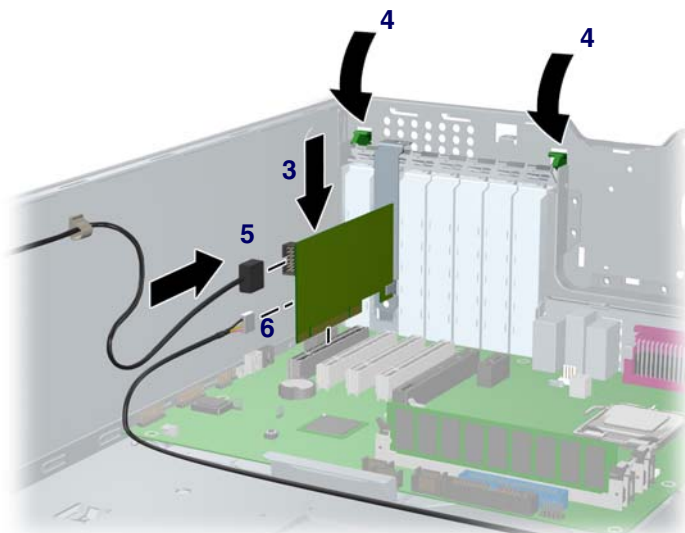
IEEE-1394 (Optional)

To install an optional IEEE-1394 adapter:

- 1 Unlatch the PCI levers **1** and the PCI slot cover **2**.



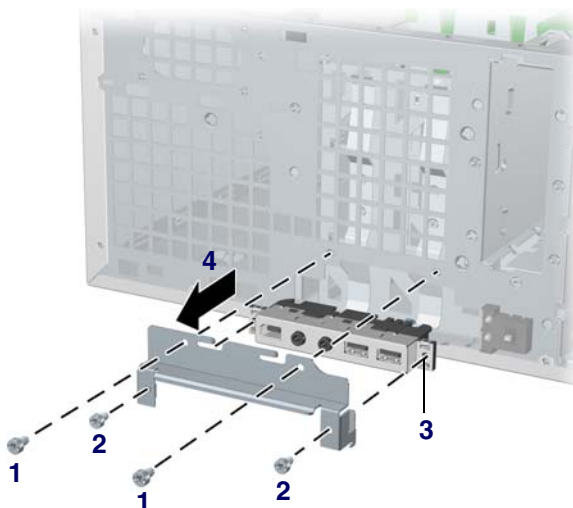
- 2 Install the IEEE-1394 card **3** into the PCI socket.
- 3 Close the PCI levers **4**.
- 4 Connect the front I/O cable **5** and power cable **6** into the card.
- 5 Remove the sticker covering the front IEEE-1394 connector.



Front Panel I/O Assembly

To remove the front panel I/O assembly:

- 1 Disconnect power from the system (page 73), remove the access panel (page 77), and remove the front bezel (page 80).
- 2 Disconnect the front panel I/O assembly cable from the system board.
- 3 Remove the two screws **1** that hold the assembly bracket to the chassis as shown in the following illustration.
- 4 Remove the two screws **2** that hold the bracket and assembly together and separate the shield away from the front panel I/O assembly **3**.
- 5 Slide the front panel I/O assembly **4** (with bracket attached) out about two inches away from the chassis.



WARNING! The next step requires the removal of cables through the chassis. Some edges on the chassis might be sharp. Care must be taken when removing these cables.

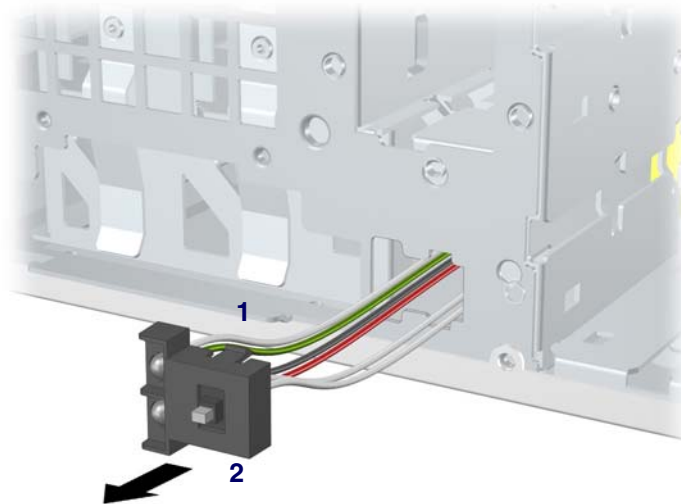
- 6 Slide the front panel cables through the chassis and out the front of the unit.

To replace the front panel I/O assembly, reverse the previous steps.

Power Button Assembly

To remove the front power button assembly:

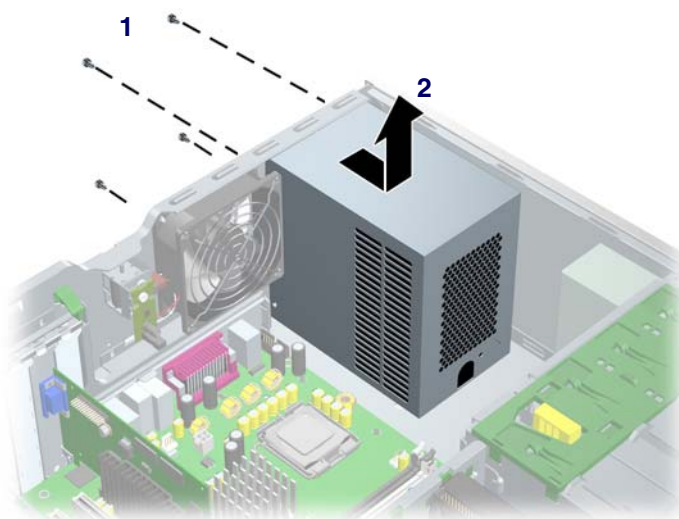
- 1 Disconnect power from the system ([page 73](#)), remove the access panel ([page 77](#)), remove the front bezel ([page 80](#)), and remove the front panel I/O assembly ([page 83](#)).
- 2 Disconnect the power assembly cable from the system board.
- 3 Press the clips at the top **1** and bottom **2** of the power assembly, then slide the assembly out from the front of the chassis as shown in the following illustration.



Power Supply

To remove the power supply:

- 1 Disconnect power from the system ([page 73](#)) and remove the access panel ([page 77](#)).
- 2 Disconnect the power supply from the system board.
- 3 Disconnect all devices (optical drives, diskette drive, hard drives, and on select models, the graphics card and IEEE-1394 card) from the power supply.
- 4 Remove the four screws **1** from the back panel.



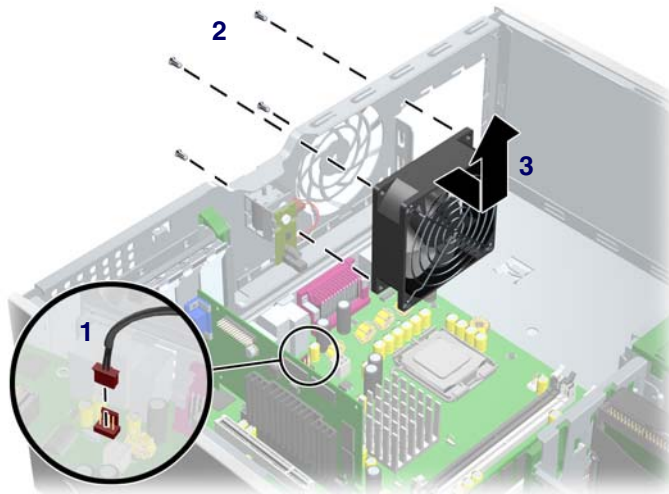
- 5 Slide the power supply **2** toward the front and lift up to remove it from the chassis.

To install the power supply, reverse the previous steps.

System Fan

To remove the system fan:

- 1 Disconnect power from the system ([page 73](#)) and remove the access panel ([page 77](#)).
- 2 Disconnect the fan connector **1** from the system board.
- 3 Remove the four screws **2** from the back of the chassis back panel with a Phillips screwdriver.



- 4 Slide the fan **3** toward the front of the unit and remove it.

To replace a system fan, reverse the previous steps.



CAUTION When installing the system fan, ensure that the fan is situated so that the airflow direction is going out of the chassis.

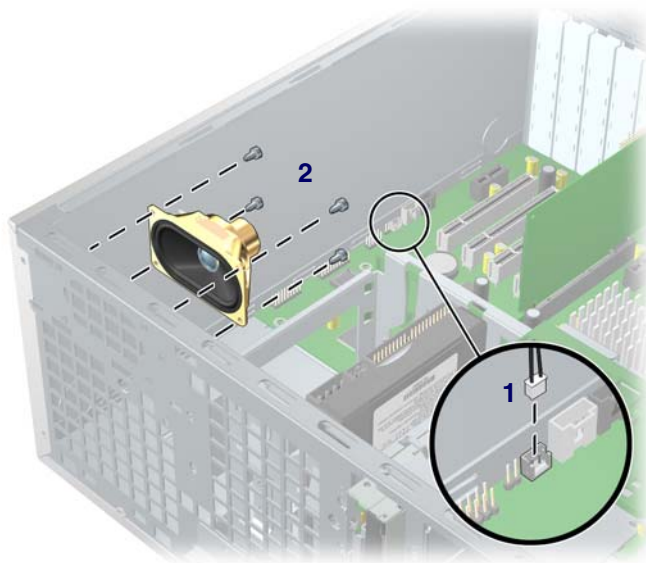


NOTE This system only supports 4-wire fans.

System Speaker

To remove the speaker:

- 1 Disconnect power from the system ([page 73](#)) and remove the access panel ([page 77](#)).
- 2 Disconnect the speaker **1** from the system board.
- 3 Remove the four screws **2** as shown in the following illustration.



- 4 Pull the speaker out of the chassis.

To replace the speaker, reverse the previous steps.

Processor Heatsink



NOTE The following illustrated heatsink is typical of what you might have in your workstation. Be aware that different versions of the heatsinks exist, but the overall procedures listed are sufficient to assist you in removing the heatsink.

Removing the Heatsink

To remove the heatsink:

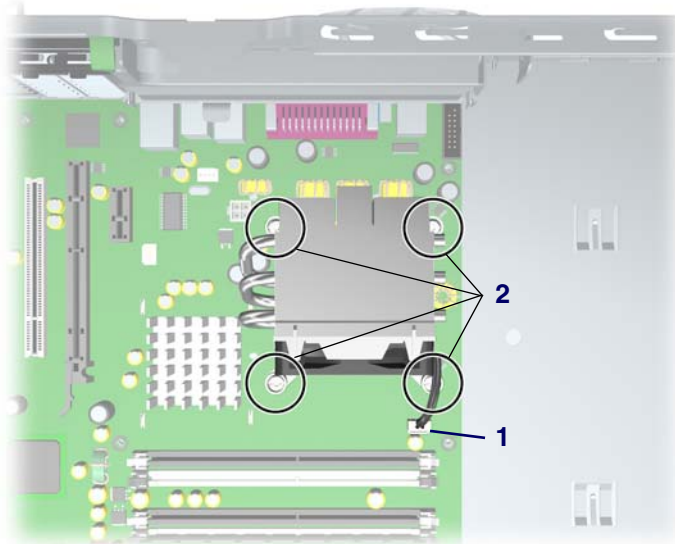
- 1 Turn on the workstation and enter Computer Setup (F10) ([page 34](#)). Let the workstation run in this mode for five minutes.

This action warms the thermal interface material between the heatsink and processor so that the thermal bond loosens, and can more easily be broken.



NOTE Windows in idle state does not provide sufficient heat to warm the compound.

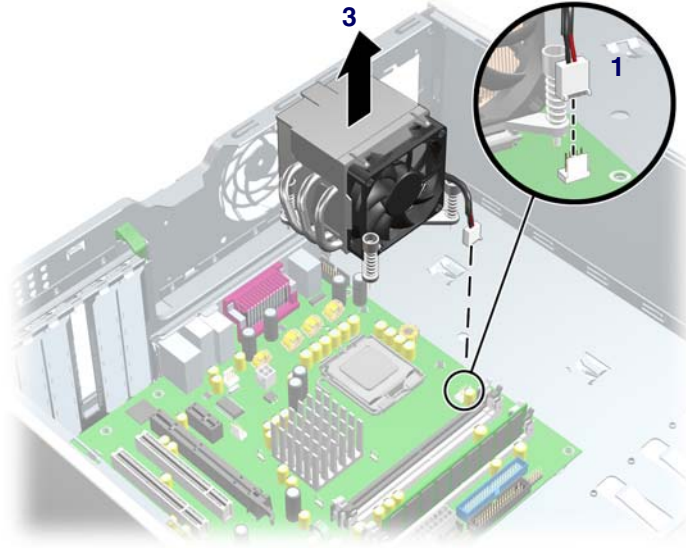
- 2 After warming the thermal interface, shut down the system, disconnect power from the system ([page 73](#)), and remove the access panel ([page 77](#)).
- 3 Disconnect the heatsink wire **1** from the system board as shown in the two illustrations below.
- 4 Remove the captured heatsink screws **2** from the system board. Begin by slightly loosening any two screws that diagonally opposite from one another, then slightly loosen the other two. Then finish removing the screws.
- 5 Gently twist the heatsink unit to break the thermal grease binding.



- Lift the heatsink **3** unit. Use alcohol and a soft cloth to clean all the thermal interface material residue from the processor heatsink and processor.



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



Replacing the Heatsink

To replace the heatsink:

- 1 Disconnect power from the system ([page 73](#)), remove the access panel ([page 77](#)), and remove the heatsink ([page 88](#)).
- 2 Use alcohol and a soft cloth to clean all the thermal interface material residue from the processor heatsink and processor.



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

Apply new thermal grease between the heatsink and processor, then reverse the previous steps. Do not fully tighten one screw, then move on to the next. Tighten all screws a little at a time, making sure the processor remains level.

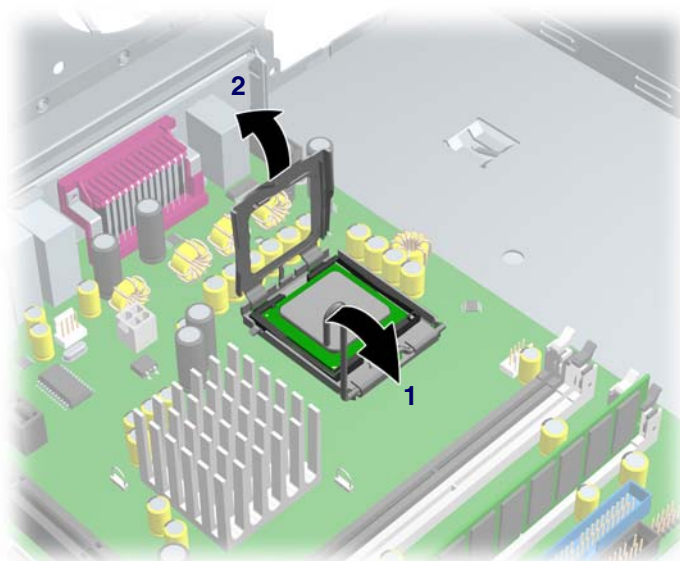


NOTE This system only supports 4-wire fans.

Processor

To remove the processor:

- 1 Disconnect power from the system ([page 73](#)), remove the access panel ([page 77](#)), and remove the heatsink ([page 88](#)).
- 2 Raise the lever **1** on the processor socket handle and open the cover **2**.



- 3 Pull the processor **3** straight out of the socket.



CAUTION If you damage the spring-loaded contacts in the socket, the system board may be damaged and your warranty voided.





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

To replace the processor:

- 1 Raise the processor socket handle fully (the full swing angle of the lever is approximately 135 degrees).



CAUTION The contacts in the socket are delicate. Use extreme care when placing the processor in the socket.

- 2 Line up the triangle on the corner of the processor with the triangle on the corner of the processor socket and install the processor into the socket. Ensure that the underside of the processor is level with the top of the top of the processor socket. Lightly press down on the top of the processor while closing the socket lever.

Memory

The HP Workstation xw4200 has four memory sockets. The system supports industry-standard, 240-pin DDR2 DIMMs.

The system can support up to 4 GB of memory (1-GB DIMM in each socket). Although a single 128-MB DIMM configuration is possible (on XMM1 only), always install DIMMs in pairs for optimal dual-channel operation.

Memory Module Requirements

- Use only industry standard, unbuffered, PC2-3200 or PC2-4300 DIMMs.
- Install unbuffered DDR2 DIMMs in pairs of matched size and type.
- Registered memory is not supported.

Removing Memory Module

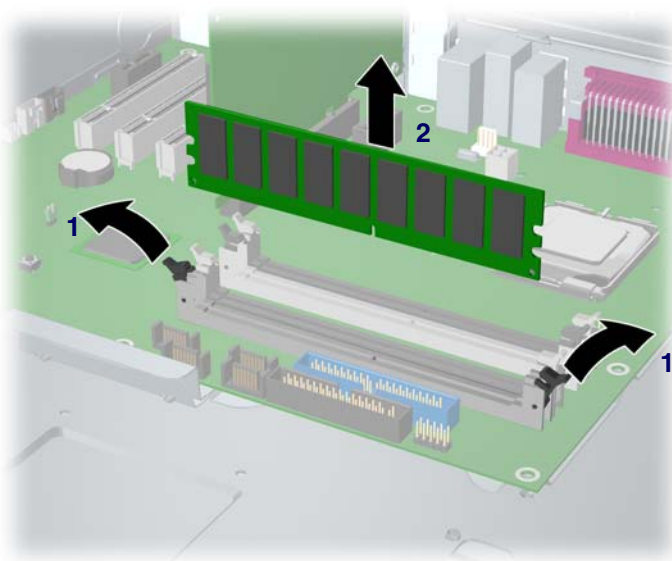
To remove DIMMs from the unit:

- 1 Disconnect power from the system ([page 73](#)), remove the access panel ([page 77](#)), and lay 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 might be damaged and the system will not recognize the memory changes.

- 2 Gently push outwards on the socket levers **1** as shown in the following illustration.
- 3 Lift the DIMM **2** straight up and remove it from the unit.



To replace memory, reverse the previous steps.

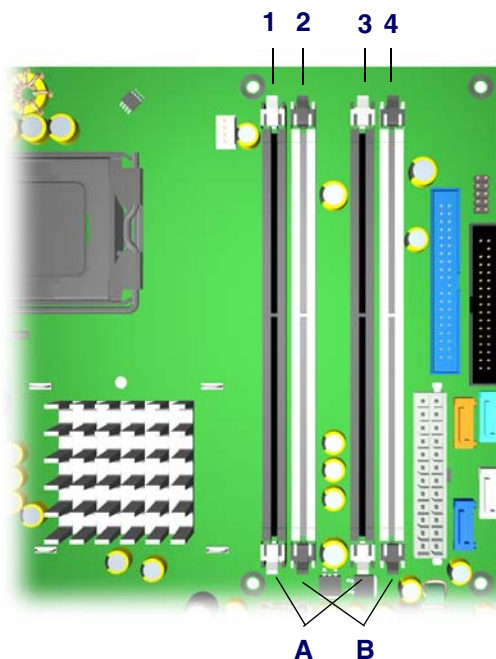


NOTE DIMMs and the DIMM sockets are keyed for proper installation. Make sure the guides line up when installing a DIMM.

Installing Memory Module

You must load memory modules in valid configurations.

- If using only one DIMM, install it in socket 1
- Load the first DIMM pair A into sockets 1 and 3.
- Load the second DIMM pair B into sockets 2 and 4.



Peripheral Component Interconnect (PCI) Slots

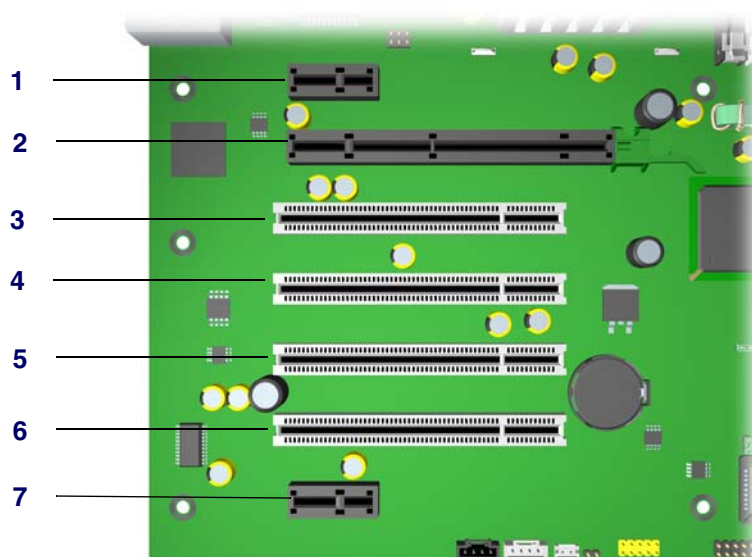


Table 4-3 PCI Slots

Slot	Type	Ref	IDSEL	INTs	PME
1	PCI Express x1	J34	N/A	A B C D	PCI_EXP_WAKE#
2	PCI Express x16	J41	N/A	A B C D	PCI_EXP_WAKE#
3	PCI	J20	AD20	A C F G	P_PME#
4	PCI	J21	AD25	C F G A	P_PME#
5	PCI	J22	AD26	F G A C	P_PME#
6	PCI	J23	AD27	G A C F	P_PME#
7	PCI Express x1	J31	N/A	A B C D	PCI_EXP_WAKE#

Table 4-4 PCI Devices List

Device	Bus	Dev	FN	PFA	Interrupts
Processor to I/O Controller	0	0	0	0000	
MCH PCI Express Root Port (slot 2)	0	1	0	0008	A
ICH6R PCI Express Root Port (Slot 1)	0	28	0	00E0	A
ICH6R PCI Express Root Port (Slot 7)	0	28	1	00E1	B
ICH6R PCI Express Root Port (LAN)	0	28	3	00E3	D

Table 4-4 PCI Devices List

Device	Bus	Dev	FN	PFA	Interrupts
ICH6R USB Universal Host Controller	0	29	0	00E8	A
ICH6R USB Universal Host Controller	0	29	1	00E9	B
ICH6R USB Universal Host Controller	0	29	2	00EA	C
ICH6R USB Universal Host Controller	0	29	3	00EB	D
ICH6R USB2 Enhanced Host Controller	0	29	7	00EF	A
ICH6R PCI Bridge	0	30	0	00F0	
ICH6R AC '97	0	30	2	00F2	A
ICH6R LPC Interface Controller	0	31	0	00F8	
ICH6R Ultra ATA Storage Controllers	0	31	1	00F9	A
ICH6R SATA Controller	0	31	2	00FA	B
Slot 2 (PCI Express x16)	1	0	0	0100	ABCD
Slot 3 (PCI)	5	4	0	0520	ACFG
Slot 4 (PCI)	5	9	0	0548	CFGA
Slot 5 (PCI)	5	10	0	0550	FGAC
Slot 6 (PCI)	5	11	0	0558	GACF
Slot 1 (PCI express x1)	32	0	0	2000	ABCD
Slot 7 (PCI Express x1)	64	0	0	4000	ABCD
Gigabit LAN Controller	128	0	0	8000	A

PCI Express

PCI Express is a new hardware interconnect standard (for example, I/O slots). PCI Express is point-to-point architecture and uses a serial data transmission protocol. A single PCI Express lane consists of 4 wires and is capable of transmitting 250 MB/sec in a single direction or 500 MB/sec in both directions simultaneously. This bandwidth is not affected by what is happening on other PCI Express buses or legacy PCI/PCI-X buses (provided that total bandwidth can be handled by the CPU and the memory subsystem). The transmission protocol is somewhat similar to that used for a LAN connection and contains error correction and detection, packet addressing and other network features.

PCI Express improves system attributes. PCI Express enables a low-power, scalable, high-bandwidth communication path with a small number of connections (wires) compared to traditional parallel interfaces (for example, PCI).

The PCI Express I/O slots can support other PCI Express cards with lesser bus bandwidth than what is physically defined for the slot. Use the following table to determine compatibility.

For example, a PCI Express x4 card does not work in a PCI Express x16 slot, but a PCI Express x16 card works in a PCI Express x16 slot.

Table 4-5 PCI Express Compatibility Matrix for xw4200

	PCI Express x1 Slot	PCI Express x4 Slot	PCI Express x8 Slot	PCI Express x16 Slot
PCI Express x1 Card	Y	not available	not available	Y
PCI Express x4 Card	N	not available	not available	N
PCI Express x8 Card	N	not available	not available	N
PCI Express x16 Card	N	not available	not available	Y

PCI or PCI Express Removal

To remove a PCI or PCI Express card:

- 1 Disconnect power from the system ([page 73](#)), remove the access panel ([page 77](#)), lay the workstation on its side with the system board facing up, and remove the PCI retainer ([page 97](#)).
- 2 Lift the PCI levers **1** by first pressing down on them and then out.
- 3 Lift the PCI card (**2**, left) out of the chassis. If removing a PCI Express card (**2**, right), remove the power supply cable (not shown), if required, and move the “hockey stick” lever **3** to release the card and lift it out of the chassis. Store the card in an anti-static bag.
- 4 Close the PCI levers.

