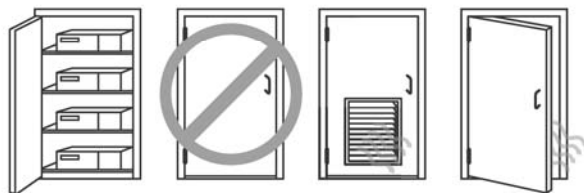
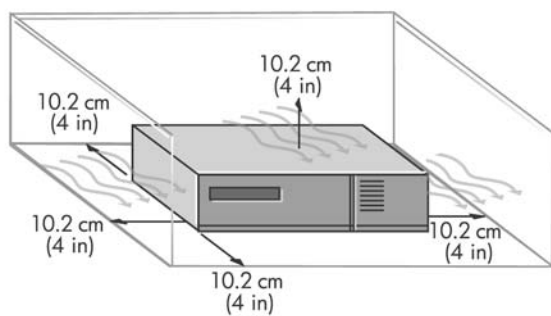