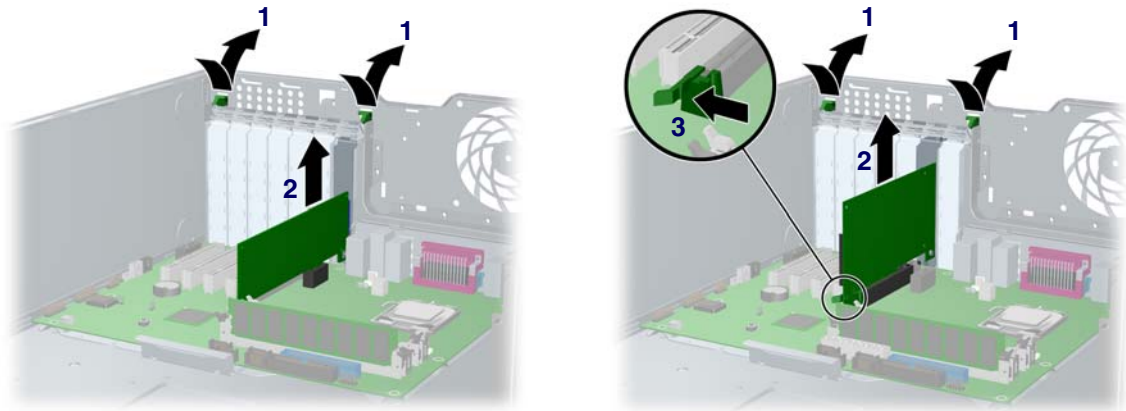


Figure 4-1 PCI card removal (left) and PCI Express card removal (right)

PCI or PCI Express Installation

To install a PCI or PCI Express card:

- 1 Disconnect power from the system (page 73), remove the access panel (page 77), lay the workstation on its side with the system board facing up, and remove the PCI retainer (page 97).
- 2 Lift the PCI levers 1 by first pressing down on them and then out.
- 3 Remove the PCI slot cover 2.
- 4 Install the PCI card (3, left) or PCI Express card (3, right) into the chassis. Verify that the keyed components of the card align with the PCI socket. If installing a PCI Express card, plug in the power supply cable, if required.
- 5 Close the PCI levers 4. If the PCI levers do not close, be sure all cards are properly seated and then try again.
- 6 If installing a PCI Express card, plug in the power supply cable 5, if required.

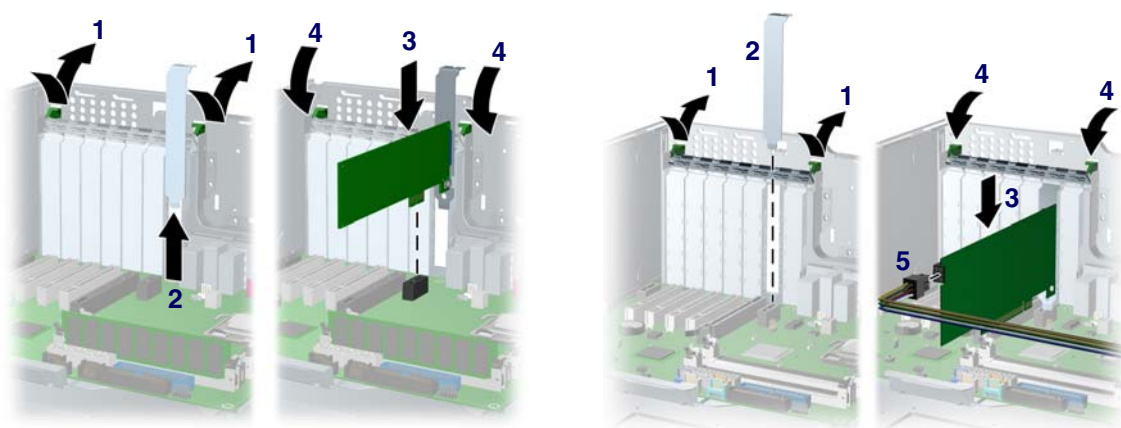


Figure 4-2 PCI card installation (left) and PCI Express Card Installation (right)

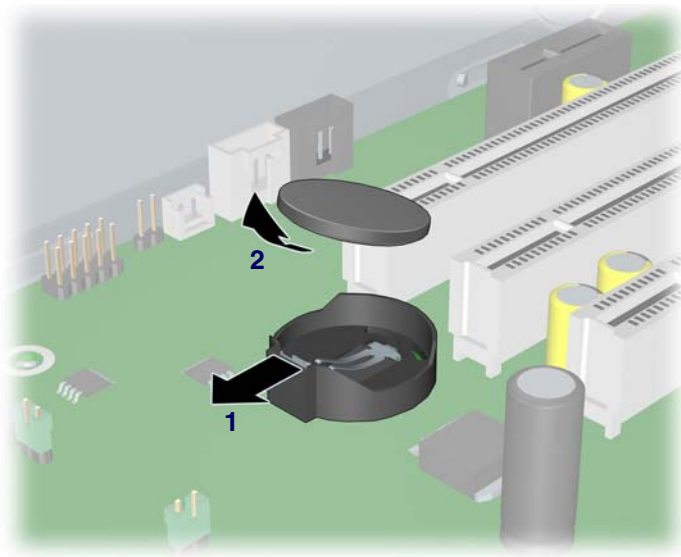
Battery



CAUTION Back up your CMOS (complementary metal oxide semiconductor) settings before removing the battery, as all CMOS settings will be lost when the battery is removed. To back up the CMOS settings, in (F10 Setup click **File>Replicated Setup>Save to Removable Media**).

To remove the battery:

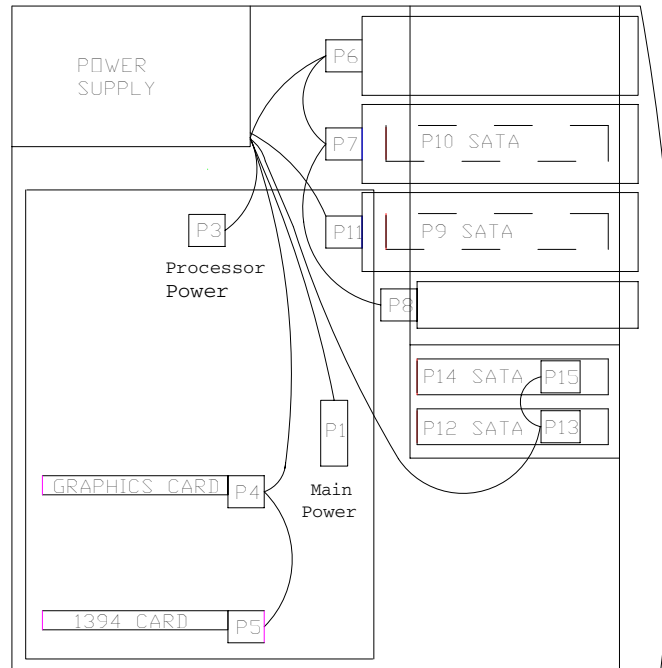
- 1 Disconnect power from the system ([page 73](#)), remove the access panel ([page 77](#)), and lay the workstation on its side with the system board facing up.
- 2 Press on the release tab **1** of the battery holder as shown in the following illustration.
- 3 Slide and lift the battery **2** out.



To install the battery, slide the battery back in until it snaps back into place.

Power Connections to Drives

For help in identifying power cables, refer to the following illustration. Route or tie cables so that they cannot interfere with the heatsink fans.



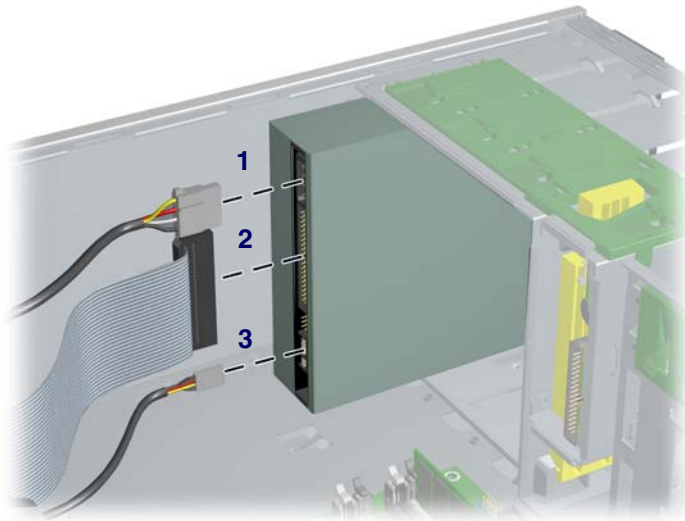
Optical Drive (Minitower Position)

To remove an optional optical drive, you must first release the drivelock. To release the optical drive:

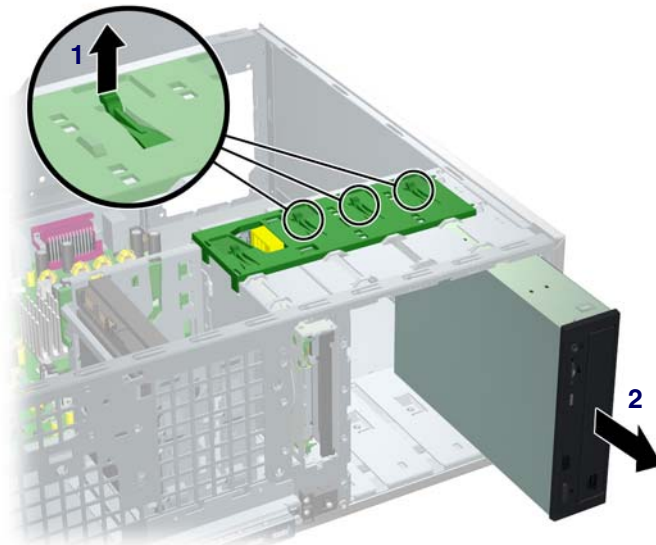
- 1 Disconnect power from the system (page 73), remove the access panel (page 77), and lay the workstation on its side with the system board facing up.
- 2 Disconnect the power **1**, drive **2**, and audio **3** cables from the drive.



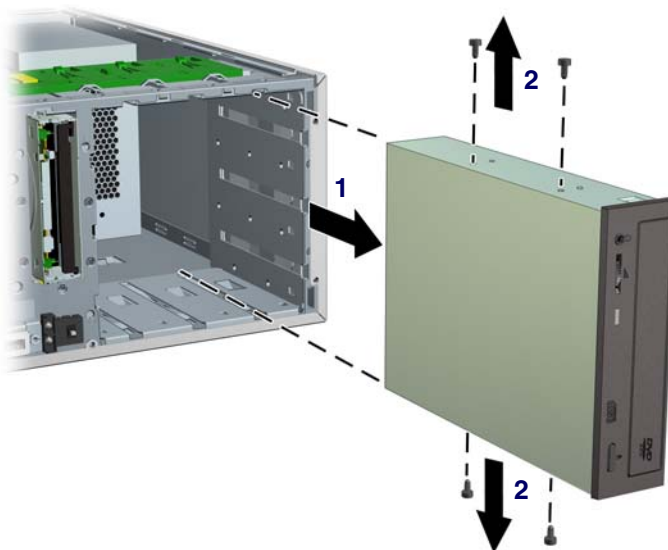
NOTE The audio cable is included with Linux-based systems only. Windows-based systems do not require the audio cable.



- 3 After removing the front bezel and bezel blanks, lift the green drivelock release lever **1** and gently slide the drive **2** out of the chassis.



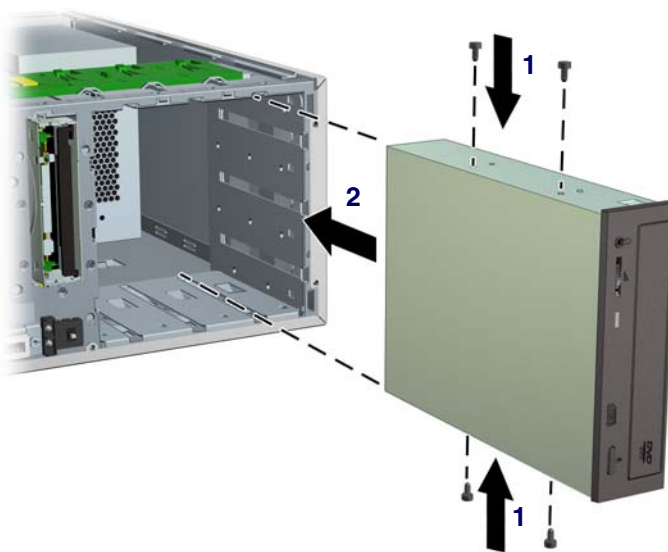
- 4 After pulling the drive **1** out, remove the four guide screws **2** from the drive.



- 5 Verify the jumper settings of the new drive are set correctly.
- 6 To install a drive, first remove the front bezel ([page 80](#)) and bezel blanks ([page 80](#)). Insert the four guide screws **1** into the drive. Align the screws with the slots on the drive, and slide the drive **2** into the unit until it snaps into place.



NOTE All optical drives may not fit in the bottom optical bay due to interference with the system board. Check the fit of your drive before installing it into the bay.



- 7 Connect the drive, power, and audio cables.



NOTE The audio cable is included with Linux-based systems only. Windows-based systems do not require the audio cable.

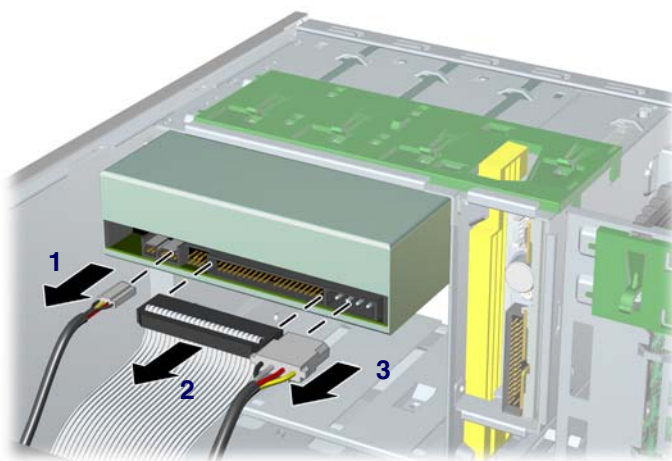
Optical Drive (Desktop Position)

To remove an optional optical drive, you must first release the drivelock. To release the optical drive:

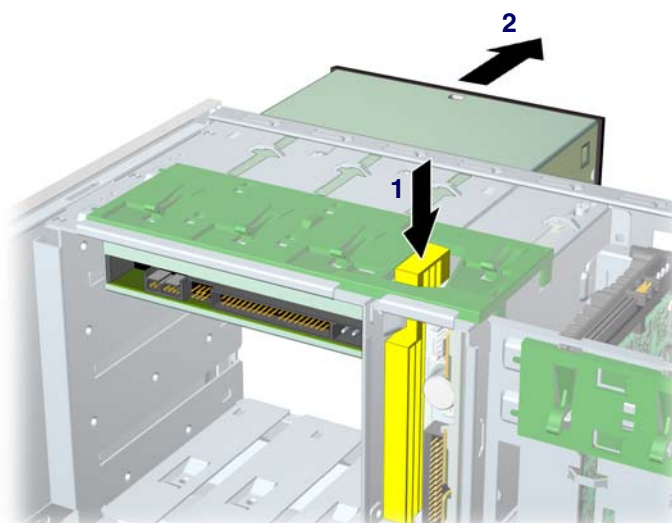
- 1 Disconnect power from the system ([page 73](#)), remove the access panel ([page 77](#)), and lay the workstation on its side with the system board facing up.
- 2 Disconnect the audio **1**, drive **2**, and power **3** cables from the drive.



NOTE The audio cable is included with Linux-based systems only. Windows-based systems do not require the audio cable.



- 3 After removing the front bezel and bezel blanks, press down on the yellow drivelock. As you press on the yellow drivelock **1**, gently slide the drive **2** out of the chassis.



- 4 After pulling the drive **1** out, remove the four guide screws **2** from the drive.



- 5 Verify the jumper settings on the new drive are set correctly.
- 6 To install a drive, insert the four guide screws **1** into the drive. Align the screws with the slots on the drive, and slide the drive **2** into the unit until it snaps into place.



- 7 Connect the drive, power, and audio cables.

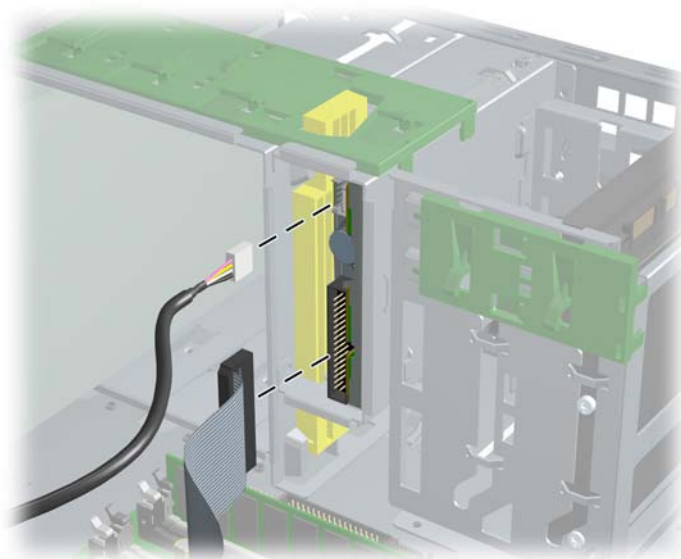


NOTE The audio cable is included with Linux-based systems only. Windows-based systems do not require the audio cable.

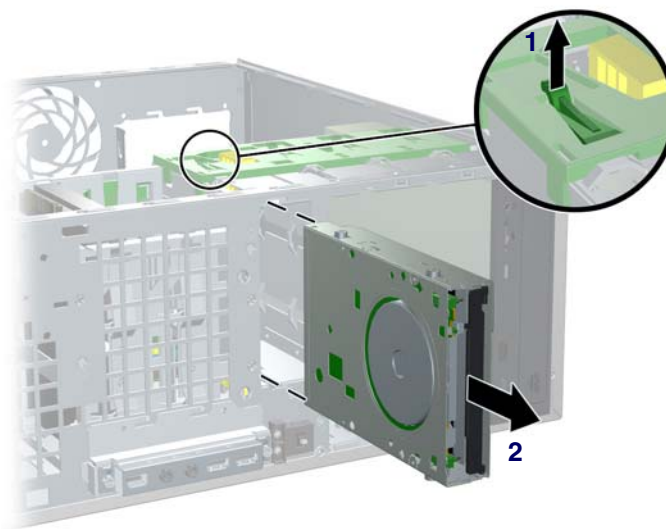
Diskette Drive (Optional)

To remove an optional diskette drive:

- 1 Disconnect power from the system ([page 73](#)), remove the access panel ([page 77](#)), and remove the front bezel ([page 80](#)).
- 2 Disconnect the cables from the back of the diskette drive.



- 3 After removing the front bezel and bezel blanks, lift the green drive lock release tab **1** and slide the drive **2** out at the same time.



To replace an optional diskette drive, reverse the previous steps. Align the screws with the slots on the drive, and slide the drive into the unit until it snaps into place.

Hard Drive

This section describes how to install SCSI and SATA hard drives.

- “SCSI” on page 107
- “SATA” on page 109

SCSI

For more information on SCSI hard drives, see “SCSI Devices” on page 153.

Before installing a SCSI hard drive on your workstation, you must give the hard drive a unique SCSI ID.

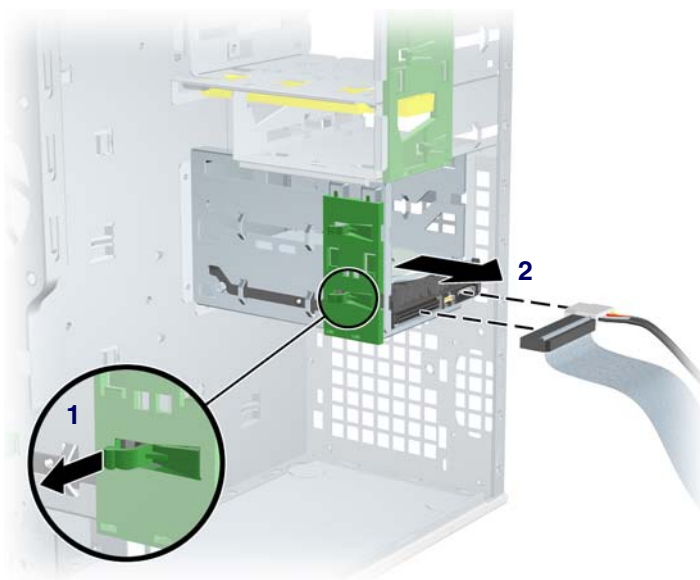
All SCSI controllers require a unique SCSI ID (0–15) for each SCSI device installed. The controller identifies a SCSI device by its SCSI ID number rather than its location. Moving a SCSI device from one position to another on the SCSI chain does not affect communication between the controller and the device. The reserved and available SCSI ID numbers for SCSI devices are as follows:

- 0 is reserved for the primary hard drive (not reserved for the primary hard drive on Linux).
- 7 is reserved for the SCSI controller.
- 1 through 6 and 8 through 15 are available for all other SCSI devices.

Once you have given the hard drive a unique SCSI ID, you can install the hard drive into your workstation.

To remove a SCSI hard drive:

- 1 Disconnect power from the system (page 73), remove the access panel (page 77), and lay the workstation on its side with the system board facing up.
- 2 Disconnect the cables from the back of the hard drive.
- 3 Lift up on the green drivelock release tab **1** and slide the hard drive **2** out of the chassis at the same time.



To install a hard drive, reverse the previous steps, but verify that the jumper settings are set as shown in the following illustration.

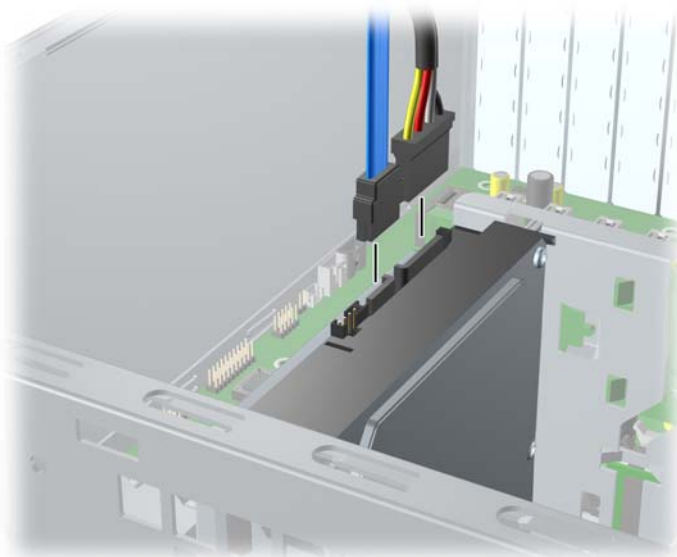


SATA

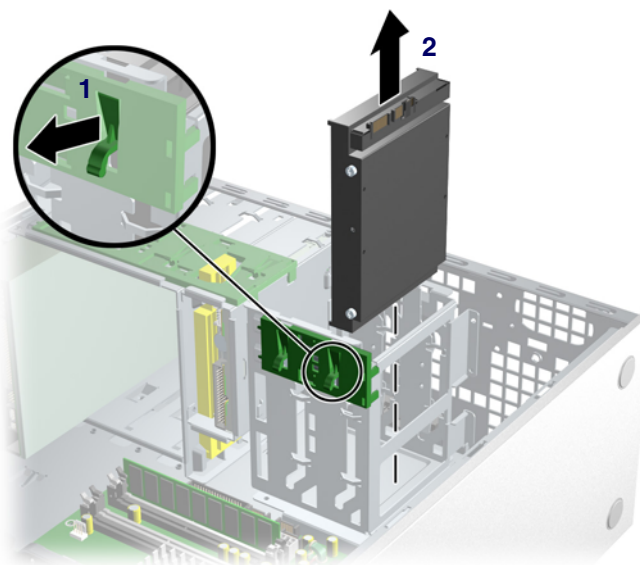
For more information on SATA hard drives and the SATA RAID configuration, see “SATA Devices” on [page 157](#).

To remove a SATA hard drive:

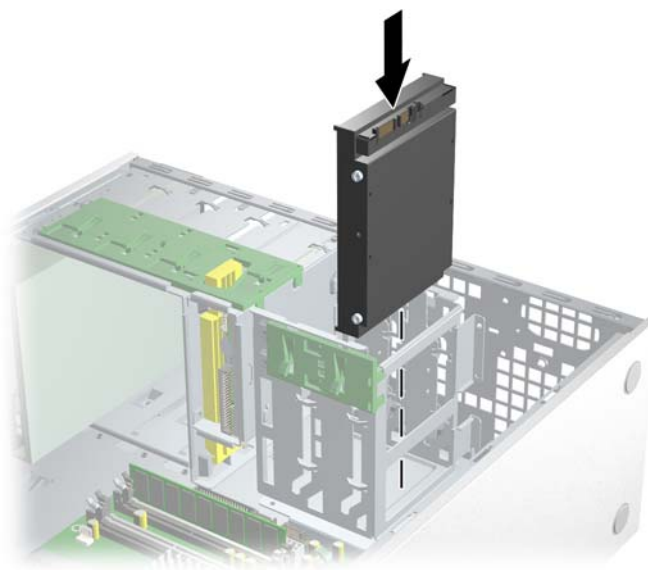
- 1 Disconnect power from the system ([page 73](#)), remove the access panel ([page 77](#)), and lay the workstation on its side with the system board facing up.
- 2 Remove the cables as shown in the following illustration.



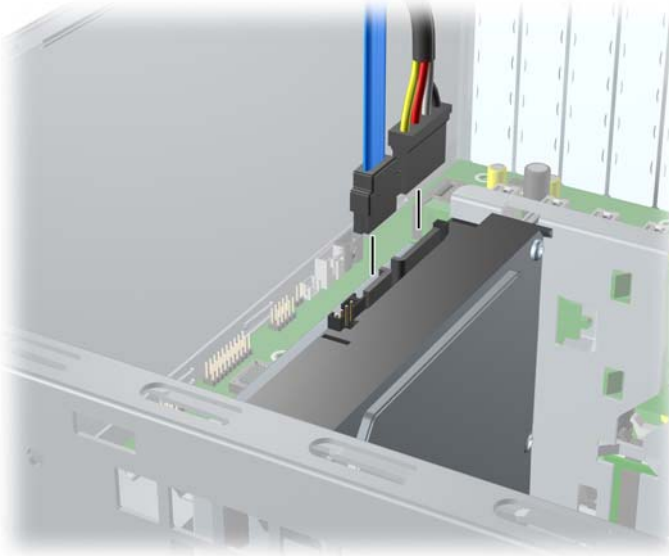
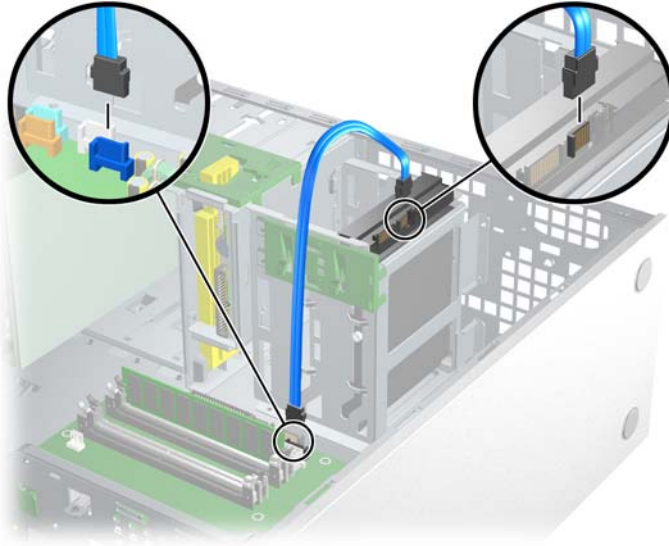
- 3 Pull the release latch **1** and remove the SATA drive **2** as shown in the following illustration.



- 4 Install the SATA drive as shown in the following illustration.



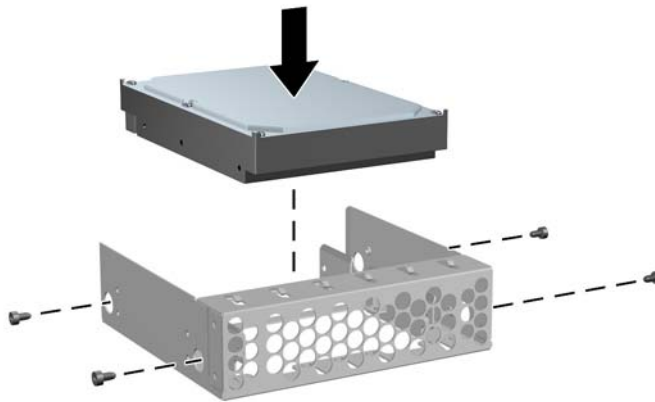
- 5 Connect the cables as shown in the following illustrations.



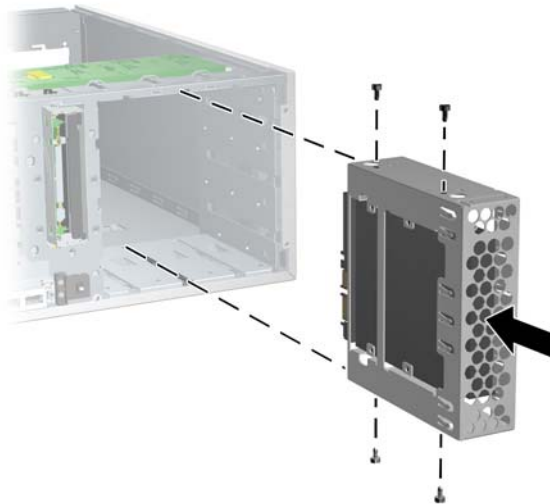
- 6 Close up the unit by reversing the procedures listed in step 1.

Installing Hard Drives in the 5.5" slot (Optional)

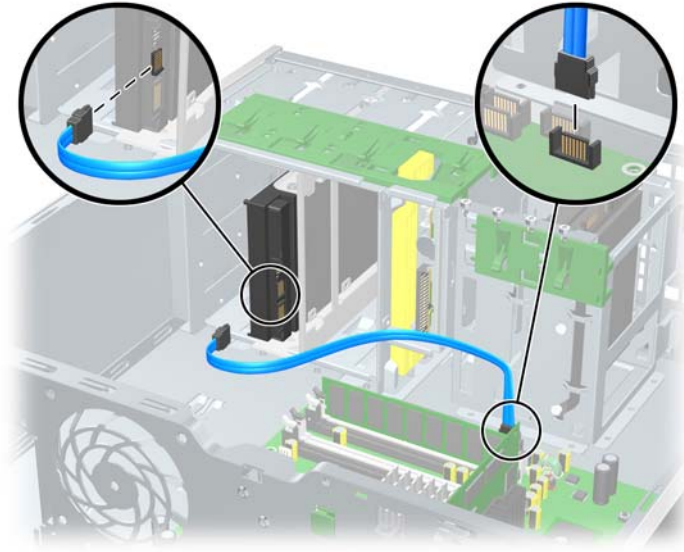
- 1 Place the hard drive in the bracket and secure with American National screws (page 70) as shown in the following illustration.



- 2 Remove the front bezel (page 80), then slide the bracket into the slot, and secure the drive to the chassis by tightening the four screws as shown in the following illustration.



3 Connect the cables as shown in the following illustration (SATA style drive shown).



System Board

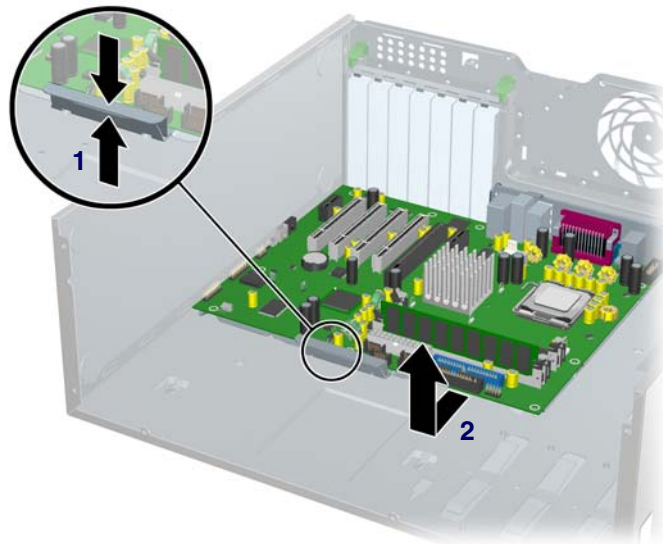
To remove the system board:

- 1 Disconnect power from the system (page 73), remove the access panel (page 77), lay the workstation on its side with the system board facing up, remove all expansion boards and graphics cards (page 97), and remove the processor heatsink (page 88).
- 2 Disconnect all cabling from the system board to disengage the plastic mounting standoffs from the chassis.



NOTE Make note of the cable connections before disconnecting them from the system board.

- 3 Press the release tab **1** as shown in the following illustration.
- 4 Slide the board **2** toward the front of the chassis and then lift it out of the unit.



To replace the system board:

- 1 Lay the system board back in the chassis slightly away from the rear of the chassis. The mounting hooks should fall into the recesses of the tray so the tray lays flat on the chassis base.
- 2 Slide the tray towards the rear of the chassis until the heat sink mounting holes line up.
- 3 Re-install the heatsink, cards, and cables.

Chapter 5 System Diagnostics and Troubleshooting

This chapter discusses the tools available for diagnosing and troubleshooting system issues. This chapter includes the following sections:

- “Help & Support Center (HSC) and E-Support” on page 116
- “Troubleshooting Checklist” on page 116
- “LED Color Definitions” on page 117
- “HP Insight Diagnostics Offline Edition” on page 117
- “Troubleshooting Using HP Intelligent Manageability Features” on page 122
- “Diagnostic Error Codes” on page 123
- “Troubleshooting Scenarios and Solutions” on page 125
- “POST and Error Messages” on page 148

Help & Support Center (HSC) and E-Support

HSC provides online access to technical support information, software updates and downloads, diagnostic tools, and HP support contact information.

To open HSC from your desktop, click **Start>Help and Support**.

HSC contains four sections:

- HP Product Information (requires Internet access)—Links to the HP Technical Support Web site for your product. You can access all related documentation, downloads and updates, tools, and more.
- HP Software & Driver Downloads (requires Internet access)—Links to HP-specific software downloads and updates.
- HP Support Tools (requires Internet access)—Links to self-help tools and diagnostics offered by HP Instant Support Professional Edition.
- Contact HP for Support (option available that does not require Internet access)—Provides two different options:
 - Chat with an expert online (requires Internet access)—Provides a tool to communicate with a support specialist online through **Active Chat**.
 - Call a support agent—Provides hardware details about the workstation and HP support contact phone number worldwide.

Troubleshooting Checklist

Before running any of the diagnostic utilities, review the following checklist to find possible solutions for workstation or software problems:

- Are the workstation and monitor connected to a working electrical outlet?
- Is the workstation turned on?
- Is the green power light illuminated?
- Is the monitor turned on?
- Is the green monitor light illuminated?
- Turn up the monitor brightness and contrast controls if the monitor is dim.
- Press and hold any key. If the system beeps, then the keyboard is operating correctly.
- Check all cables for loose or incorrect connections.
- Reconfigure the workstation after installing a non-Plug 'n Play expansion board or other option, such as a diskette drive.
- Are all of the necessary device drivers installed?
- Have all printer drivers been installed for each application?
- Remove all diskettes and CDs from the drives before you turn on the system.
- Are all switches set correctly?
- Are you running the latest BIOS version, drivers, and/or software updates?

LED Color Definitions

An LED light exists on the front panel of your workstation. The following table describes what each color signifies.

Table 5-1 LED color definitions

LED State	LED Color	System Status
Solid	Green	System is on.
Blinking	Green	System is in Standby.
Solid or Blinking	Red	System has error. See “Diagnostic Error Codes” on page 123
None	No Light	System is in Hibernate or it is off.

HP Insight Diagnostics Offline Edition

The diagnostics utility enables you to perform testing and to view critical computer hardware and software configuration information from various sources. This utility allows you to:

- Run diagnostics.
- View the hardware configuration of the system.

Key Features and Benefits

HP Insight Diagnostics simplifies the process of effectively identifying, diagnosing, and isolating the hardware issues.

In addition to robust management tools, service tools can be invaluable in quickly resolving system problems. To streamline the service process and resolve problems quickly, it is necessary to have the right information available at the time that a service call is placed. The primary information requirement, which is also the one that provides the greatest insight into potential system issues, is the configuration of the system. Insight Diagnostics helps provide higher system availability. Typical uses of the Insight Diagnostics are:

- Testing and diagnosing apparent hardware failures
- Documenting system configurations for upgrade planning, standardization, inventory tracking, disaster recovery, and maintenance
- Sending configuration information to another location for more in-depth analysis

Theory of Operation

Insight Diagnostics Offline Edition operates in offline mode only. The operating system is not running and software information from the system is not available to the diagnostics.

Offline Survey is available to display the current system configuration.

The **Insight Diagnostics Test** feature provides the capability to test functionality of all the major hardware components in the system. The Test feature is designed to be flexible to allow the user to customize test selections by providing different modes and types of testing.

A **Quick Test** provides a predetermined script where a sample of each hardware component is exercised and requires no user intervention.

A **Complete Test** provides a predetermined script where each hardware component is fully tested. You can select Interactive or Unattended tests. This will change the devices tested during the Complete Test. There are more tests available in the interactive mode, but these require user intervention.

A **Custom Test** provides the most flexibility in controlling the testing of a system. The Custom Test mode allows the user to specifically select which devices, tests, and test parameters are run. Users are provided the ability to select tests that do not require any user interaction through the Interactive and Unattended tests modes.

Diagnostic Utility on CD

HP Insight Diagnostics is available on the *Documentation Library* CD that was shipped with your workstation.

To start the diagnostic utility on the *Documentation Library* CD:

- 1 Turn on your workstation and press the **F10** key during the initial boot process to enter the Computer Setup (F10) Utility (page 36).
- 2 Select your language from the list and press the **Enter** key. In the Computer Setup Utilities menu, there are five headings displayed: File, Storage, Security, Power, and Advanced.
- 3 Use the right arrow key to select **Storage**. Use the down arrow key to select **Boot Order**, then press **Enter**.
- 4 Select **CD-ROM Drive** and enable it as a bootable device by pressing the **F5** key (if not already enabled, pressing F5 key again disables the device).
- 5 Set the **CD-ROM Drive** to the top of the boot order. To do this, select **CD-ROM**, press **Enter**, and use the up arrow to move it to top of order.
- 6 To apply and save changes, press the **F10** key, then select **File>Save Changes and Exit**.
- 7 Insert the *Documentation Library* CD into the workstation.
- 8 Restart your system and HP Insight Diagnostics launches automatically.

Download the ISO Image

The download the latest diagnostic utility.

- 1 Visit <http://www.hp.com>.
- 2 Click the **Support & Drivers** link.
- 3 Click the **Download** driver and software radio button.
- 4 Enter your product number (for example, xw4200) in the text box and press **Enter**.
- 5 Select your OS.
- 6 Click the **Diagnostic** link.
- 7 Locate **HP Insight Diagnostics** and click **Download**.

User Interface

NAVIGATION

The Insight Diagnostics home page contains the following tabs: **Survey**, **Test**, **Status**, **Log**, and **Help**. These tabs separate the major functions of Insight Diagnostics.

SURVEY TAB

When the Survey tab is selected, the **Survey** menu displays and allows you to view important system configuration information. The **Summary** view limits the amount of data displayed, while the **Advanced** view shows all the data in the selected category. Regardless of whether you choose **Advanced** or **Summary**, the following categories of information are available on the **Survey** menu:

- **Overview**—The Overview view gives you a listing of general information about the computer.
- **All**—The All view gives a listing of all information about the computer.
- **Architecture**—The Architecture view shows the type of bus the computer uses. In addition, if the bus is PCI, information about the PCI configuration is displayed.
- **Asset Control**—The Asset Control view shows the serial number of the computer (system identification number).
- **Communication**—The Communication view shows information about the computer parallel (LPT) and serial (COM) port settings, USB, and network controller information.
- **Graphics**—The Graphics view shows information about the graphics subsystem of the computer. This includes information about the graphics card, mode, and ROM.
- **Input Devices**—The Input Devices view shows information about the type of keyboard, mouse, and other input devices connected to the computer.
- **Internal Conditions**—The Internal Conditions view shows information about the health of the computer. This includes fan, temperature, and power supply information.
- **Memory**—The Memory view shows information about all memory in the computer. This includes memory on the board and any memory modules installed.
- **Miscellaneous**—The Miscellaneous view shows information obtained from the computers configuration memory (CMOS), BIOS data area, Interrupt Vector table, and diagnostics component information.
- **Multimedia**—The Multimedia view shows information about all multimedia devices in the workstation. This includes audio devices installed.
- **Resources**—The Resources view shows the system device resource usage information. This includes information about I/O, memory, IRQ, slot, and bus usage.
- **Storage**—The Storage view shows information about storage media connected to the computer. This list includes all fixed disks, diskette drives, and CD-ROM drives.
- **System**—The System view shows product type, processor type and speed, and coprocessor information. Also shown in this display is information about all ROMs in the computer.

TEST TAB

The Insight Diagnostics utility provides the capability to test all the major pieces of hardware in the system. You can select from several types of tests:

- **Quick Test**—Provides a predetermined script where a sample of each hardware component is exercised and requires no user intervention.
- **Complete Test**—Provides a predetermined script where each hardware component is fully tested. You can select **Interactive** or **Unattended** tests. This will change the devices tested during the Complete Test. There are more tests available in the interactive mode, but these require user intervention.
- **Custom Test**—Provides the most flexibility in controlling the testing of a system. The Custom Test mode enables the user to specifically select which devices, tests, and test parameters are run. Users are provided the ability to select tests that do not require any user interaction through the **Interactive** and **Unattended** test modes.

To begin testing:

- 1 Select the **Test** tab.
- 2 Select the **Type of Test** to perform and then select the **Test Mode**, either **Interactive** or **Unattended**.
- 3 Choose how you want the test to be executed, either **Number of Loops** or **Total Test Time**.

When choosing to run the test over a specified number of loops, enter the number of loops to perform. If you desire to have the diagnostic test for a specified time period, enter the amount of time in minutes.



NOTE Testing will automatically stop, if one test loop has been completed, when the elapsed test time has reached the specified time limit.

- 4 Click **Begin Testing** to start the test.

While tests are being performed, the user can monitor the progress by viewing the Status tab. Any errors that are detected are summarized in the Error Log. Click the Print button to print or save the report.

If the diagnostics utility detects an error during a test, the user can mouse-over the failed text in the Status tab to display additional information for the type of error and the error code.

To view all test failure information, select the Error Log. To view the status of all testing that has been performed, select the Log tab.

STATUS TAB

The Status tab displays the status of the selected tests. The type of test executed (for example, **Quick**, **Complete**, **Custom**) is displayed. The main progress bar displays the percent complete of the current set of tests. While testing is in progress a **Cancel** testing button, which will cancel the test job, is displayed.

After testing has completed the **Cancel** testing button is replaced with two buttons, **Select New Tests** and **Retest**. The **Select New Tests** button allows you to go back to the previous test selection page to select a new set of tests. The **Retest** button will retest the last set of tests executed. This enables you to re-run the set of tests without having to go back to the test selection page.

The Status page also shows:

- The devices being tested.
- The tests that are running.
- The overall elapsed time.
- The individual elapsed test times.
- The condition status of each test.

LOG TAB

The Log tab consists of three views.

- **Test Log**—Displays all tests that have been executed, number of times of execution, number of times the test failed, and the time it took to complete the test. The Clear Test Log button will clear the contents of the Test Log.
- **Error Log**—Displays the tests that have failed during the diagnostic testing. Besides displaying the device and test this section might also include error details. The description section describes the error that the diagnostic test found. The Recommended Repair will give a recommended action that should be performed to resolve the failed hardware. The error count is the number of times the test has failed. The Clear Error Log button will clear the contents of the Error Log.
- **Test Components**—Hardware and software tests can be performed on the following components:
 - **Audio**—Identifies all audio devices installed in a system, captures any associated configuration information, and provides the ability to verify proper operation of these devices.
 - **CPU**—Identifies all processors installed in a system, captures any associated configuration information, and provides the ability to verify proper operation of these devices.
 - **Inspect**—Captures general system configuration information.
 - **Keyboard**—Identifies the keyboard installed in a system and provides the ability to verify proper operation of this device.
 - **Memory**—Identifies all memory modules installed in a system, captures any associated configuration information, and provides the ability to verify proper operation of these modules.
 - **Modem**—Identifies all modem devices installed in a system, captures any associated configuration information, and provides the ability to verify the proper operation of these devices.
 - **Mouse**—Identifies the mouse installed in a system and provides the ability to verify proper operation of this device.

- **Network**—Identifies all network devices installed in a system, captures any associated configuration information, and provides the ability to verify proper operation of these devices. NIC testing is only performed if drivers are installed during discovery.
- **Parallel Port**—Identifies all parallel devices installed in a system and captures any associated configuration information. If the parallel port is properly configured and the information is available to the operating system, the associated DMA, IRQ, and I/O ports are reported. This test component also provides the ability to verify proper operation of these devices.
- **PCI Bus**—Identifies all PCI devices installed in a system and provides the ability to verify proper PCI I/O operation to the devices.
- **Serial Port**—Identifies all serial devices installed in a system, captures any associated configuration information, and provides the ability to verify proper operation of these devices.
- **Storage**—Identifies storage devices connected to a system through IDE, USB, SCSI or a Fibre Channel network. Supported devices include:
 - IDE hard disk drives
 - USB diskette drives
 - SCSI disk drives
 - SCSI tape drives
 - SCSI controllers
 - RAID controllers

Controllers can be connected to the host through PCI, I2C, or serial port. The component also captures any associated configuration information, and provides the ability to verify proper operation of these devices.

- **Stress**—Provides a solution for stress testing hardware in a system.
- **USB**—Identifies all USB devices installed in a system, captures any associated configuration information, and provides the ability to verify proper operation of these devices.
- **Graphics**—Identifies all graphic devices installed in a system, captures any associated configuration information, such as the ASIC and monitor types, and provides the ability to verify proper operation of these devices.

A list of available tests for each test component and a list of error codes can be accessed through the Test Component and Error Codes menu selections on the Help tab menu bar.

Troubleshooting Using HP Intelligent Manageability Features

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

Diagnostic Error Codes

This section gives an overview of the diagnostic lights and error codes that are related to the HP Workstation xw4200.

Diagnostic Light Codes

Table 5-2 Diagnostic Light Codes

Chassis Indicator Lights	
Power LED and Sound Activity	Diagnosis and Service Action
None	<p>System does not power on Press power button. If HDD LED = GREEN, then:</p> <ol style="list-style-type: none">1 Remove expansion cards one at a time until the 5V_Aux light on the system board illuminates.2 Replace system board. <p>OR</p> <ol style="list-style-type: none">1 Press power button. If HDD LED does not illuminate, then:2 Verify workstation plugged into live AC outlet.3 Verify power button harness connected to system board.4 Verify that both power supply cables are properly connected to the system board.5 Verify that the 5V_Aux light on the system board is illuminated. If on, replace the power button harness.6 Disconnect the AC power cord. Disconnect all internal power supply cables. Plug in the AC power cord. On the rear panel of the workstation, look through the ventilation holes above the power cord connector for a green LED light.<ul style="list-style-type: none">● If the green LED light is not visible or the power supply fan is not spinning, replace the power supply.● If the green LED light is visible and the power supply fan is spinning, the power supply is functional.7 Replace system board.
Blinks RED 2 times, once per second, then 2 second pause, 2 beeps	<p>Thermal Shutdown:</p> <ol style="list-style-type: none">1 Ensure the workstation air vents are not blocked and cooling fan is running.2 Open hood, press power button, and see if processor fan spins. If not spinning, ensure fan cable is plugged into the system board. Ensure fan is fully/properly seated.3 If fan is plugged in and seated but not spinning, then replace processor fan.4 Reseat CPU heatsink and verify fan assembly properly attached.
Blinks RED 3 times, once per second, then 2-second pause, 3 beeps	<p>CPU not installed:</p> <ol style="list-style-type: none">1 Install CPU.2 Reseat CPU.

Table 5-2 Diagnostic Light Codes (Continued)

Chassis Indicator Lights (Continued)	
Power LED and Sound Activity	Diagnosis and Service Action
Blinks RED 4 times, once per second, then 2 second pause, 4 beeps	Power supply failure: <ol style="list-style-type: none">1 Open the access panel and ensure the 4-wire power supply cable is properly connected to the system board.2 Locate faulty device by removing all devices and then reinstalling one at a time until workstation fails. Replace the device causing the failure. Continue adding devices to ensure all are functioning properly.3 Replace the power supply.4 Replace the system board.
Blinks RED 5 times, once per second, then 2 second pause, 5 beeps	Pre-video memory error. <ol style="list-style-type: none">1 Reseat memory modules.2 Replace memory modules one at a time to find the faulty module.3 Replace third-party modules with HP memory.4 Replace system board.
Blinks RED 6 times, once per second, then 2 second pause, 6 beeps	Pre-video graphics card error. For systems with integrated graphics, replace system board. For systems with graphic cards, <ol style="list-style-type: none">1 Reseat the graphics card. Power on the system.2 Replace the graphics card.3 Replace the system board.
Blinks RED 7 times, once per second, then 2 second pause, 7 beeps.	System board failure (ROM detected failure before video). Replace system board.
Blinks RED 8 times, once per second, then 2 second pause, 8 beeps	Invalid ROM based on bad checksum. <ol style="list-style-type: none">1 Reflash ROM.2 Replace system board.
Blinks RED 9 times, once per second, then 2 second pause, 9 beeps	System powers on but is unable to boot. <ol style="list-style-type: none">1 Replace the system board.2 Replace the processor.

Troubleshooting Scenarios and Solutions

This section presents an extensive overview of various troubleshooting scenarios and includes possible solutions for each. Before replacing the power supply, use the Built-In Self-Test (BIST) feature to learn if the power supply still works.

To test the power supply:

- 1 Disconnect all internal power supply cables.
- 2 On the rear panel of the workstation, look through the ventilation holes above the power cord connector for a green LED light. If the light is visible, the power supply is functional.

Solving Minor Problems

Table 5-3 Solving Minor Problems

Problem	Cause	Possible Solution
Workstation appears locked up and will not turn off when the power button is pressed.	Software control of the power switch is not functional.	<ol style="list-style-type: none">1 Press and hold the power button for at least four seconds until the workstation turns off.2 Disconnect electrical plug from outlet.
Workstation will not respond to USB keyboard or mouse.	Workstation is in standby mode.	Press the power button to resume from standby mode.
NOTE: When attempting to resume from standby mode, do not hold down the power button for more than four seconds. Otherwise, the workstation will shut down and you will lose your data.		
Workstation date and time display is incorrect.	Real-time clock (RTC) battery may need to be replaced.	<ol style="list-style-type: none">1 Reset the date and time under Control Panel.2 Replace the RTC battery.
Workstation appears to pause periodically.	Network driver is loaded and no network connection is established.	Establish a network connection, or use Computer Setup or Microsoft Windows Device Manager to disable the network controller.
Cursor will not move using the arrow keys on the keypad.	The Num Lock key might be on.	Press the Num Lock key. The Num Lock key can be disabled (or enabled) in Computer Setup.
Cannot remove access panel.	Solenoid hood lock, featured on some workstations, is locked.	<ol style="list-style-type: none">1 Unlock the solenoid hood lock using Computer Setup.2 Use the access panel FailSafe Key in case of forgotten password, power loss, or workstation malfunction.
Poor performance is experienced.	Processor is hot.	<ol style="list-style-type: none">1 Ensure airflow to the workstation is not blocked.2 Ensure the fans are connected and working properly (some fans only operate when needed).3 Ensure the processor heatsink is installed properly.
	Hard drive is full.	Transfer data from the hard drive to create more space on the hard drive.

Table 5-3 Solving Minor Problems (Continued)

Problem	Cause	Possible Solution
Workstation powered off automatically and the Power LED flashes Red two times, once every second, followed by a two-second pause.	Processor thermal protection activated: A fan might be blocked or not turning. OR The heatsink is not properly attached to the processor.	<ol style="list-style-type: none"> 1 Ensure workstation air vents are not blocked and the cooling fan is running. 2 Open hood, press power button, and see if the processor fan spins. If not spinning, be sure the fan's cable is plugged onto the system board header. Ensure the fan is fully/properly seated or installed. 3 Replace the processor fan. 4 Reseat processor heatsink and verify that the fan assembly is properly attached.
System does not power on and the LEDs on the front of the workstation are not flashing.	System unable to power on.	<p>Press and hold the power button for less than 4 seconds. If the hard drive LED turns green, then:</p> <ol style="list-style-type: none"> 1 Remove the expansion cards one at a time until the 5V_aux light on the system board turns on. 2 Replace the system board. <p>OR</p> <p>Press and hold the power button for less than 4 seconds. If the hard drive LED does not turn on green then:</p> <ol style="list-style-type: none"> 1 Check that the unit is plugged into a working AC outlet. 2 Open hood and check that the power button harness is properly connected to the system board. 3 Check that both power supply cables are properly connected to the system board. 4 If the 5V_aux light on the system board is on, then replace the power button harness. 5 If the 5V_aux light on the system board is off, perform the Built-In Self-Test on the power supply. Disconnect the AC power cord from the system. Disconnect all internal power supply cables. Plug in AC power. <ul style="list-style-type: none"> ■ If the green BIST LED on the rear of the workstation is lit AND the fan is spinning, the power supply is functional. ■ If the green BIST LED is not lit OR the fan is not spinning, replace the power supply. 6 Replace the system board.

Solving Power Supply Problems

Before replacing the power supply, use the Built-In Self-Test (BIST) feature to learn if the power supply still works.

To test the power supply:

- 1 Disconnect the AC power cord from the workstation.
- 2 Disconnect all internal power supply cables.
- 3 Plug in the AC power cord.
 - If the green BIST LED **1** on the rear of the workstation is lit AND the fan is spinning, the power supply is functional.
 - If the green BIST LED is not lit OR the fan is not spinning, replace the power supply.



Table 5-4 Solving Power Supply Problems

Problem	Cause	Solution
Power supply shuts down intermittently.	Power supply fault.	Replace the power supply.
Workstation powered off automatically and the Power LED flashes Red two times, once every second, followed by a two-second pause.	Processor thermal protection activated: A fan might be blocked or not turning. OR The heatsink/fan assembly is not properly attached to the processor.	<ol style="list-style-type: none"> 1 Ensure that the workstation air vents are not blocked and the cooling fan is running. 2 Open hood, press the power button, and see if the processor fan spins. If the processor fan is not spinning, make sure the fan's cable is plugged onto the system board header. Ensure the fan is fully/properly seated or installed. 3 Replace the processor fan. 4 Reseat processor heatsink and verify that the fan assembly is properly attached.

Table 5-4 Solving Power Supply Problems (Continued)

Problem	Cause	Solution
Power LED flashes Red, once every two seconds.	Power failure (power supply is overloaded).	<ol style="list-style-type: none">1 Open the hood and ensure the 4-wire power supply cable is seated into the connector on the system board.2 Check if a device is causing the problem by removing ALL attached devices). Power on the system. If the system enters the POST, then power off and replace one device at a time and repeat this procedure until failure occurs. Replace the device causing the failure. Continue adding devices one at a time to ensure all devices are functioning properly.3 Perform BIST on power supply. If power supply fan does NOT spin or the green BIST LED does NOT light, replace the power supply.4 Replace system board.

Solving Diskette Problems

Table 5-5 Solving Diskette Problems

Problem	Cause	Solution
Diskette drive light stays on.	Diskette is damaged.	In Microsoft Windows 2000 and Microsoft Windows XP, right-click Start, click Explore, and select a drive. Select File>Properties>Tools . Under Error-checking, click Check Now.
	Diskette is incorrectly inserted.	Remove diskette and reinsert.
	Drive button is not pushed in.	Push in drive button.
	Files on diskette are damaged.	Check the program diskettes.
	Drive cable is not properly connected.	Reconnect power cable. Ensure that all four pins are connected.
Drive not found.	Cable is loose.	Reseat diskette drive data and power cables.
	Removable drive is not seated properly.	Reseat the drive.
Diskette drive cannot write to a diskette.	Diskette is not formatted.	Format the diskette.
	Diskette is write-protected.	Use another diskette or remove the write protection.
	Writing to the wrong drive.	Check the drive letter in the path statement.
	Not enough space is left on the diskette.	Use another diskette.
	Diskette write control is enabled.	Use Computer Setup to check the storage security feature disabled settings.
	Diskette is damaged.	Replace the damaged disk.

Table 5-5 Solving Diskette Problems (Continued)

Problem	Cause	Solution
Cannot format diskette.	Invalid media reported.	When formatting a disk in MS-DOS, you might need to specify diskette capacity. For example, to format a 1.44-MB diskette, enter the following command at the MS-DOS prompt: FORMAT A: /F:1440
A problem has occurred with a disk transaction.	The directory structure is bad, or there is a problem with a file.	In Windows 2000 and Windows XP, right-click Start, click Explore, and select a drive. Select File>Properties>Tools . Under Error-checking, click Check Now.
Diskette drive cannot read a diskette.	Diskette is not formatted.	Format the diskette.
	You are using the wrong diskette type for the drive type.	Check the type of drive that you are using and use the correct diskette type.
	You are reading the wrong drive.	Check the drive letter in the path statement.
	Diskette is damaged.	Replace the diskette with a new one.
"Invalid system disk" message is displayed.	A diskette that does not contain the system files needed to start the workstation has been inserted in the drive.	When drive activity stops, remove the diskette and press the Spacebar . The workstation should start up.
	Diskette error has occurred.	Restart the workstation by pressing the power button.
Cannot boot to diskette.	Diskette is not bootable.	Replace with a bootable diskette.
	Diskette boot has been disabled in Computer Setup.	Run Computer Setup and enable diskette boot in Storage>Boot Order .
	Removable media boot has been disabled in Computer Setup.	Run Computer Setup and enable Removable Media Boot in Storage>Storage Options .
	Diskette MBR validation is enabled.	Run Computer Setup and disable Diskette MBR Validation in Storage>Storage Options .

Solving Hard Drive Problems

Table 5-6 Solving Hard Drive Problems

Problem	Cause	Solution
Hard drive error occurs.	Hard disk has bad sectors or has failed.	Use a utility to locate and block usage of bad sectors. If necessary, reformat the hard disk.
Disk transaction problem.	Either the directory structure is bad or there is a problem with a file.	In Windows 2000 and Windows XP, right-click Start, click Explore, and select a drive. Select File>Properties>Tools . Under Error-checking, click Check Now.
Drive not found (identified).	Loose cable.	Check cable connections.
	The system might not have automatically recognized a newly installed device.	<ol style="list-style-type: none"> 1 Run Computer Setup. 2 If the system still does not recognize the new device, check to see if the device is listed within Computer Setup. If it is listed, the probable cause is a driver problem. If it is not listed, the probable cause is a hardware problem. 3 If this is a newly installed drive, enter Setup and try adding a POST delay under Advanced>Power-On.
	Drive jumper settings might be incorrect.	If the drive is a secondary drive that has just been installed on the same cable as the primary drive, verify that the jumpers for both drives are set correctly.
	Drive's IDE (ATA) controller is disabled in Computer Setup.	Run Computer Setup and enable the IDE controller in Storage>Storage Options .
	Drive responds slowly immediately after power-up.	Run Computer Setup and increase the POST Delay in Advanced>Power-On Options .
Nonsystem disk/NTLDR missing message.	System is trying to start from a non-bootable diskette.	Remove the diskette from the diskette drive.
	System is trying to start from a damaged hard drive.	<ol style="list-style-type: none"> 1 Insert a bootable diskette into the diskette drive and restart the workstation. 2 If the hard drive is still inaccessible and MBR Security is enabled, try restoring the previously saved MBR image by entering Setup and selecting Security>Restore Master Boot Record.
	System files missing or not properly installed.	<ol style="list-style-type: none"> 1 Insert a bootable system diskette and restart. 2 Verify hard drive is partitioned and formatted. 3 Install system files for the appropriate operating system if necessary.
	Hard drive boot disabled in Computer Setup.	Run Computer Setup and enable the hard drive entry in the Storage>Boot Order list.
Second UATA hard drive does not perform optimally.	Using the wrong cable for the drive type.	Reinstall the second UATA hard drive using an 80-conductor cable (standard on select models).

Table 5-6 Solving Hard Drive Problems (Continued)

Problem	Cause	Solution
Workstation will not start.	Hard drive is damaged.	Observe the beeps and LED lights on the front of the workstation. See the “POST and Error Messages” on page 148.
Workstation seems to be locked up.	Program in use has stopped responding to commands.	<ol style="list-style-type: none"> 1 Attempt the normal Windows “Shut Down” procedure. 2 Press the power button for four or more seconds to turn off the power. 3 Restart the workstation using the power button.

Solving Display Problems

Table 5-7 Solving Display Problems

Problem	Cause	Solution
Blank screen (no video).	The cable connections are not correct.	Check the cable connections from the monitor to the workstation and to the electrical outlet.
	Screen blanking utility installed or energy saver features enabled.	Press any key or click the mouse button and, if set, enter your password.
	System ROM is bad; system is running in FailSafe Boot Block mode (indicated by eight beeps).	Reflash the ROM using a ROMPaq diskette.
	Fixed-sync monitor will not sync at the resolution chosen.	Ensure that the monitor can accept the same horizontal scan rate as the resolution chosen.
	Computer is in standby mode.	Press the power button to resume from standby mode.

CAUTION: When attempting to resume from standby mode, do not hold down the power button for more than four seconds. Otherwise, the workstation will shut down and you will lose your data.

Monitor cable plugged into the wrong connector.	If the workstation system has both an integrated graphics connector and a PCI expansion card connector, plug the monitor cable into the PCI expansion card connector.
Monitor settings in the workstation are not compatible with the monitor.	<ol style="list-style-type: none"> 1 Restart the workstation and press F8 during startup when you see “Press F8” in the bottom right corner of the screen. 2 Using the keyboard arrow keys, select Enable VGA Mode and press Enter. 3 In Windows Control Panel, double-click the Display icon and select the Settings tab. 4 Use the sliding control to reset the resolution.

Table 5-7 Solving Display Problems (Continued)

Problem	Cause	Solution
Power LED flashes Red six times, once every second, followed by a two-second pause, and the workstation beeps six times.	Pre-video graphics error.	For systems with a graphics card: <ol style="list-style-type: none"> 1 Reseat the graphics card. 2 Replace the graphics card. 3 Replace the system board. 4 For systems with integrated graphics, replace the system board.
Monitor does not function properly when used with energy saver features.	Monitor without energy saver capabilities is being used with energy saver features enabled.	Disable monitor energy saver feature.
Dim characters.	The brightness and contrast controls are not set properly.	Adjust the monitor brightness and contrast controls.
	Cables are not properly connected.	Check that the graphics cable is securely connected to the graphics card and the monitor.
Blurry video or requested resolution cannot be set.	If the graphics controller was upgraded, the correct video drivers might not be loaded.	Install the video drivers included in the upgrade kit.
	Monitor is not capable of displaying requested resolution.	Change requested resolution.
The picture is broken up, rolls, jitters, or flashes.	The monitor connections might be incomplete or the monitor might be incorrectly adjusted.	1 Be sure the monitor cable is securely connected to the workstation.
		2 In a two-monitor system or if another monitor is in close proximity, be sure the monitors are not interfering with each other's electromagnetic field by moving them apart.
	3 Fluorescent lights or fans might be too close to the monitor.	
	Monitor must be degaussed.	Degauss the monitor.
Vibrating or rattling noise coming from inside a CRT monitor when powered on.	Monitor degaussing coil has been activated.	None. It is normal for the degaussing coil to be activated when the monitor is powered on.
Clicking noise coming from inside a CRT monitor.	Electronic relays have been activated inside the monitor.	None. It is normal for some monitors to make a clicking noise when turned on and off, when going in and out of standby mode, and when changing resolutions.
High pitched noise coming from inside a flat panel monitor.	Brightness and/or contrast settings are too high.	Lower brightness and/or contrast settings.
Fuzzy focus; streaking, ghosting, or shadowing effects; horizontal scrolling lines; faint vertical bars; or unable to center the picture on the screen. (Flat panel monitors using an analog VGA input connection only.)	Flat panel monitor's internal digital conversion circuits might be unable to correctly interpret the output synchronization of the graphics card.	<ol style="list-style-type: none"> 1 Select the monitor's Auto-Adjustment option in the monitor's on-screen display menu. 2 Manually synchronize the Clock and Clock Phase on-screen display functions. Download SoftPaq SP20930 or SP22333, depending on the monitor, to assist with the synchronization.

Table 5-7 Solving Display Problems (Continued)

Problem	Cause	Solution
Certain typed symbols do not appear correct.	The font you are using does not support that particular symbol.	Use the Character Map to locate the and select the appropriate symbol. Click Start>All Programs>Accessories>System Tools>Character Map . You can copy the symbol from the Character Map into a document.

Solving Audio Problems

Table 5-8 Solving Audio Problems

Problem	Cause	Solution
Sound does not come out of the speaker or headphones.	Software volume control is turned down.	Double-click the Speaker icon on the taskbar and use the volume slider to adjust the volume.
	The external speakers are not turned on.	Turn on the external speakers.
	External speakers plugged into the wrong audio jack.	Refer to the sound card documentation for proper speaker connection.
	Audio cable not connected.	Connect audio cable between CD or DVD-ROM drive and the system board.
	Digital CD audio is not enabled.	Enable digital CD audio: <ol style="list-style-type: none"> 1 From the Control Panel, select System. 2 On the Hardware tab, click the Device Manager button. 3 Right-click on the CD/DVD device and select Properties. 4 On the Properties tab, be sure "Enable digital CD audio for this CD-ROM device" is checked.
Headphones or devices connected to the line-out connector mute the internal speaker.	Turn on and use headphones or external speakers, if connected, or disconnect headphones or external speakers.	
Volume is muted.		<ol style="list-style-type: none"> 1 From the Control Panel program, click Sound, Speech and Audio Devices, then click Sounds and Audio Devices. 2 Click the Mute checkbox to remove the check mark from the box.
		Computer is in standby mode.

CAUTION: When attempting to resume from standby mode, do not hold down the power button for more than four seconds. Otherwise, the workstation will shut down and you will lose your data.

Noise or no sound comes out of the speakers or headphones.	<ol style="list-style-type: none"> 1 If 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 or use the multimedia device properties to manually switch the audio signal from analog to digital. 2 If the headphones have a mono jack, use the multimedia device properties to switch the system to analog out.
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NOTE: If you set digital as the Output Mode, the internal speaker and external analog speakers will no longer output audio until you switch back to an auto-sense or analog mode.

If you set analog as the Output Mode, external digital speakers will not function until you change the output mode back to an auto-sense or digital mode.

Table 5-8 Solving Audio Problems (Continued)

Problem	Cause	Solution
Sound cuts in and out.	Processor resources are being used by other open applications.	Shut down all open processor-intensive applications.
Workstation appears to be locked up while recording audio.	The hard disk may be full.	<ol style="list-style-type: none"> 1 Before recording, be sure there is enough free space on the hard disk. 2 Try recording the audio file in a compressed format.

Solving Printer Problems

Table 5-9 Solving Printer Problems

Problem	Cause	Solution
Printer will not print.	Printer is not turned on and online.	Turn the printer on and be sure it is online.
	The correct printer driver for the application are not installed.	<ol style="list-style-type: none"> 1 Install the correct printer driver for the application. 2 Try printing using the MS-DOS command: DIR C:\>[printer port] where [printer port] is the address of the printer being used. If the printer works, reload the printer driver.
	If you are on a network, you might not have made the connection to the printer.	Make the proper network connections to the printer.
	Printer might have failed.	Run printer self-test.
Printer will not turn on.	The cables might not be connected properly.	Reconnect all cables.
Printer prints garbled information.	The correct printer driver is not installed.	Install the correct printer driver for the application.
	The cables might not be connected properly.	Reconnect all cables.
	Printer memory might be overloaded.	Reset the printer by turning it off for one minute, then turn it back on.
Printer is offline.	The printer might be out of paper.	<ol style="list-style-type: none"> 1 Check the paper tray and refill it if it is empty. 2 Select online.

Solving Keyboard and Mouse Problems

Table 5-10 Solving Keyboard Problems

Problem	Cause	Solution
Keyboard commands and typing are not recognized by the workstation.	Keyboard connector is not properly connected.	<ol style="list-style-type: none"> 1 Turn off the workstation. 2 Reconnect the keyboard to the back of the workstation and restart the workstation.
	Program in use has stopped responding to commands.	Shut down the workstation using the mouse and then restart the workstation.
	Keyboard needs repairs.	Replace the keyboard.
	Workstation is in standby mode.	Press the power button to resume from standby mode.
<p>NOTE: Some mouse software applications might interfere with the functionality of the keyboard and mouse if the keyboard and mouse are connected to your workstation through a keyboard, video, mouse (KVM) switch. If you are experiencing “no-response” from your keyboard and mouse, you might need to uninstall the mouse software or connect the keyboard and mouse directly to the keyboard and mouse connectors on the workstation.</p>		
<p>CAUTION: When attempting to resume from standby mode, do not hold down the power button for more than four seconds. Otherwise, the workstation will shut down and you will lose your data.</p>		
Cursor will not move using the arrow keys on the keypad.	The Num Lock key might be on.	Press the Num Lock key. The Num Lock light should not be on if you want to use the arrow keys. The Num Lock key can be disabled (or enabled) in Computer Setup.
Mouse does not respond to movement or is too slow.	Mouse connector is not properly plugged into the back of the workstation.	<ol style="list-style-type: none"> 1 Shut down the workstation using the keyboard. 2 Plug the mouse connector into the back of the workstation (or the keyboard) and restart the workstation.
	Program in use has stopped responding to commands.	Shut down the workstation using the keyboard and then restart the workstation.
	Mouse needs repairs.	Replace the mouse.
	Workstation is in standby mode.	Press the power button to resume from standby mode.
<p>CAUTION: When attempting to resume from standby mode, do not hold down the power button for more than four seconds. Otherwise, the workstation will shut down and you will lose your data.</p>		
Mouse will only move vertically or horizontally, or movement is jerky.	Mouse roller ball is dirty.	Remove roller ball cover from the bottom of the mouse and clean it.

Solving Front Panel Component Problems

If you are experiencing problems with one of the front panel ports, you might be able to try your device in the corresponding port on the back side of the computer. If this does not fix the problem, or you must use the front panel ports, continue troubleshooting.

Some problems in this section are also discussed in other troubleshooting suggestions in this chapter.

Table 5-11 Solving Front Panel Component Problems

Problem	Cause	Solution
If a USB device, headphone, or microphone is not recognized by the workstation.	It is not properly connected.	<ol style="list-style-type: none">1 Turn off the workstation.2 Reconnect the device to the front of the workstation and restart the workstation.
	The device does not have power.	If the USB device requires AC power, be sure one end is connected to the device and one end is connected to a live outlet.
	The correct device driver is not installed.	<ol style="list-style-type: none">1 Install the correct driver for the device.2 You might need to reboot the workstation.
	The cable from the device to the computer does not work.	<ol style="list-style-type: none">1 If possible, replace the cable.2 Restart the workstation.
	The device is not working.	<ol style="list-style-type: none">1 Replace the device.2 Restart the workstation.
A device in the IEEE-1394 port is not responsive.	Cable(s) of new external device are loose or power cables are unplugged.	Ensure that all cables are properly and securely connected.
	The power switch on the device is not turned on.	Turn off the workstation, turn on the external device, then turn on the workstation to integrate the device with the workstation system.
The IEEE-1394 port is not active.	The port is not there because it was not purchased with the system.	You can buy an IEEE1394 connection. Contact an HP seller.
	The IEEE-1394 cable might not be connected to the IEEE-1394 card.	<ol style="list-style-type: none">1 Turn off the workstation.2 Remove the access panel. See “Access Panel” on page 77 for more information.3 Be sure to connect the front IEEE-1394 pre-installed cable to the IEEE-1394 card. See “IEEE-1394 (Optional)” on page 82.

Solving Hardware Installation Problems

You might need to reconfigure the workstation when you add or remove hardware, such as an additional diskette drive. If you install a Plug 'n Play device, Windows 2000 and Windows XP automatically recognize the device and configure the workstation. If you install a non-Plug 'n Play device, you must reconfigure the workstation after completing installation of the new hardware. In Windows 2000, select the Add New Hardware icon in the Control Panel (for Windows XP, use the Add Hardware Wizard) and follow the instructions that appear on the screen.

Table 5-12 Solving Hardware Installation Problems

Problem	Cause	Solution
A new device is not recognized as part of the system.	Device is not seated or connected properly.	Ensure that the device is properly and securely connected and that pins in the connector are not bent down.
	Cables of new external device are loose or power cables are unplugged.	Ensure that all cables are properly and securely connected and that pins in the cable or connector are not bent down.
	Power switch of new external device is not turned on.	Turn off the workstation, turn on the external device, then turn on the workstation to integrate the device with the workstation system.
	When the system advised you of changes to the configuration, you did not accept them.	Reboot the workstation and follow the instructions for accepting the changes.
	A Plug 'n Play board might not automatically configure when added if the default configuration conflicts with other devices.	Use Windows 2000 or Windows XP Device Manager to deselect the automatic settings for the board and choose a basic configuration that does not cause a resource conflict. You can also use Computer Setup to reconfigure or disable devices to resolve the resource conflict.
Workstation will not start.	Wrong memory modules were used in the upgrade or memory modules were installed in the wrong location.	1 Review the documentation that came with the system to determine if you are using the correct memory modules and to verify the proper installation.
		2 Observe the beeps and LED lights on the front of the workstation. See the “POST and Error Messages” on page 148 to determine possible causes.
Power LED flashes Red five times, once every second, followed by a two-second pause, and the workstation beeps five times.	Memory is installed incorrectly or is bad.	1 Reseat DIMMs.
		2 Replace DIMMs one at a time to isolate the faulty module.
		3 Replace third-party memory with HP memory.
		4 Replace the system board.

Table 5-12 Solving Hardware Installation Problems (Continued)

Problem	Cause	Solution
Power LED flashes Red six times, once every second, followed by a two-second pause, and the workstation beeps six times.	Video card is not seated properly or is bad, or system board is bad.	For systems with a graphics card: <ol style="list-style-type: none">1 Reseat the graphics card. Power on the system.2 Replace the graphics card.3 Replace the system board.4 For systems with integrated graphics, replace the system board.

Solving Network Problems

These guidelines do not discuss the process of debugging the network cabling.

Table 5-13 Solving Network Problems

Problem	Cause	Solution
Wake-on-LAN feature is not functioning.	Wake-on-LAN is not enabled.	Use the Network control application to enable Wake-on-LAN.
Network driver does not detect network controller.	Network controller is disabled.	Run Computer Setup and enable network controller.
	Incorrect network driver.	Check the network controller documentation for the correct driver or obtain the latest driver from the manufacturer's Web site.
Network status link light does not turn on or it never flashes. NOTE: The network status light should flash when there is network activity.	No active network is detected.	Check cabling and network equipment for proper connection.
	Network controller is not set up properly.	Use the Network control application to verify that the device is working properly.
	Network driver is not properly loaded.	Reinstall network drivers.
Diagnostics reports a failure.	System cannot autosense the network.	Disable auto-sensing capabilities and force the system into the correct operating mode.
	The cable is not securely connected.	Ensure that both ends of the data cable are securely connected.
	The cable is attached to the incorrect connector.	Ensure that the cable is attached to the correct connector.
	There is a problem with the cable or a device at the other end of the cable.	Ensure that the cable and device at the other end are operating correctly.
	Network controller interrupt is shared with an expansion board.	Under the Computer Setup Advanced menu, change the resource settings for the board.
Diagnostics passes, but the workstation does not communicate with the network.	The network controller is defective.	Replace the NIC.
	Network drivers are not loaded, or driver parameters do not match current configuration.	<ol style="list-style-type: none"> 1 Be sure the network drivers are loaded and that the driver parameters match the configuration of the network controller. 2 Be sure the correct network client and protocol is installed.
	The network controller is not configured for this workstation.	Select the Network icon in the Control Panel and configure the network controller.

Table 5-13 Solving Network Problems (Continued)

Problem	Cause	Solution
Network controller stopped working when an expansion board was added to the workstation.	Network controller interrupt is shared with an expansion board.	Under the Computer Setup Advanced menu, change the resource settings for the board.
	The network controller requires drivers.	Verify that the drivers were not accidentally deleted when the drivers for a new expansion board were installed.
	The expansion board installed is a network card (NIC) and conflicts with the embedded NIC.	Under the Computer Setup Advanced menu, change the resource settings for the board.
Network controller stops working without apparent cause.	The files containing the network drivers are corrupted.	Reinstall the network drivers, using the <i>Restore Plus!</i> CD.
	The cable is not securely connected.	Ensure that both ends of the cable are securely attached to the correct devices.
	The network controller is defective.	Replace the NIC.
New network card will not boot.	New network card might be defective or might not meet industry-standard specifications.	Install a working, industry-standard NIC, or change the boot sequence to boot from another source.
Cannot connect to network server when attempting Remote System Installation.	The network controller is not configured properly.	Verify Network Connectivity, that a DHCP Server is present, and that the Remote System Installation Server contains the NIC drivers for your NIC.
System setup utility reports unprogrammed EEPROM.	Unprogrammed EEPROM.	Flash the ROM.

Solving Memory Problems



CAUTION For those systems that support ECC memory, HP does not support mixing ECC and non-ECC memory. Otherwise, the system will not boot the operating system.

Table 5-14 Solving Memory Problems

Problem	Cause	Solution
System will not boot or does not function properly after installing additional memory modules.	Memory module is not the correct type or speed or the new memory module is not seated properly.	Replace module with the correct industry-standard device for the workstation. On some models, ECC and non-ECC memory modules cannot be mixed.
	Out of memory error.	Use the Device Manager to check memory configuration.
Memory count during POST is wrong.	You have run out of memory to run the application.	Check the application documentation to determine the memory requirements.
	The memory modules might not be installed correctly.	Check that the memory modules have been installed correctly and that proper modules are used.
Insufficient memory error during operation.	Too many Terminate and Stay Resident programs (TSRs) are installed.	Delete any TSRs that you do not need.
	You have run out of memory for the application.	Check the memory requirements for the application or add more memory to the workstation.
Power LED flashes Red five times, once every second, followed by a two-second pause, and the workstation beeps five times.	Memory is installed incorrectly or is bad.	1 Reseat DIMMs.
		2 Replace DIMMs one at a time to isolate the faulty module.
		3 Replace third-party memory with HP memory.
		4 Replace the system board.

Solving Processor Problems

Table 5-15 Solving Processor Problems

Problem	Cause	Solution
Poor performance is experienced.	Processor is hot.	<ol style="list-style-type: none">1 Be sure the airflow to the workstation is not blocked.2 Be sure the fans are connected and working properly (some fans only operate when needed).3 Be sure the processor heatsink is installed properly.
Power LED is Red and stays on.	Processor is not seated properly or not installed.	<ol style="list-style-type: none">1 Check to see that the processor is present.2 Reseat the processor.

Solving CD-ROM and DVD Problems

Table 5-16 Solving CD-ROM and DVD Problems

Problem	Cause	Solution
System will not boot from CD-ROM or DVD drive.	The CD-ROM or DVD boot is not enabled through the Computer Setup utility.	Run the Computer Setup utility and enable booting to removable media and verify boot order settings.
	Non-bootable CD in drive.	Try a bootable CD in the drive.
CD-ROM or DVD devices are not detected or driver is not loaded.	Drive is not connected properly or not properly configured.	<ol style="list-style-type: none">1 Reconnect power and data cables to the drive.
		<ol style="list-style-type: none">2 Install correct device driver.
Movie will not play in the DVD drive.	Movie might be regionalized for a different country.	Refer to the documentation that came with the DVD drive.
	Decoder software is not installed.	Install decoder software.
Cannot eject compact disc (tray-load unit).	Disc not properly seated in the drive.	<ol style="list-style-type: none">1 Turn off the workstation and insert a thin metal rod into the emergency eject hole and push firmly.
		<ol style="list-style-type: none">2 Slowly pull the tray out from the drive until the tray is fully extended, then remove the disc.

Table 5-16 Solving CD-ROM and DVD Problems (Continued)

Problem	Cause	Solution
CD-ROM, CD-RW, DVD-ROM, or DVD-R/RW drive cannot read a disc or takes too long to start.	CD has been inserted upside down.	Re-insert the CD with the label facing up.
	The DVD-ROM drive takes longer to start because it has to determine the type of media played, such as audio or video.	Wait at least 30 seconds to let the DVD-ROM drive determine the type of media being played. If the disc still does not start, read the other solutions listed for this topic.
	CD or DVD disc is dirty.	Clean CD or DVD with a CD cleaning kit.
	Windows does not detect the CD-ROM or DVD-ROM drive.	<ol style="list-style-type: none"> 1 Use Device Manager to remove or uninstall the device in question. 2 Restart the workstation and let Windows detect the device.
Recording audio CDs is difficult or impossible.	Wrong or poor quality media type.	<ol style="list-style-type: none"> 1 Try using a slower recording speed. 2 Verify that you are using the correct media for the drive. 3 Try a different brand of media. Quality varies widely between manufacturers.

Solving Internet Access Problems

Table 5-17 Solving Internet Access Problems

Problem	Cause	Solution
Unable to connect to the Internet.	Internet Service Provider (ISP) account is not set up properly.	Verify Internet settings or contact the ISP for assistance.
	Modem is not set up properly.	Reconnect the modem. Verify the connections are correct using the quick setup documentation.
	Web browser is not set up properly.	Verify that the Web browser is installed and set up to work with your ISP.
	Cable/DSL modem is not plugged in.	Plug in cable/DSL modem. You should see a "power" LED light on the front of the cable/DSL modem.
	Cable/DSL service is not available or has been interrupted due to bad weather.	Try connecting to the Internet at a later time or contact your ISP. (If the cable/DSL service is connected, the "cable" LED light on the front of the cable/DSL modem will be on.)
	The LAN cable is not connected.	Connect the CAT5 10/100/1000 cable between the cable modem and the workstations's RJ-45 connector. (If the connection is good, the "PC" LED light on the front of the cable/DSL modem will be on.)
	IP address is not configured properly.	Contact the ISP for the correct IP address.
Cookies are corrupted.		Windows 2000:
		<ol style="list-style-type: none"> 1 Select Start>Settings>Control Panel. 2 Double-click Internet Options. 3 On the General tab, click the Delete Cookies button.
		Windows XP:
		<ol style="list-style-type: none"> 1 Select Start>Control Panel. 2 Double-click Internet Options. 3 On the General tab, click the Delete Cookies button.
Cannot automatically launch Internet programs.	You must log on to the ISP before some programs will start.	Log on to the ISP and launch the desired program.

Table 5-17 Solving Internet Access Problems (Continued)

Problem	Cause	Solution
Internet takes too long to download Web sites.	Modem is not set up properly.	<p>Verify that the correct modem speed and COM port are selected.</p> <p>For Windows 2000:</p> <ol style="list-style-type: none">1 Select Start>Settings>Control Panel. Continue with step #2. <p>For Windows XP:</p> <ol style="list-style-type: none">1 Select Start>Control Panel. Continue with step #2.2 Double-click System.3 Click the Hardware tab.4 In the Device Manager area, click the Device Manager button.5 Double-click Ports (COM and LPT).6 Right-click the COM port your modem uses, then click Properties.7 Under Device status, verify that the modem is working properly.8 Under Device usage, verify the modem is enabled.9 If there are further problems, click the Troubleshoot button and follow the on-screen instructions.

POST and Error Messages

POST is a series of diagnostic tests that runs automatically when the system is turned on. An audible and visual message occurs if the POST encounters a problem. POST checks the following items to ensure that the workstation system is functioning properly:

- Keyboard
- Memory modules
- Diskette drives
- All SATA, IDE and SCSI mass storage devices
- Processors
- Controllers



NOTE If the Power-On Password is set, a key icon appears on the screen while POST is running. You must enter the password before continuing.

Table 5-18 POST Error Messages

Screen Message	Probable Cause	Recommended Action
101–Option ROM Error	System ROM checksum.	Verify the correct ROM. <ol style="list-style-type: none">1 Flash the ROM, if needed.2 If an expansion card was recently added, remove it and see if the problem remains.3 Clear CMOS.4 If the message disappears, there might be a problem with the expansion card.5 Replace the system board.
102–System Board Failure	DMA, timers, and so on.	<ol style="list-style-type: none">1 Remove expansion boards.2 Replace the system board.
110–Out of Memory for Option ROMs	Option ROM for a device was unable to run due to memory constraints.	Run Computer Setup and enable the ACPO/USB Buffers at Top of Memory under the Advanced>Power-On option.
162–System Options Not Set	Configuration incorrect. RTC (real-time clock) battery might need to be replaced.	<ol style="list-style-type: none">1 Run Computer Setup (F10 Setup).2 Set the date and time under Control Panel or in F10 Setup depending on the operating system.3 If the problem persists, replace the RTC battery.
163–Time and Date Not Set	Invalid time or date in configuration memory. RTC (real-time clock) battery might need to be replaced.	<ol style="list-style-type: none">1 Set the date and time under Control Panel or in F10 Setup depending on the operating system.2 If the problem persists, replace the RTC battery.

Table 5-18 POST Error Messages (Continued)

Screen Message	Probable Cause	Recommended Action
164–Memory Size Error	Memory configuration is incorrect.	<ol style="list-style-type: none"> 1 Run Computer Setup (F10 Setup) or Windows utilities. 2 Be sure memory modules (if any) are installed properly. 3 If third-party memory has been added, test using HP only memory. 4 Verify proper memory module type.
201–Memory Error	RAM failure.	<ol style="list-style-type: none"> 1 Run Computer Setup (F10 Setup) or Windows utilities. 2 Ensure memory and continuity modules are installed correctly. 3 Verify proper memory module type. 4 Remove and replace memory modules one at a time to isolate faulty module. 5 Replace the faulty memory modules. 6 If error persists after replacing memory modules, replace the system board.
207–ECC Corrected Single Bit Errors in Memory Sockets y,y	Single Bit ECC error.	<ol style="list-style-type: none"> 1 Verify proper memory module type. 2 Try another memory socket. 3 Replace memory module if problem persists.
213–Incompatible memory Module in memory Sockets X,X, X	A memory module in memory socket identified in the error message is missing critical SPD information, or is incompatible with the chipset.	<ol style="list-style-type: none"> 1 Verify proper memory module type. 2 Try another memory socket. 3 Replace memory with a module conforming to the SPD standard.
214–DIMM Configuration Warning	DIMMs not installed correctly (not paired correctly).	See “Memory” on page 93 for the correct memory configurations and reseal the DIMMs accordingly.
301–Keyboard Error	Keyboard failure.	<ol style="list-style-type: none"> 1 Reconnect keyboard with workstation turned off. 2 Check connector for bent or missing pins. 3 Ensure that none of the keys are depressed. 4 Replace keyboard.
303–Keyboard Controller Error	I/O board keyboard controller.	<ol style="list-style-type: none"> 1 Reconnect keyboard with workstation turned off. 2 Replace the system board.
304–Keyboard or System Unit Error	Keyboard failure.	<ol style="list-style-type: none"> 1 Reconnect the keyboard with workstation turned off. 2 Ensure that none of the keys are depressed. 3 Replace keyboard. 4 Replace system board.
402–Parallel Port 2 Address Assignment Conflict	IRQ address conflicts with another device.	Reset the IRQ.

Table 5-18 POST Error Messages (Continued)

Screen Message	Probable Cause	Recommended Action
501–Display Adapter Failure	Graphics display controller.	<ol style="list-style-type: none"> 1 Reseat the graphics card (if applicable). 2 Clear CMOS. 3 Verify that the monitor is attached and turned on. 4 Replace the graphics controller.
510–Splash Screen image corrupted	Splash Screen image has errors.	Install latest version of ROMPaq to restore image.
511–CPU, CPUA, or CPUB Fan not detected	Fan is not connected or might have malfunctioned.	<ol style="list-style-type: none"> 1 Reseat fan cable. 2 Reseat the fan. 3 Replace the fan.
512–Chassis, rear chassis, or front chassis fan not detected	Fan is not connected, might have malfunctioned.	<ol style="list-style-type: none"> 1 Reseat chassis, rear chassis, or front chassis fan cable. 2 Reseat chassis, rear chassis, or front chassis fan. 3 Replace chassis, rear chassis, or front chassis fan.
515–Power Supply fan not detected	Power Supply fan not seated properly.	Reseat the power supply connector.
601–Diskette Controller Error	Diskette controller circuitry or diskette drive circuitry incorrect.	<ol style="list-style-type: none"> 1 Run Computer Setup (F10 Setup). 2 Check and/or replace cables. 3 Clear CMOS. 4 Replace diskette drive. 5 Replace the system board.
605–Diskette Drive Type Error	Mismatch in drive type.	<ol style="list-style-type: none"> 1 Run Computer Setup (F10 Setup). 2 Disconnect any other diskette controller devices (tape drives). 3 Clear CMOS.
918–Front USB Not Connected	Front USB is not connected.	Connect front USB cable.
920–Fan Command 4 Pin Connector from Power Supply Not Connected	The 4-pin fan connector from the power supply is not connected.	Connect 4-pin fan connector.
921–Device in PCI Express Slot failed to initialize	PCI Express cards not seated properly.	Reseat all PCI Express cards in their PCI Express slots. If the problem persists, contact the PCI Express card vendor.
1720–SMART Hard Drive Detect Imminent Failure	Hard drive is about to fail. (Some hard drives have a firmware patch that will fix an erroneous error message.)	<ol style="list-style-type: none"> 1 Determine if hard drive is giving correct error message. Run the Drive Protection System test if applicable. 2 Apply firmware patch if applicable (visit http://www.hp.com/support). 3 Back up contents and replace hard drive.

Table 5-18 POST Error Messages (Continued)

Screen Message	Probable Cause	Recommended Action
1721–SMART SCSI Hard Drive detects imminent failure	Hard drive is about to fail. (Some hard drives have a firmware patch that will fix an erroneous error message.)	<ol style="list-style-type: none"> 1 Determine if hard drive is giving correct error message. Run the Drive Protection System test if applicable. 2 Apply firmware patch if applicable (visit http://www.hp.com/support).
1785–MultiBay incorrectly installed	No other IDE device may be attached to the same IDE controller.	Attach the MultiBay as device 0 on the primary IDE controller.
1794–Inaccessible devices attached to SATA 1 and/or SATA 3	Devices attached to the primary IDE controller are inaccessible while the SATA controller is set to “Replace Primary IDE Controller in Setup.	<ol style="list-style-type: none"> 1 Run Computer Setup (F10 Setup). 2 Select Storage>Storage Options and set SATA controller to Add as Separate Controller.
1796–SATA Cabling Error	SATA cables are plugged into the incorrect connectors.	Follow the on-screen directions that are displayed in conjunction with this message. It will direct you to use the four SATA connectors in a particular sequence. The SATA connectors are color-coded dark blue, white, orange, and light blue.
1801–Microcode Patch Error	Processor not supported by ROM BIOS.	Upgrade BIOS to proper version.
1998–Master Boot Record has been lost	The previously saved copy of the MBR has been corrupted.	Run Computer Setup and save the MBR of the current bootable disk.
1998–Master Boot Record has been changed	The current MBR does not match the previously saved copy of the MBR.	Use extreme caution, the MBR might have been updated due to normal disk maintenance activities (disk manager, fdisk, or format). Replacing the previously saved MBR in such situations can cause data loss. If certain that the MBR change is unintentional and undesired (for example, due to a virus), run Computer Setup and restore the previously saved MBR copy. Otherwise, run Computer Setup and either disable MBR security or save the MBR of the current bootable disk.

Appendix A SCSI Devices

This appendix discusses SCSI devices and related issues. This appendix includes the following sections:

- “SCSI Guidelines” on page 154
- “Using SCSISelect with SCSI Devices” on page 154
- “SMART” on page 155
- “Jumpers” on page 155

SCSI Guidelines

When installing and operating SCSI devices, you must follow these guidelines:

- A narrow (50-pin) SCSI controller allows you to daisy-chain up to seven additional SCSI devices. Counting the controller, that amounts to eight total SCSI devices.
- A wide (68-pin) SCSI controller allows you to daisy-chain up to 15 additional SCSI devices. Counting the controller, that amounts to 16 total SCSI devices.
- If two narrow (50-pin) SCSI controllers are each connected to separate system board SCSI connectors, each controller may have seven SCSI devices attached. Counting the controller, this gives a total of 16 SCSI devices on the system.
- HP does not recommend mixing different width SCSI devices on the same SCSI chain or on the same SCSI channel. Mixing devices of different widths on the same chain or channel will always result in a data transfer rate of the slowest machine in that chain. The only exception to this is that Ultra Wide SCSI devices will cause a speed degradation when mixed with other 68-pin devices.
- If multiple SCSI devices are used, split the devices between channels from multiple controllers for optimum performance. Cable length for the second channel should not be longer than 12 meters.
- If two controllers are used, each can use SCSI devices having widths and speeds different from the other. If a 68-pin data cable is used on a controller having 50-pin SCSI devices, use an internal cable adapter or an external cable adapter.



CAUTION Do not route data cables near the air intake to the power supply. Cables routed in this manner may block the airflow and cause the workstation to overheat.

- All SCSI controllers require a unique SCSI ID (0–15) for each SCSI device installed. For more information, see [“Jumpers” on page 155](#).
- 68-pin SCSI controllers require a 12-meter, maximum-length twisted pair, LVD cable with built-in terminator, maximum of 15 drives.
- Every SCSI chain or circuit must be terminated (closed) at both ends. Some system boards have both ends of the SCSI cable connected to, and terminated by, the system board. Termination can be accomplished in one of several ways:
 - Use a cable with a built-in terminator.
 - Use a cable with a terminating resistor plug in the last connector.
 - Connect a SCSI device with its termination enabled into the last connector.
 - Connect an external SCSI device with its termination enabled to the external SCSI connector on the rear panel of the workstation.
- Turn on all external SCSI devices before turning on the power to the workstation. This enables the SCSI controller to recognize the external devices.

Using SCSI*Select* with SCSI Devices

The Ultra160 and faster SCSI host adapters include the SCSI*Select* utility to configure the host adapter and to run the SCSI disk utilities. To run the SCSI Select utility:

- In POST Messages Enabled mode: Press **Ctrl+A** when the “Press<Ctrl><A> for SCSI*Select* Utility” message appears during POST.
- In POST Messages Disabled mode: When the HP logo screen appears, press any key to exit the logo screen. Immediately after exiting the logo screen, press **Ctrl+A** to access the SCSI*Select* utility.

A menu appears with the following options:

- Configure/View Host Adapter Settings
 - SCSI Bus Interface Definitions
 - Host Adapter SCSI ID
 - SCSI Parity Checking
 - Host Adapter SCSI Termination
 - Additional Options
 - Boot Device Options
 - SCSI Device Configuration
 - Advanced Configuration Options
- SCSI Disk Utilities
 - Lists all SCSI devices and SCSI ID numbers



NOTE For additional information about configuring POST message display status, refer to “[Computer Setup Menu](#)” on page 37.

SMART

The SMART SCSI hard drives for HP workstations have built-in drive failure prediction that warns the user or the network administrator of an impending failure or crash of the hard drive. SMART drives track fault prediction and failure indication parameters, such as re-allocated sector count, spin retry count, and calibration retry count. If the drive determines that a failure is imminent, it generates a fault alert.

Jumpers

All SCSI controllers require a unique SCSI ID (0–15) for each SCSI device installed.

The controller identifies a SCSI device by its SCSI ID number rather than its location. Moving a SCSI device from one position to another on the SCSI chain does not affect communication between the controller and the device.

The reserved and available SCSI ID numbers are displayed in the following list:

- 0 is reserved for the primary hard drive (not reserved for the primary hard drive on Linux).
- 7 is reserved for the SCSI controller.
- 1 through 6 and 8 through 15 are available for all other SCSI devices.

When 0 is used for the primary hard drive, set the second hard drive to 1, the third to 2, and so on.

To set the SCSI ID on a drive, refer to the instructions on top/back of the hard drive for the correct jumper settings. The drive probably displays a diagram of the jumper block. This diagram shows you which blocks to cover with your jumper to get the desired ID.

For example, if the drive needs to be set to 3, the drive might show that the 3 ID bits are at the far left of the connector (ID0, ID1, ID2, and ID3), then using the jumpers provided, cover each block to set the SCSI ID.



NOTE After changing the jumper settings, reboot the workstation to recognize the new address.

Appendix B SATA Devices

This appendix discusses SATA devices and related issues. This appendix contains the following sections:

- “SATA Guidelines” on page 157
- “Boot Order” on page 158
- “Hard Drive Configurations” on page 158

SATA Guidelines



NOTE These systems support a mixed configuration of UATA/IDE, SCSI, and SATA hard drives. While HP supports the presence of IDE drives, it does not ship any configurations using those drives.



NOTE The HP Workstation xw4200 has four SATA ports on the system board to cover all the internal hard drive mounting points. The first SATA drive (boot drive if booting from SATA) should be connected to the port labeled SATA0, and a second drive to SATA1 if needed.

When installing and operating SATA devices, you must:

- Use the SATA data cables with the 90-degree connector (326965-001) for the hard drive bays. The 90-degree connector goes to the hard drive.
- Use the longest data cable with the straight connectors (326965-002) if installing a hard drive in an optical bay.
- When hooking up an IDE drive on an IDE bus that also has an optical drive on it, put the hard drive in the master position and the optical drive in the slave position.



CAUTION Do not route data cables near the air intake to the power supply. Cables routed in this manner might block the airflow and cause the workstation to overheat.

For complete and current information on supported accessories and components, visit <http://www.partsurfer.hp.com>.

Boot Order

You can modify the boot order in the Computer Setup Utility by arranging the Controller Order on the Storage tab. You can also arrange the boot order on the Storage tab.

Hard Drive Configurations

Whenever one or two drives are to be connected to a plug-in controller, HP recommends that those drives be mounted in the hard drive bays to simplify cabling. When a third drive is needed in the optical bay, it can also be connected to the plug-in controller, or to a system board if it is a SATA drive. A bracket is required to mount a hard drive in the optical bays.



NOTE The first hard drive bay is the recommended position for the drive containing the bootable OS.

SATA Raid Configurations

This workstation supports an embedded SATA RAID. RAID (Redundant Array of Inexpensive Disks) combines multiple physical drives together to provide either increased performance or increased redundancy.

For an embedded SATA RAID, there are two primary configurations.

- RAID 0 is a striping configuration. For example, this combines two 80 GB drives into one 160 GB drive. Both physical drives can be accessed simultaneously for better performance. This is faster than using two 80 GB drives separately.
- RAID 1 is a mirroring configuration. For example, this uses two 80 GB drives, but one drive is a complete mirror of the other drive. The system remains functional and no data is lost if one of the drives should fail.

There are other RAID configurations, but they are not supported on an embedded SATA RAID.



NOTE For information on the integrated SATA RAID, visit <http://www.hp.com/go/workstationsupport> and review the supplier's documentation. For information on supported SATA RAID configurations, visit <http://www.hp.com/go/productbulletin>.

Appendix C Ultra ATA Devices

This appendix discusses the guidelines and features for Ultra ATA drives.



NOTE This system supports a mixed configuration of UATA/IDE, SCSI, and SATA hard drives. While HP supports the presence of IDE drives, it does not ship any configurations using those drives.

This appendix includes the following sections:

- “Ultra ATA Jumpers” on page 160
- “Ultra ATA Cables” on page 160
- “Drive Installation Guidelines” on page 160
- “SMART” on page 162
- “Jumpers” on page 162

Ultra ATA Jumpers

Ultra ATA drives are configured with jumper settings. With cable-select, the drive is configured as either Master (Drive/Device 0) or Slave (Drive/Device 1) by its physical attachment to the cable.

If you purchase a third-party hard drive, refer to the documentation included with the drive kit to ensure proper cable installation and configuration.



NOTE All drives on a controller channel need to have their jumpers either in the cable-select mode or have the individual drive jumper installed on the appropriate Master (Drive/Device 0) or Slave (Drive/Device 1) position.

Ultra ATA Cables

When installing a second device on the primary controller, you must use an industry-standard, 80-conductor Ultra ATA cable for optimal performance. These cables have a maximum length of 18 inches and a maximum distance of six inches between the two devices for a two-drive cable.

Drives operating at speeds faster than those of the Ultra ATA-33 devices require industry-standard, 40-pin, 80-conductor cables to maintain the higher data transfer rates possible with the improved technology.

When using Ultra ATA-133, -100, -66, and slower -33 drives in the same system, each drive will operate at its appropriate data transfer rate.



NOTE On a two-drive cable, the Drive/Device 0 connector is always the farthest one from the system board connector and the Drive/Device 1 connector is always the closest to the system board connector.



NOTE Some cables might be labeled “Drive 0” instead of “Device 0” and “Drive 1” instead of “Device 1.”

Drive Installation Guidelines

The HP Workstation xw4200 system board has one Ultra ATA (IDE) controller channel designated as the primary controller.

The controller can have up to two devices attached to it, and all drives are connected to this controller using an industry-standard, 80-conductor cable.



NOTE The industry-standard, 1.44-MB diskette drive has its own separate channel and is not included as a part of the maximum four drives.

Any drive attached to a controller must have a drive designation. If only a single drive is connected to a controller and its jumper is in the cable-select position, it is designated as the Master Drive (Drive/Device 0) by its attachment to the Drive/Device 0 cable position. If two cable-selected drives are connected to a single controller, one will be designated by its attachment to the cable as the master (Drive/Device 0) and the other as slave (Drive/Device 1).

Device Classes

To determine the best drive attach sequence, Ultra ATA/ATAPI drives are segregated into four different classes based on the bandwidth demands they place on an Ultra ATA controller. The most demanding devices are in Class 1. The least demanding devices are in Class 4. The following table illustrates those classes.

Table C-1 Device Classes

Class 1 Hard Drives	Class 2 High Speed Optical Drives	Class 3 Optical Storage Drives	Class 4 Magnetic Storage Drives
Ultra ATA-100 Ultra ATA-66 Ultra ATA-33	DVD DVD-CD R/W	R/W CD-ROM CD-ROM	LS-120 Tape Zip

General Attach Guidelines

- The lower the device class number, the faster the device and the more bandwidth required.
- Drives installed in the Device 0 position receive the greatest possible bandwidth.

Attach Sequence Rules by Class Priority

The following table summarizes the attach sequence rule.

Table C-2 General Attach Sequence Rule*

Sequence	Description
1	The lowest class drive—bootable hard drive recommended.
2	If only two drives, the last drive goes here; otherwise the lowest class of the remaining drives.

*If there are three or more devices, two or more of which are hard drives, two hard drives should be attached to the primary controller first before following the General Attach Sequence Rule.

Additional Drive Application Notes

- When replacing a hard drive, the replacement should be of the same type (Ultra ATA 33, -66, or -100) as that being removed to retain the same level of performance.
- When Ultra ATA and SATA hard drives are mixed in the same system, the SATA drive will become the boot drive unless the boot order is changed in Computer Setup (F10). The default boot order on this system prefers SATA, then Ultra ATA, then SCSI.

SMART

The Self Monitoring Analysis and Recording Technology (SMART) Ultra ATA drives for HP workstations have built-in drive failure prediction that warns the user or network administrator of an impending failure or crash of the hard drive. The SMART drive tracks fault prediction and failure indication parameters, such as reallocated sector count, spin retry count, and calibration retry count. If the drive determines that a failure is imminent, it generates a fault alert.

Jumpers

The specifications included below are the standard drive configurations.

CD-ROM or DVD-ROM Drive

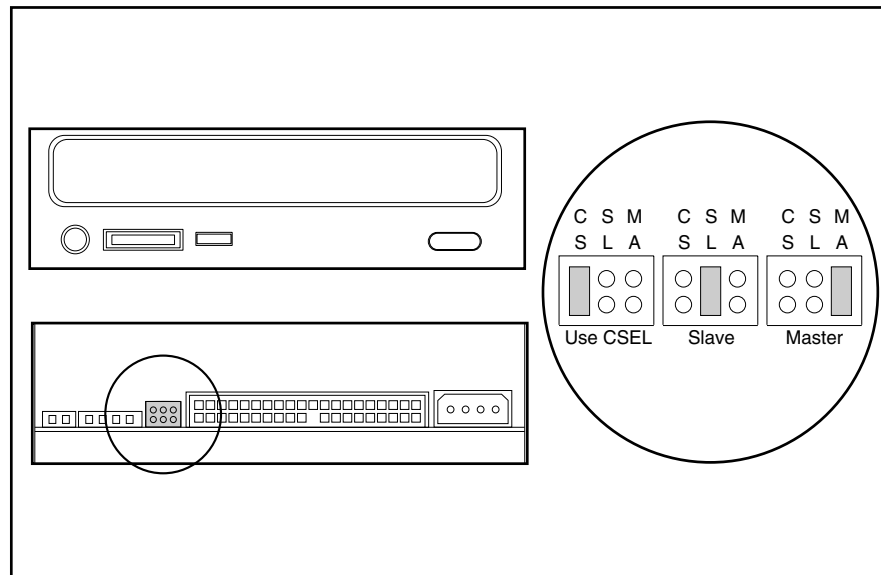



Figure C-1 CD-ROM or DVD-ROM Drive Jumper Connections

Appendix D Connector Pins


This appendix contains the pin assignments for many workstation connectors. Some of these connectors might not be used on the product being serviced. This appendix contains the following sections:

- “Enhanced Keyboard” on page 164
- “Mouse” on page 164
- “Ethernet RJ-45” on page 164
- “Parallel Interface” on page 165
- “Serial Interface” on page 165
- “USB” on page 165
- “Microphone” on page 166
- “Headphone” on page 166
- “Line-In Audio” on page 166
- “Line-Out Audio” on page 166
- “Ultra SCSI” on page 167
- “SATA” on page 167
- “Monitor” on page 168
- “ATA/ATAPI (IDE) Standard Drive Cable” on page 168
- “24-Pin Power” on page 169
- “4-Pin Power (for CPU)” on page 169
- “6-Pin PCI Express” on page 169
- “DVI-I Signals” on page 170


Enhanced Keyboard

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

Mouse

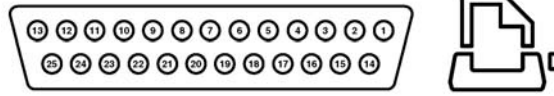
Connector and Icon	Pin	Signal
	1	Data
	2	Unused
	3	Ground
	4	+5 VDC
	5	Clock
	6	Unused

Ethernet RJ-45

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

Parallel Interface

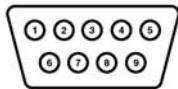
Connector and Icon



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

Serial Interface

Connector and Icon



Pin Signal

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

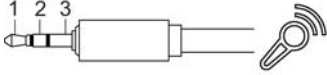
USB

Cable connector and Icon

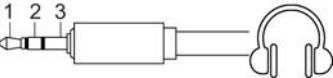


Pin	Signal
1	+5 VDC
2	- Data
3	+ Data
4	Ground

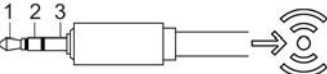
Microphone

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

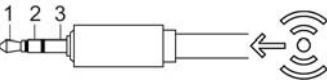
Headphone

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

Line-In Audio

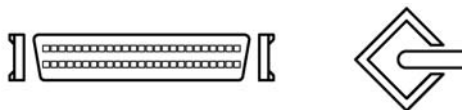
Connector and Icon (1/8")	Pin	Signal
	1 (Tip) 2 (Ring) 3 (Shield)	Audio_In_Left Audio_In_Right Ground

Line-Out Audio

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

Ultra SCSI

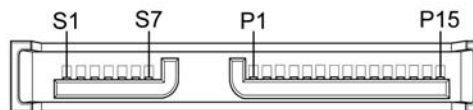
Connector and Icon



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	DBP	42	Ground	50	Input/Output
27	DB1	35	Ground	43	BSY #		
28	DB2	36	Ground	44	ACK #		

SATA

Connector

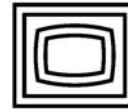
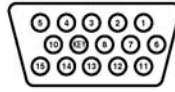


Pin	Usage	Pin	Usage	Pin	Signal
Data Cable		Power Cable		Power Cable	
S-1	Ground	P-1	3.3 V power	P-8	5V power
S-2*	A+	P-2	3.3 V power	P-9	5V power
S-3*	A-	P-3	3.3 V power	P-10	Ground
S-4	Ground	P-4	Ground	P-11	Reserved
S-5**	B-	P-5	Ground	P-12	Ground
S-6**	B+	P-6	Ground	P-13	12V power
S-7	Ground	P-7	5V power	P-14	12V power
				P-15	12V power

*S-2 and S-3 differential signal pair
 **S-5 and S-6 differential signal pair

Monitor

Connector and Icon



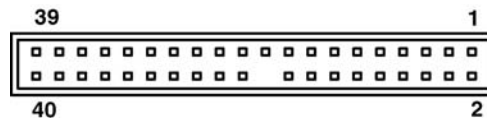
Pin	Signal	Pin	Signal	Pin	Signal
1	Red Analog	6	Ground	11	Monitor ID
2	Green Analog	7	Ground	12	DDC Serial Data
3	Blue Analog	8	Ground	13	Horizontal Sync
4	Monitor ID	9	+5 V DC	14	Vertical Sync
5	Ground	10	Ground	15	DDC Serial Clock



NOTE Monitor connectors might vary depending on your configuration.

ATA/ATAPI (IDE) Standard Drive Cable

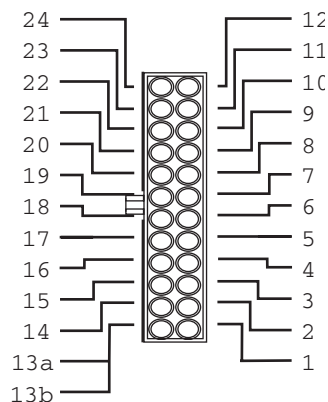
Connector



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

24-Pin Power

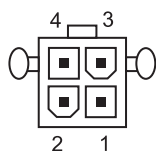
Connector



Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	+3.3 V	7	GND	13	+3.3 V	19	GND
2	+3.3 V	8	POK	14	-12 V	20	NC
3	GND	9	+5 Vaux	15	GND	21	+5 V
4	+5 V	10	+12 V	16	PSON	22	+5 V
5	GND	11	+12 V	17	GND	23	+5 V
6	+5 V	12	+3.3 V	18	GND	24	GND

4-Pin Power (for CPU)

Connector and Icon

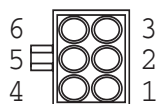


Pin Signal

1	GND
2	GND
3	+12 V
4	-12 V

6-Pin PCI Express

Connector and Icon



Pin Signal

1	+12 V
2	+12 V
3	+12 v
4	GND
5	GND
6	GND

DVI-I Signals

Connector and Icon	Pin	Signal
	1	TMDS Data2 -
	2	TMDS Data2 +
	3	TMDS Data2/4 shield
	4	TMDS Data4 -
	5	TMDS Data4 +
	6	DCC Clock (SCL)
	7	DCC Bi-directional Data (SDA)
	8	Analog Vertical Sync
	9	TMDS Data1 -
	10	TMDS Data1 +
	11	TMDS Data1/3 shield
	12	TMDS Data3 -
	13	TMDS Data3 +
	14	+5V DC Power
	15	Ground Return: +5V, Hsync, Vsync
	16	Hot Plug Detect
	17	TMDS Data0 -
	18	TMDS Data0 +
	19	TMDS Data0/5 shield
	20	TMDS Data5 -
	21	TMDS Data5 +
	22	TMDS Clock shield
	23	TMDS Clock +
	24	TMDS Clock -
	C1	Analog Red
C2	Analog Green	
C3	Analog Blue	
C4	Analog Horizontal Sync	
C5	Analog Ground Return: analog Red, Green, Blue	

Appendix E System Board Designators

This appendix lists the system board reference designators for this system.

Table E-1 System Board Designators

Designator	Silkscreen	Component
MH01-MH10	N/A	Mounting holes
CR1	5V_AUX	LED: 5V_AUX power indicator
N/A	N/A	Power LED
P14	N/A	Boot block header/jumper
E49	N/A	Clear password header/jumper
J20	SLOT3 PCI	PCI slot
J21	SLOT4 PCI	PCI slot
J22	SLOT5 PCI	PCI slot
J23	SLOT6 PCI	PCI slot
J31	SLOT7 PCI-E X1	PCI Express slot
J34	SLOT1 PCI-E X1	PCI Express slot
J41	SLOT2 PCI-E X16 GRAPHICS	PCI Express x16 slot for graphics
J50	PARALLEL	Parallel port
J68	KBD_MSE	Stacked keyboard/mouse connector
J9	RJ/USB	Stacked RJ45/Dual USB
J10	QUAD USB	Quad stacked USB
J83	AUDIO	Triple stacked audio jack
P1	P/S	Power supply connector (24 pin)
P3	N/A	Processor 12V header
P10	FDD	Diskette drive connector
P101	SECURITY	Security board connector
P7	CD-IN	CD analog audio connector

Table E-1 System Board Designators

Designator	Silkscreen	Component
P11	AUX-IN	Auxiliary audio connector
P124	HOOD LOCK	Hood lock header
P125	HD SENSE	Hood sensor header
P20	IDE	Primary IDE connector
P23	FRONT AUDIO	Front panel audio header
P24	FRONT USB	Front panel USB header
P27	MULTIBAY	Multi-Bay header
P29	HDD LED	HDD LED connector
P30	SATA0	Primary serial ATA (SATA) connector
P31	SATA1	Second serial ATA (SATA) connector
P32	SATA2	Third serial ATA (SATA) connector
P33	SATA3	Fourth serial ATA (SATA) connector
P5	CONTROL PANEL	Main power/HDD LED connector
P52	SERIAL B	Flying serial port header
P53	SERIAL A	Serial port
P6	SPK	Speaker connector
P70	CPU FAN	CPU fan header
P8	SYS FAN	Primary chassis fan header
P9	PCI FAN	Secondary chassis fan header
SW50	CMOS	Clear CMOS switch/push button
XBT2	BATTERY	Battery retainer
XMM1	DIMM1	Memory slot
XMM2	DIMM2	Memory slot
XMM3	DIMM3	Memory slot
XMM4	DIMM4	Memory slot
XU1	CPU	Processor socket
XU15	FWH	ROM socket

Appendix F Power Cord Set Requirements

This appendix discusses the power cord set requirements for the HP Workstation xw4200.

The power cord set (flexible cord or wall plug) received with this product meets the requirements for use in the country where you purchased the equipment.

If you must obtain a power cord for a different country, you should purchase a power cord that is approved for use in that country.

The power cord must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cord should be greater than the voltage and current rating marked on the product. In addition, the diameter of the wire must be a minimum of 0.75 mm² or 18AWG, and the length of the cord must be between 6 feet (1.8 m) and 12 feet (3.6 m). If you have questions about the type of power cord to use, contact the HP authorized service provider.

A power cord should be routed so that it is not likely to be walked on or pinched by items placed upon it or against it. Particular attention should be paid to the plug, electrical outlet, and the point where the cord exits from the product.

Appendix G Routine Care

This appendix discusses routine care procedures for the HP Workstation xw4200. This appendix includes the following sections:

- “General Cleaning Safety Precautions” on page 176
- “Maximizing the Airflow” on page 176
- “Cleaning the Workstation Case” on page 176
- “Cleaning the Monitor” on page 177
- “Cleaning the Mouse” on page 177

General Cleaning Safety Precautions

When cleaning the workstation, follow these general precautions:

- 1 Never use solvents or flammable solutions to clean the workstation.
- 2 Never immerse any parts in water or cleaning solutions; apply any liquids to a clean cloth and then use the cloth on the component.
- 3 Always unplug the workstation when cleaning with liquids or damp cloths.
- 4 Always unplug the workstation before cleaning the keyboard, mouse, or air vents.
- 5 Disconnect the keyboard before cleaning it.
- 6 Wear safety glasses equipped with side shields when cleaning the keyboard.

Maximizing the Airflow

Keep your workstation in an area where the airflow to the front and rear of the system is not obstructed.

- If possible, keep the unit off of surfaces where dust can gather.
- Keep the back of the unit at least six inches away from a wall or other obstruction.
- Keep the front of the unit clear of any obstruction that keeps air from entering the front of the system.
- Remove any dust on the front panel (vent area) and the rear fans with a small vacuum, compressed air, and dust rag.

Cleaning the Workstation Case

Follow all safety precautions stated earlier before cleaning the workstation.

To clean the workstation case:

- To remove light stains or dirt, use plain water with a clean, lint-free cloth or swab.
- For stronger stains, use a mild dish-washing liquid diluted with water. Rinse well by wiping it with a cloth or swab dampened with clear water.
- For stubborn stains, use isopropyl (rubbing) alcohol. No rinsing is needed as the alcohol will evaporate quickly and not leave a residue.
- After cleaning, always wipe the unit with a clean, lint-free cloth.
- Occasionally clean the air vents on the workstation. Lint and other foreign matter can block the vents and limit the airflow.

Cleaning the Keyboard

Follow all safety precautions stated earlier before cleaning the keyboard.

When cleaning debris from under the keys, review all rules in the previous section, then:



CAUTION Use safety glasses equipped with side shields before attempting to clean debris from under the keys.

- Visible debris underneath or between the keys can be removed by vacuuming or shaking.
- Canned, pressurized air can be used to clean debris from under the keys. Caution should be used as too much air pressure can dislodge lubricants applied under the wide keys.
- If you remove a key, use a specially designed key puller to prevent damage to the keys. This tool is available through many electronic supply outlets.



CAUTION Never remove a wide-leveled key (like the space bar) from the keyboard. If these keys are improperly removed or installed, the keyboard might not function properly.

- Cleaning under a key can be done with a swab moistened with isopropyl alcohol and squeezed out. Be careful not to wipe away lubricants necessary for proper key functions. Use tweezers to remove any fibers or dirt in confined areas. Allow the parts to air dry before reassembly.

Cleaning the Monitor

Follow all safety precautions stated earlier before cleaning the monitor.

To clean the monitor, wipe the monitor screen with a clean cloth moistened with water or with a towelette designed for cleaning monitors. Do not use sprays or aerosols directly on the screen; the liquid might seep into the housing and damage a component. Never use solvents or flammable liquids on the monitor.

Cleaning the Mouse

Follow all safety precautions stated earlier before cleaning the mouse.

To clean the mouse:

- Clean the mouse ball by first removing the retaining plate and the ball from the housing.
- Pull out any debris from the ball socket and wipe the ball with a clean, dry cloth before reassembly.

Appendix H Additional Password Security and Resetting CMOS

This appendix discusses additional password security and CMOS (complementary metal oxide semiconductor)-related issues for the HP Workstation xw4200. This appendix includes the following sections:

- “Resetting the Password Jumper” on page 180
- “Clearing and Resetting the CMOS” on page 181

This workstation supports security password features, which can be established through the Computer Setup Utilities menu. These features are:

- setup password
- power-on password

When you establish only a setup password, the power-on password is required to access Computer Setup and any other information on the workstation. When you establish both passwords, only the setup password will give you access to Computer Setup.

When both passwords are set, the setup password can also be used in place of the power-on password as an override to log in to the workstation. This is a useful feature for a network administrator.

If you forget the password for the computer, there are two methods for clearing that password so you can gain access to the information on the workstation:

- resetting the password jumper
- using the Clear CMOS button



CAUTION Pushing the CMOS button resets CMOS values to factory defaults and erases any customized information including passwords, asset numbers, and special settings. It is important to back up the workstation CMOS settings before resetting them in case they are needed later. To back up the CMOS settings, use Computer Setup and run the Save to Diskette option from the File menu.

Resetting the Password Jumper

To disable the power-on or setup password features, and clear the power-on and setup passwords:

- 1 Shut down the operating system and then turn off the workstation and any external devices. Disconnect the power cord of the workstation and any external devices from the power outlets.
- 2 Disconnect the keyboard, monitor, and any other external devices that are connected to the workstation.



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



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



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

- 3 Remove the access panel.
- 4 Locate the header and jumper. The password jumper is E49.



NOTE The password jumper is green so that it can be easily identified. For assistance locating the password jumper and other system board components, see [“System Board Components” on page 17](#).

- 5 Remove the jumper from pins 1 and 2. Place the jumper on either pin 1 or 2, but not both, so it does not get lost.
- 6 Replace the access panel.
- 7 Reconnect the external equipment.
- 8 Plug in the workstation and turn on the power. Allow the operating system to start. This clears the current passwords and disables the password features.
- 9 To establish new passwords, repeat steps 1 through 4, replace the password jumper on pins 1 and 2, then repeat steps 6 through 8. Establish the new passwords in Computer Setup.

Clearing and Resetting the CMOS

The CMOS of the workstation stores password information and information about the workstation configuration. This section describes the steps to successfully clear and reset the CMOS.

Using the CMOS Button

To use the CMOS button:

- 1 Shut down the operating system and then turn off the workstation and any external devices. Disconnect the power cord of the workstation and any external devices from the power outlets.
- 2 Disconnect the keyboard, monitor, and any other external devices that are connected to the workstation.



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



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



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

- 3 Remove the access panel.



CAUTION Pushing the CMOS button resets CMOS values to factory defaults and erases any customized information including passwords, asset numbers, and special settings. It is important to back up the workstation CMOS settings before resetting them in case they are needed later. To back up the CMOS settings, use Computer Setup and run the Save to Diskette option from the File menu.

- 4 Locate, press, and hold the CMOS button in for five seconds.



NOTE Be sure that the AC power cord is disconnected from the power outlet. The CMOS button does not clear CMOS if the power cord is connected.



NOTE For assistance locating the CMOS button and other system board components, see [“System Board Components” on page 17](#).

- 5 Replace the access panel.
- 6 Reconnect any external devices.
- 7 Plug in the workstation power and turn the power back on.



NOTE The workstation passwords and any special configurations along with the system date and time will have to be reset.

Using Computer Setup to Reset CMOS

To reset CMOS using Computer Setup, access the Computer Setup Utilities menu. When the Computer Setup message appears in the lower-right hand corner of the screen, press the F10 key. Press Enter to bypass the title screen, if necessary.



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

From the Computer Setup menu, select **File>Set Defaults and Exit**. This restores the soft settings that include boot sequence order and other factory settings. It does not, however, force hardware rediscovery.



NOTE The workstation passwords and any special configurations along with the system date and time will have to be reset.

Appendix I Quick Troubleshooting Flows

This appendix presents some quick troubleshooting flowcharts for some common issues. This appendix contains the following sections:

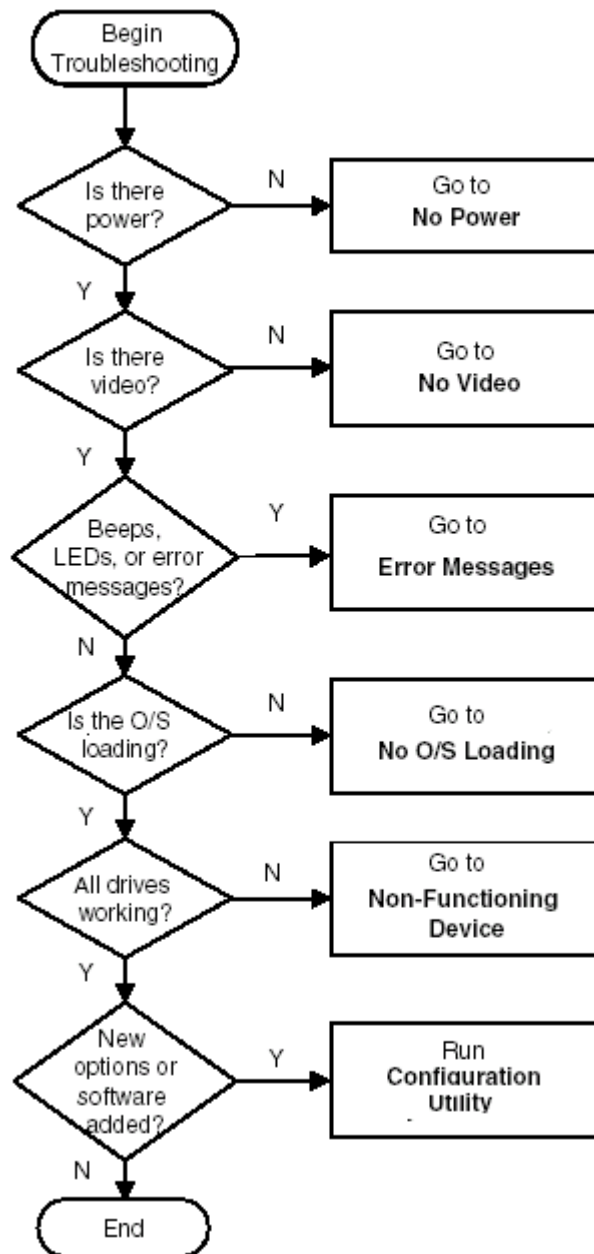
- “Initial Troubleshooting” on page 184
- “No Power” on page 185
- “No Video” on page 188
- “Error Messages” on page 191
- “No OS Loading” on page 194
- “No OS Loading from Hard Drive” on page 195
- “No OS Loading from Diskette Drive” on page 198
- “No OS Loading from CD-ROM Drive” on page 199
- “No OS Loading from Network” on page 200
- “Non-Functioning Device” on page 201

Additional information about troubleshooting can be found in [“System Diagnostics and Troubleshooting” on page 115](#).



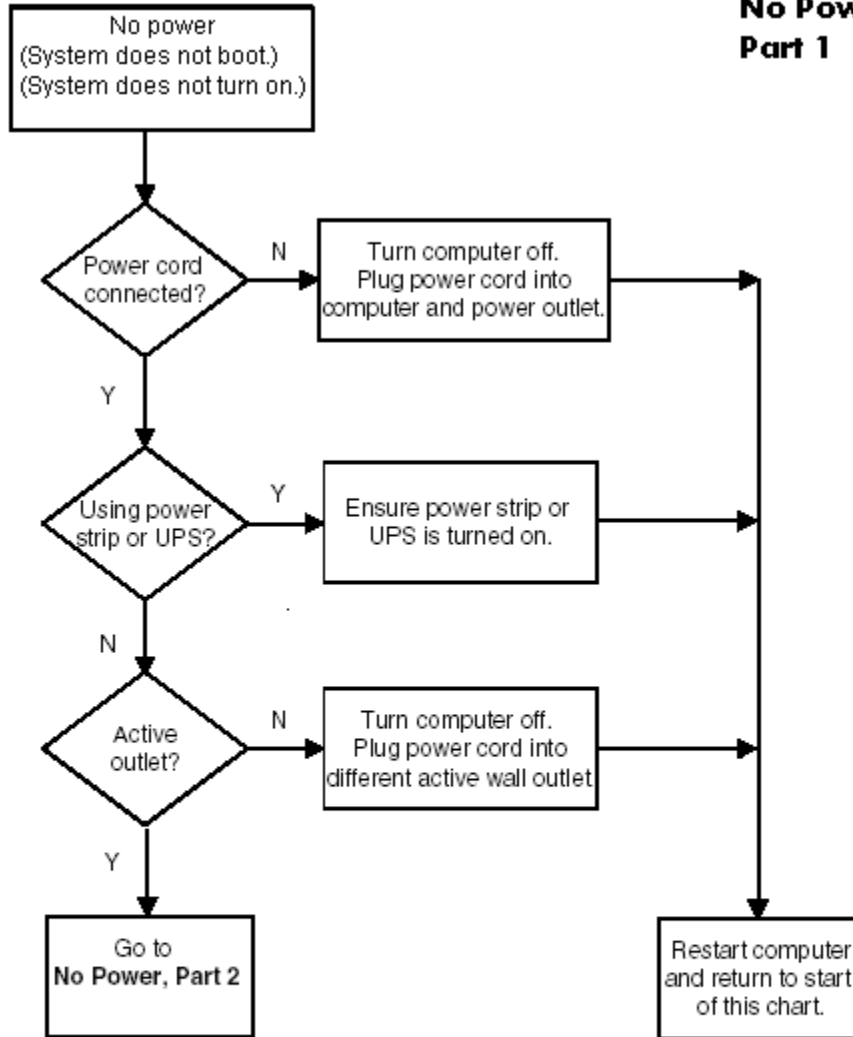
NOTE The flowcharts presented here are for general troubleshooting purposes only and they might not apply to your specific workstation.

Initial Troubleshooting



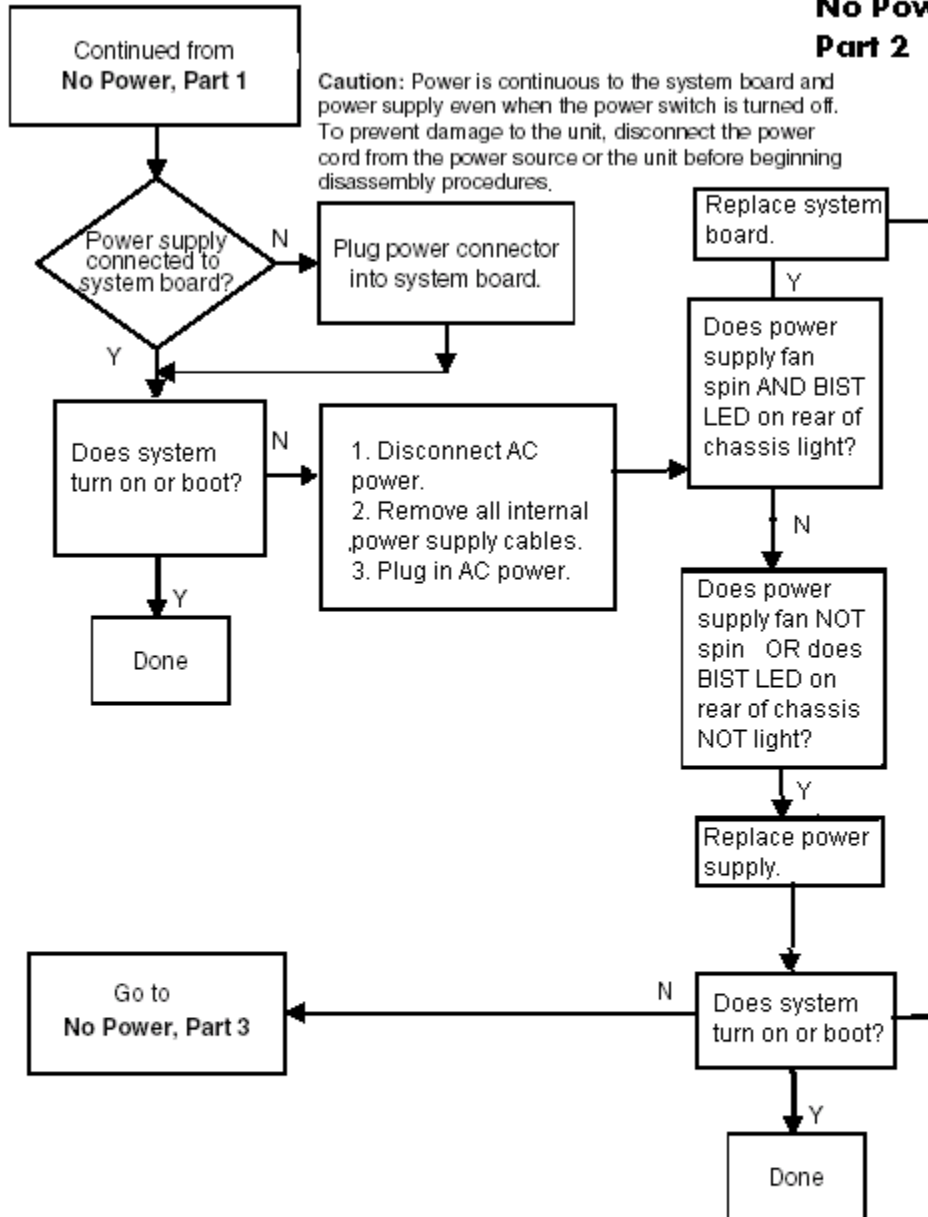
No Power

No Power Part 1

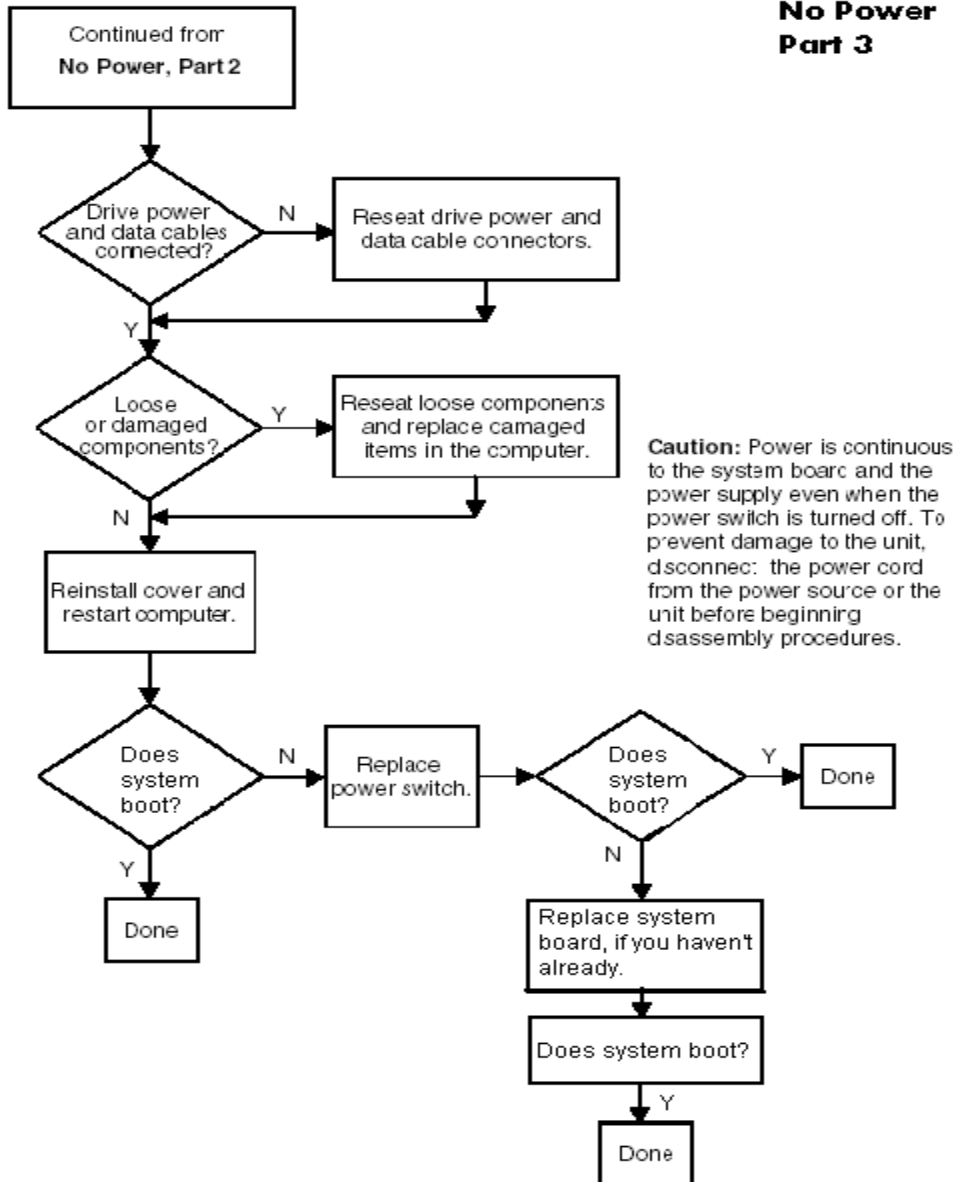


Caution: Power is continuous to the system board and power supply even when the power switch is turned off. To prevent damage to the unit, disconnect the power cord from the power source or the unit before beginning disassembly procedures.

No Power Part 2

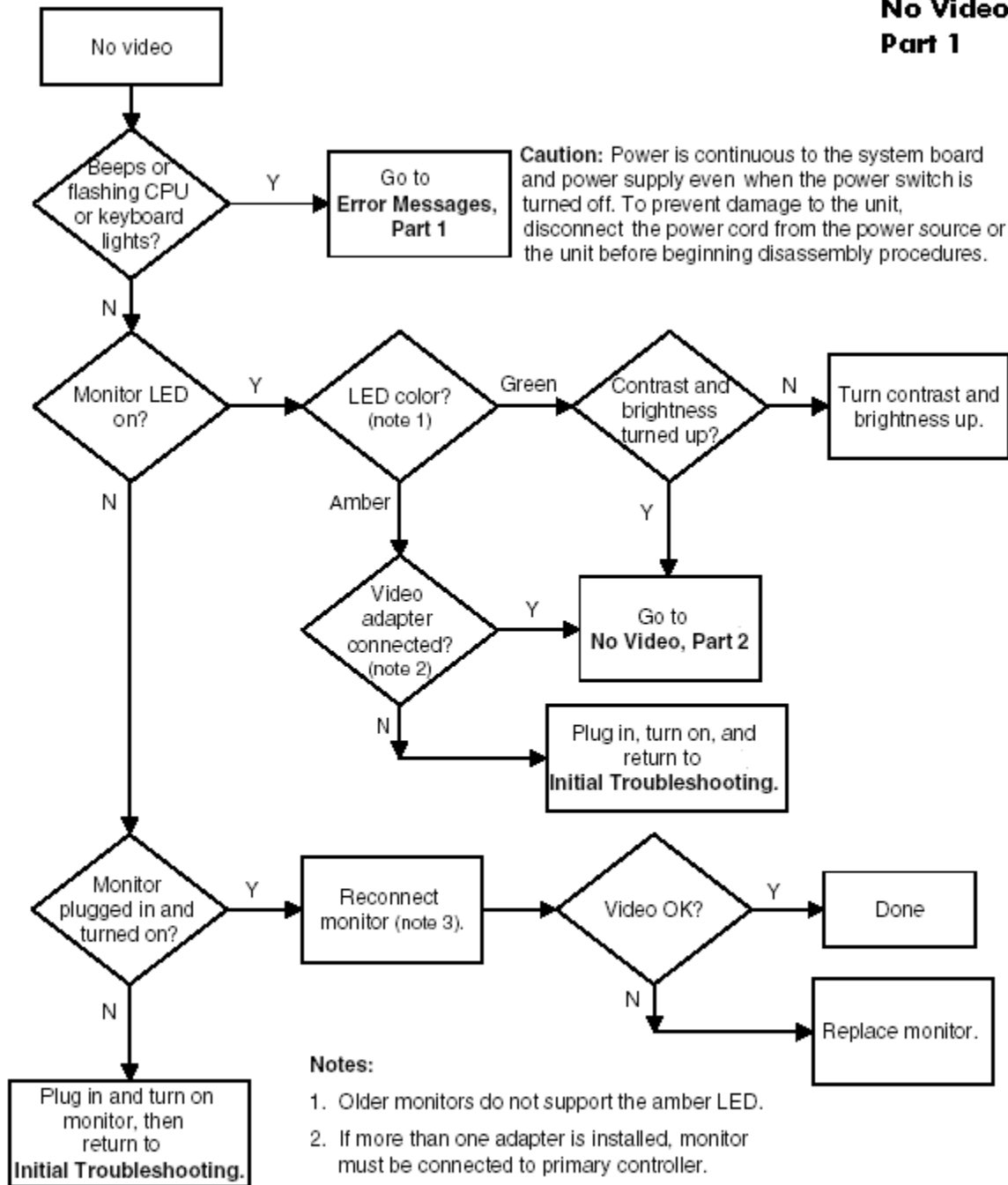


No Power Part 3

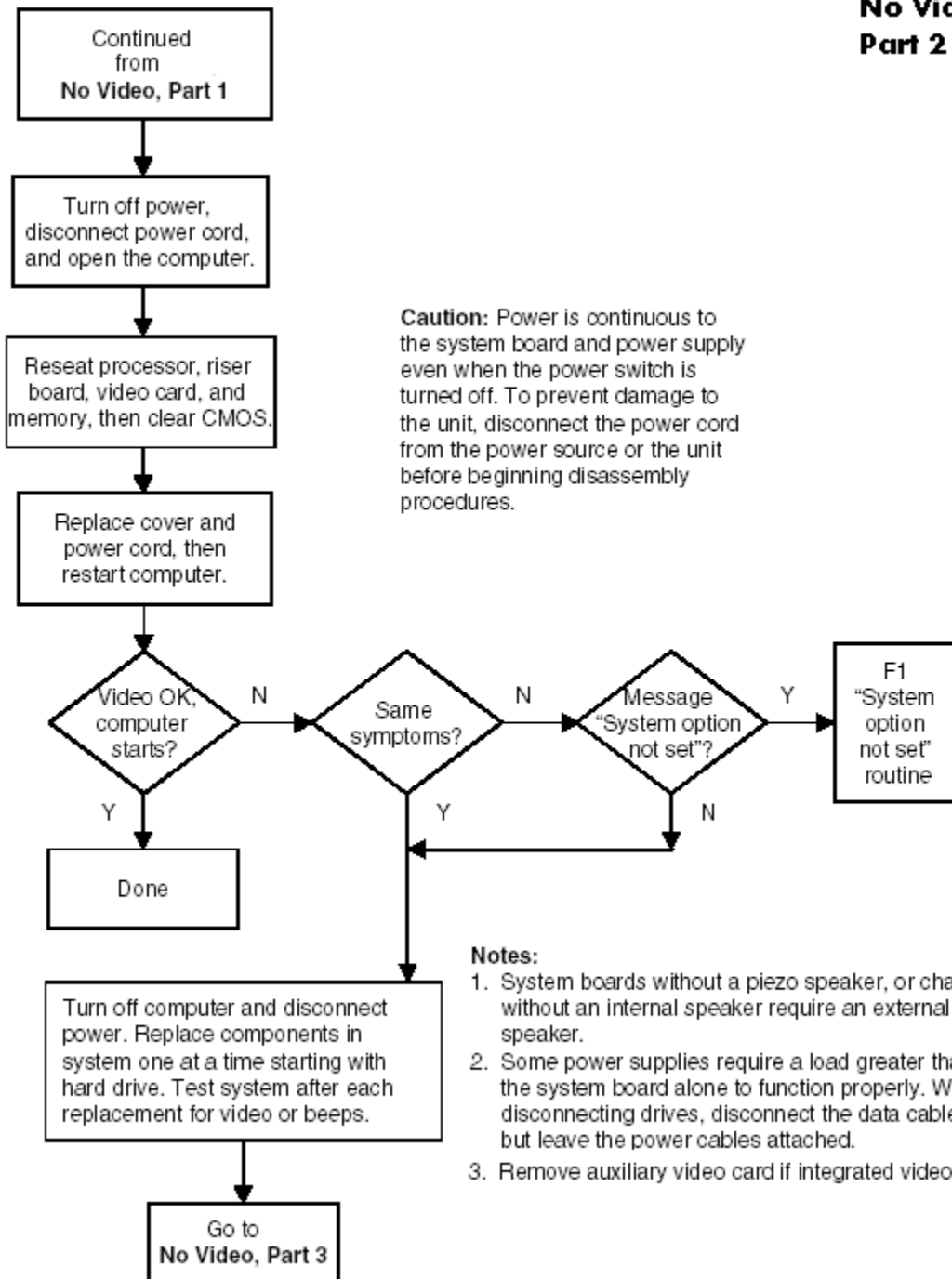


No Video

No Video Part 1



**No Video
Part 2**

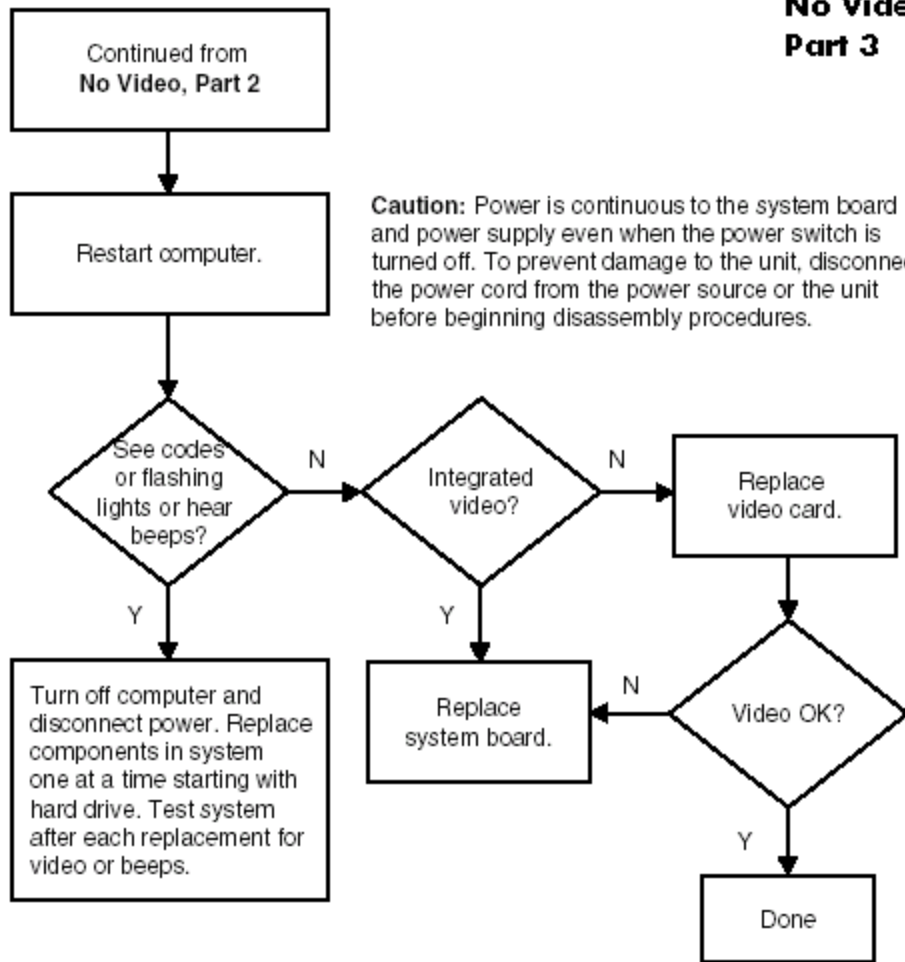


Caution: Power is continuous to the system board and power supply even when the power switch is turned off. To prevent damage to the unit, disconnect the power cord from the power source or the unit before beginning disassembly procedures.

Notes:

1. System boards without a piezo speaker, or chassis without an internal speaker require an external speaker.
2. Some power supplies require a load greater than the system board alone to function properly. When disconnecting drives, disconnect the data cables but leave the power cables attached.
3. Remove auxiliary video card if integrated video.

No Video Part 3



Error Messages

Error Messages Part 1

Beeps,
CPU or Keyboard Lights,
or POST error messages.

Caution: Power is continuous to the system board and power supply even when the power switch is turned off. To prevent damage to the unit, disconnect the power cord from the power source or the unit before beginning disassembly procedures.

- Power LED has no color showing. Computer is off.
- Power LED glows green. Computer is on.
- Power LED blinks green 1x/second. Normal suspend mode.
- Power LED glows red. CPU not installed/fetching code.
- Power LED blinks red 4x/second. CPU thermal shutdown.
- Power LED blinks red 1x/two or more seconds. Power supply crow bar.
- Power and hard drive LEDs glow red. Riser board not seated.
- Num Lock LED flashing green. Memory error.
- Caps Lock LED flashing green. No video.
- Scroll Lock LED flashing green. System board failure, prior to video.
- Audible. 1L 3S. System ROM is bad; system is running in FailSafe Boot Block Mode.
- Audible. 2S. Power-ON successful.
- Continued on **Error Messages, Part 2.**

Notes: Short (S) and long (L) beeps will only be heard if the system has a speaker.
LEDs will only function on PS/2 keyboards, not USB.

Error Messages Part 2

Continued from
Error Messages, Part 1

Caution: Power is continuous to the system board and power supply even when the power switch is turned off. To prevent damage to the unit, disconnect the power cord from the power source or the unit before beginning disassembly procedures.

1S 2L. Num Lock blinking. System memory not present or incompatible. Unplug, open computer, and check memory modules. Ensure memory modules are correct type and that they match in size and speed.

1L 2S. Cap Lock blinking. Video controller not present or incorrectly initialized. Ensure monitor is plugged in. Unplug, open computer, and check video card. Reseat card and ensure it is in the proper expansion slot.

1L 3S. All keyboard LEDs blinking. ROM Failure. Create ROM diskette and reload ROM. Download ROMPaq from HP website at www.hp.com.

2L 1S. Scroll Lock blinking. System HW failure prior to video. Unplug, open computer, and check for physical damage. Ensure all cables and cards are seated. Look for burn marks or smoke.

No beeps. HD and Power LED blinking. Riser not detected. Unplug, open computer, and check and reseat riser board.

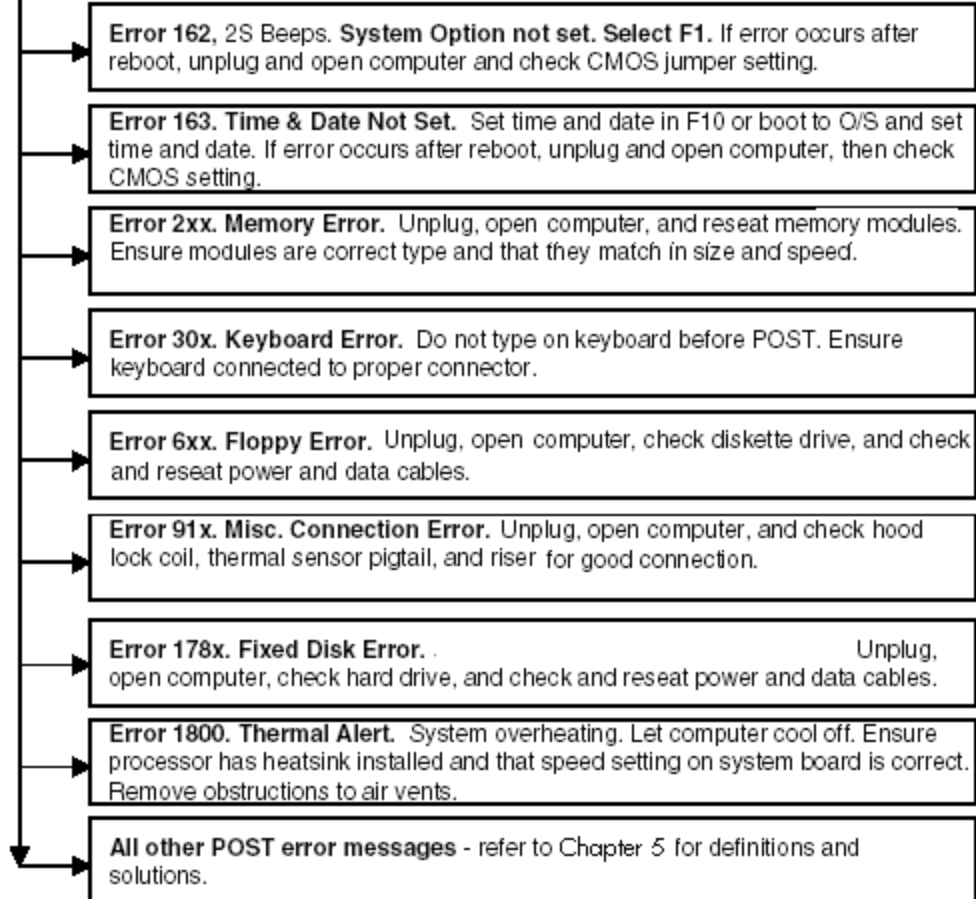
Continued on **Error Messages, Part 3.**

Notes: Short (S) and long (L) beeps will only be heard if the system has a speaker.
LEDs will only function on PS/2 keyboards, not USB.

Error Messages Part 3

Continued from
Error Messages, Part 2

Caution: Power is continuous to the system board and power supply even when the power switch is turned off. To prevent damage to the unit, disconnect the power cord from the power source or the unit before beginning disassembly procedures.

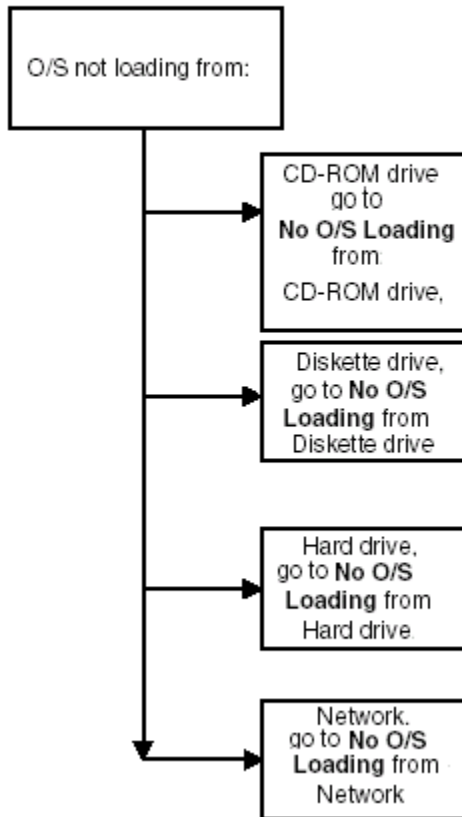


Notes: Short (S) and long (L) beeps will only be heard if the system has a speaker.
LEDs will only function on PS/2 keyboards, not USB.

x = Numbers 1 - 9

No OS Loading

No OS Loading

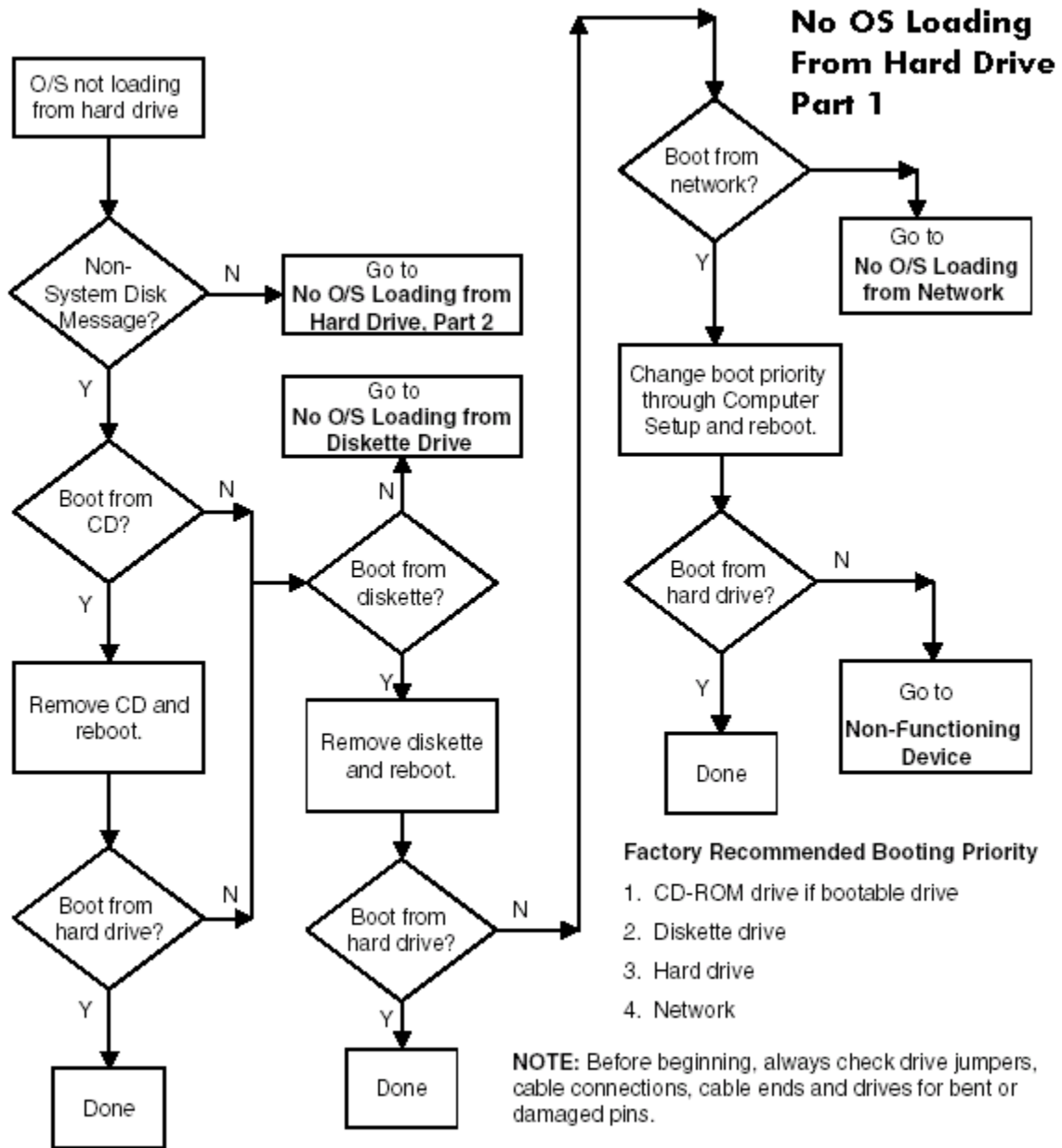


Factory recommended booting priority

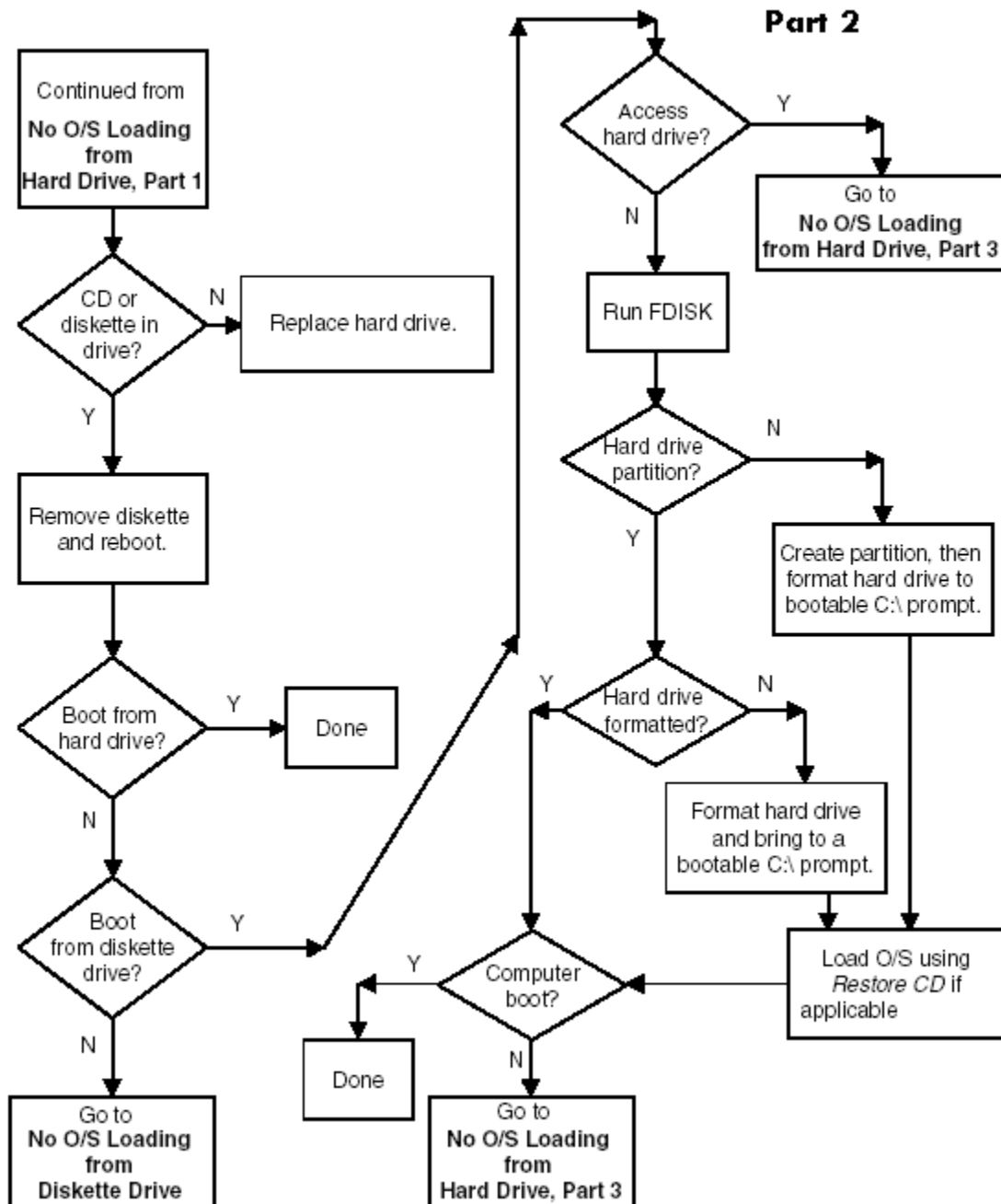
1. CD-ROM drive
2. Diskette drive
3. Hard drive
4. Network

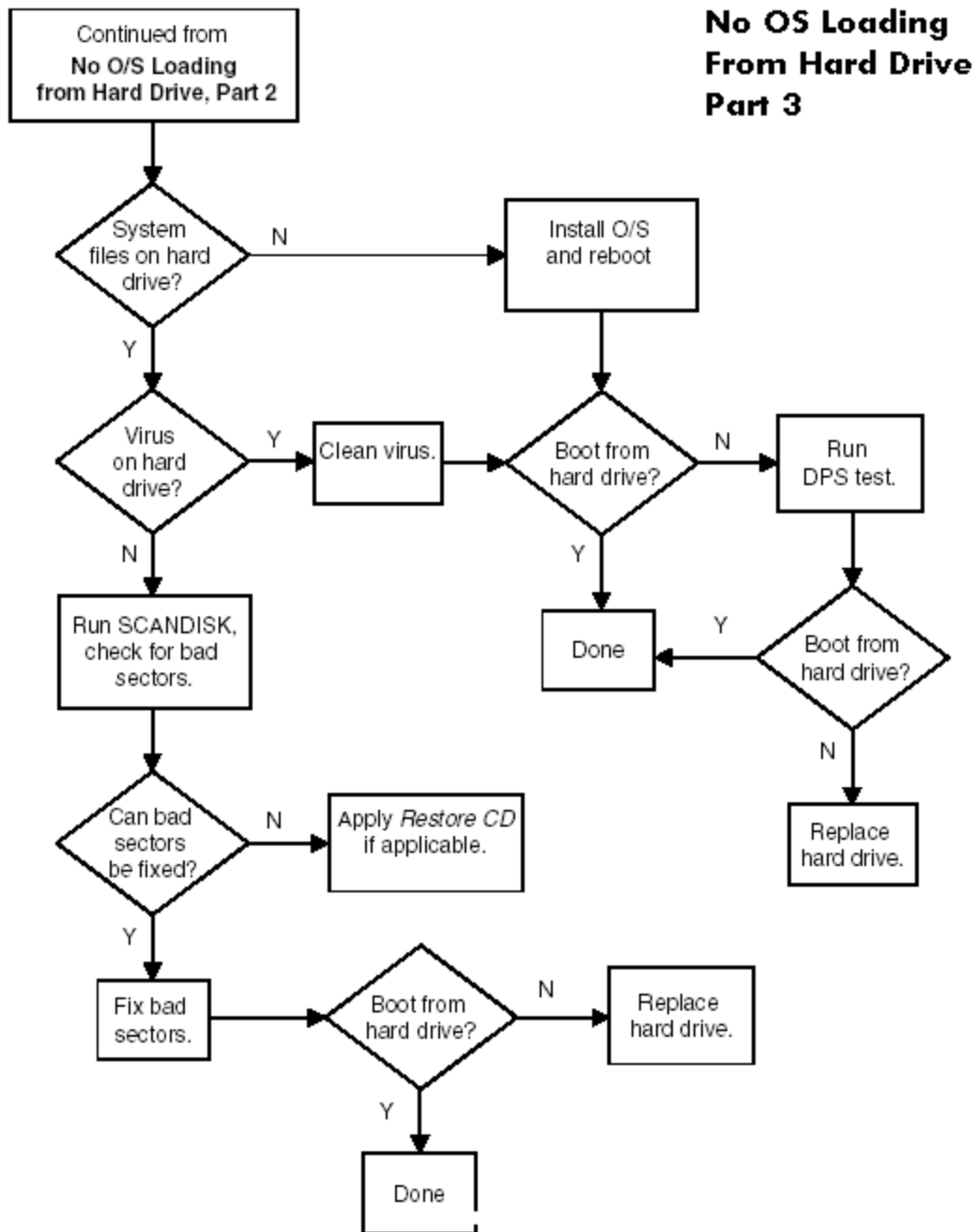
NOTE: Before beginning, always check drive jumpers, cable connections, cable ends, and drives for bent or damaged pins.

No OS Loading from Hard Drive

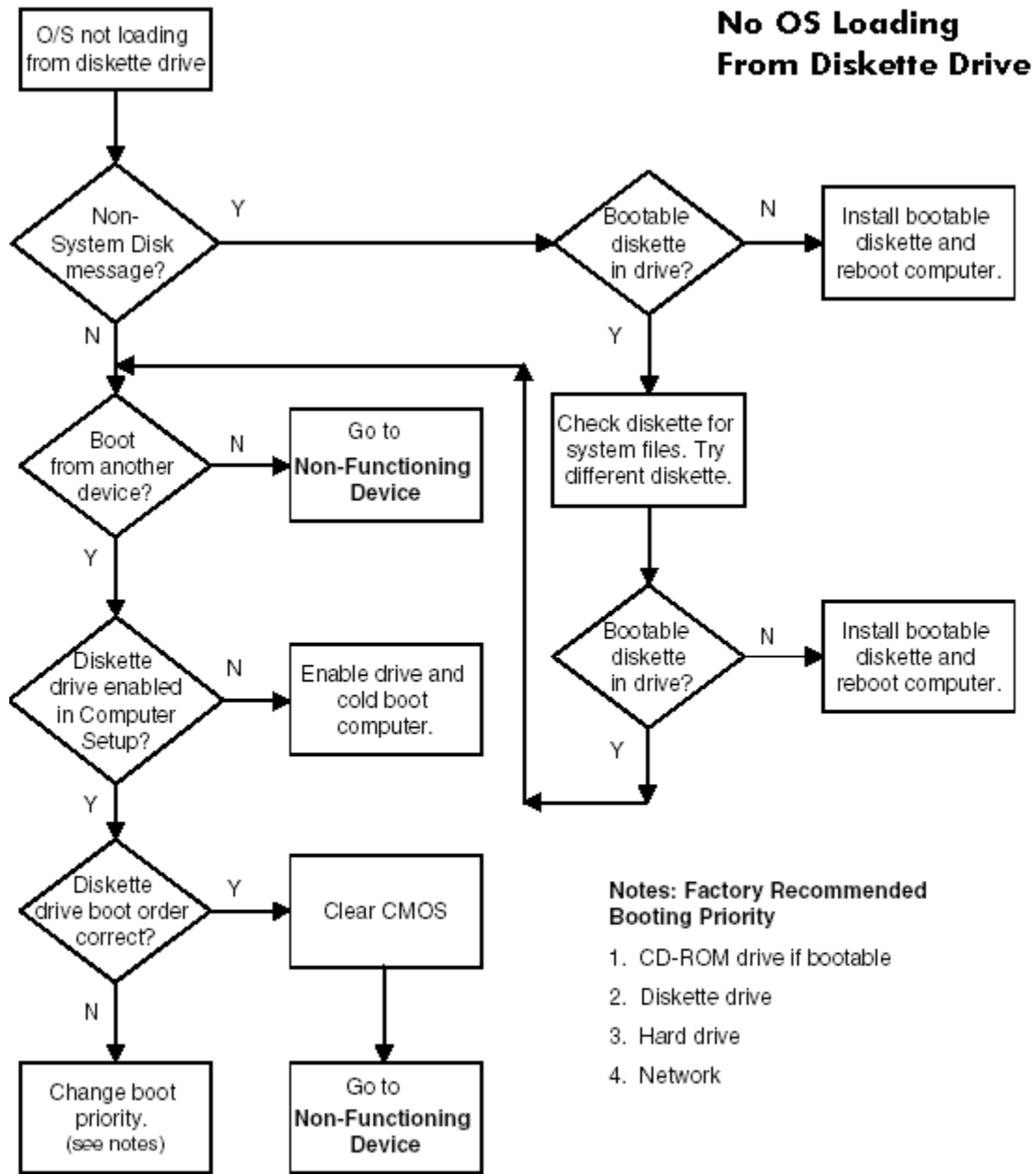


No OS Loading From Hard Drive Part 2

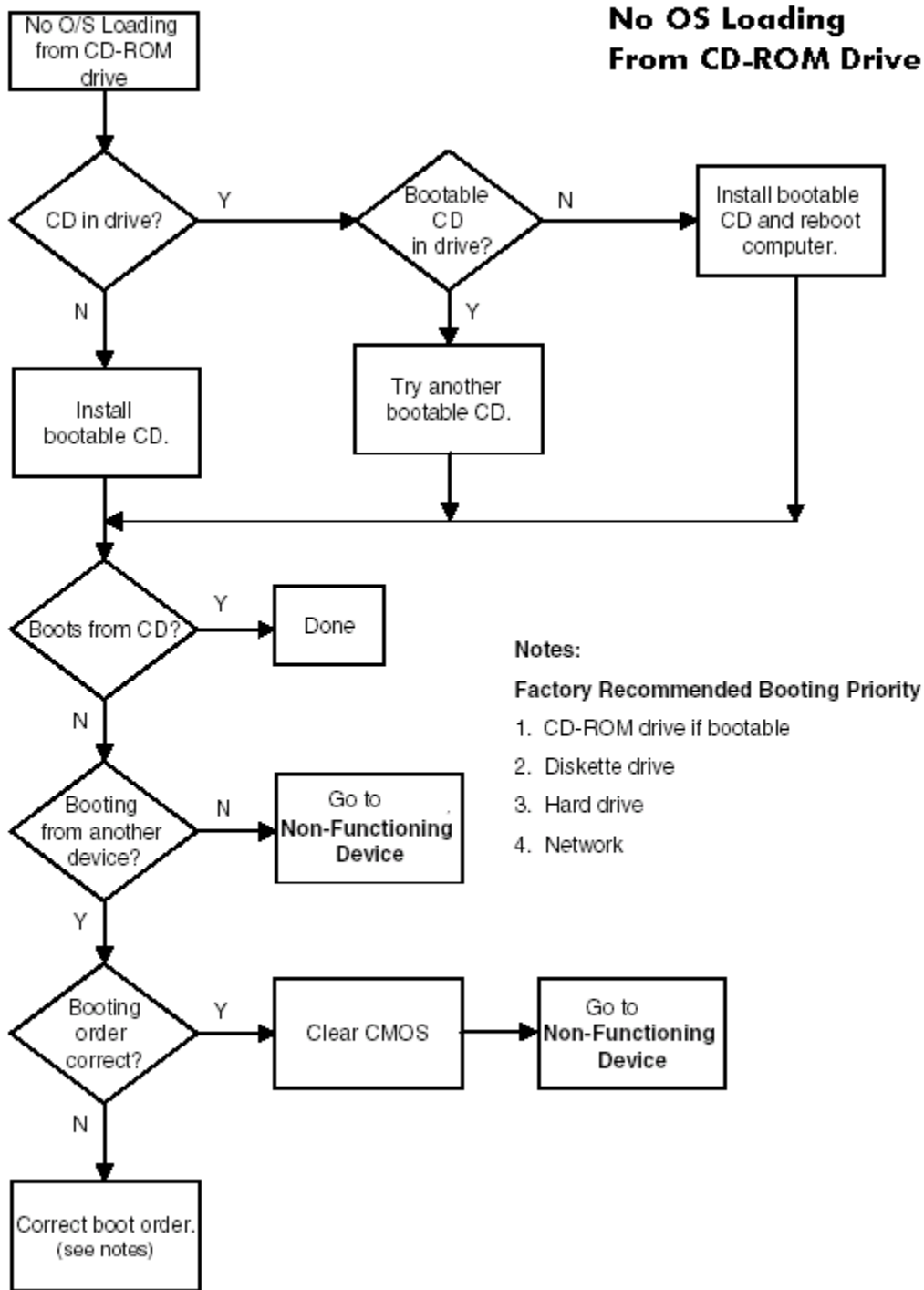




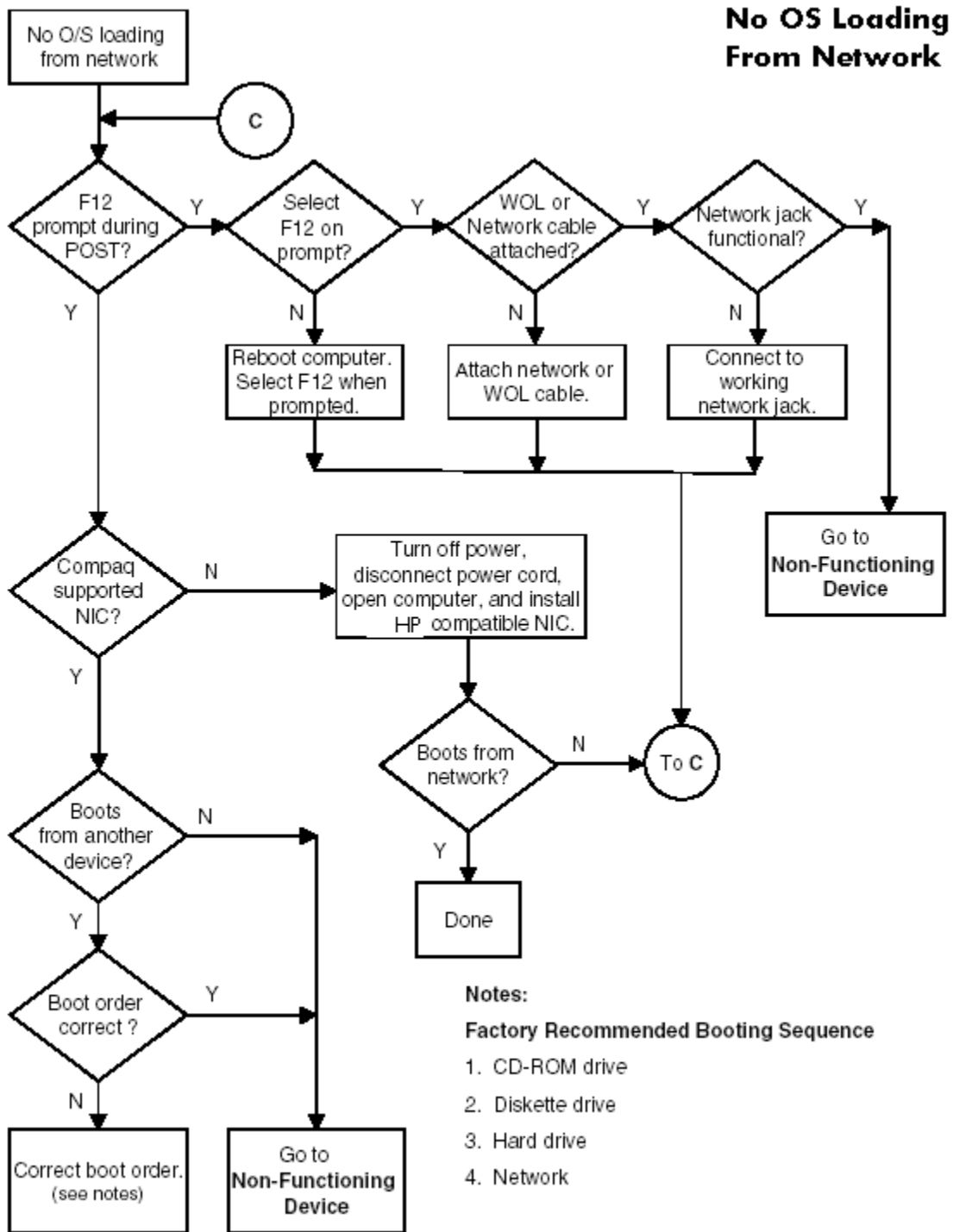
No OS Loading from Diskette Drive



No OS Loading from CD-ROM Drive



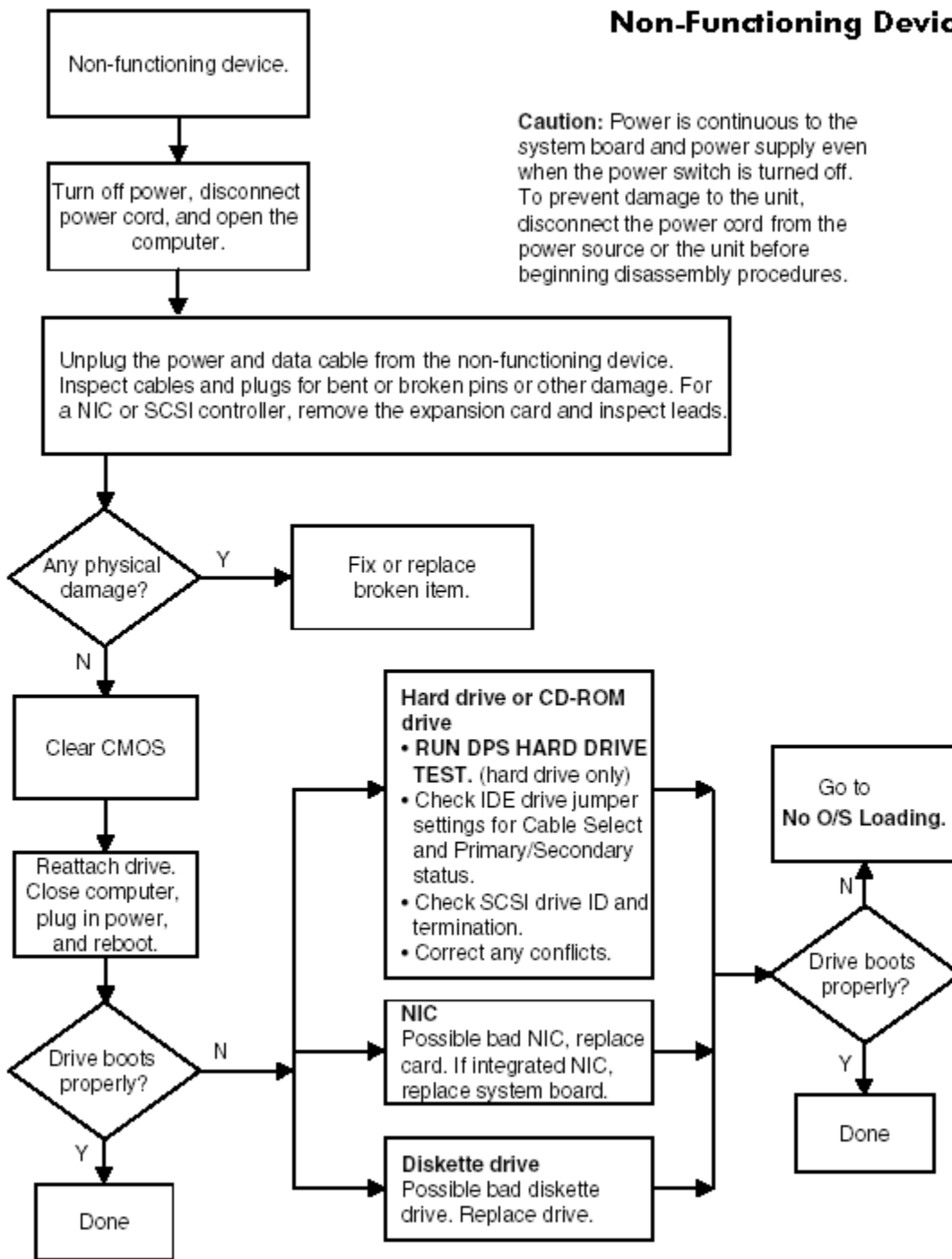
No OS Loading from Network



Non-Functioning Device

Non-Functioning Device

Caution: Power is continuous to the system board and power supply even when the power switch is turned off. To prevent damage to the unit, disconnect the power cord from the power source or the unit before beginning disassembly procedures.



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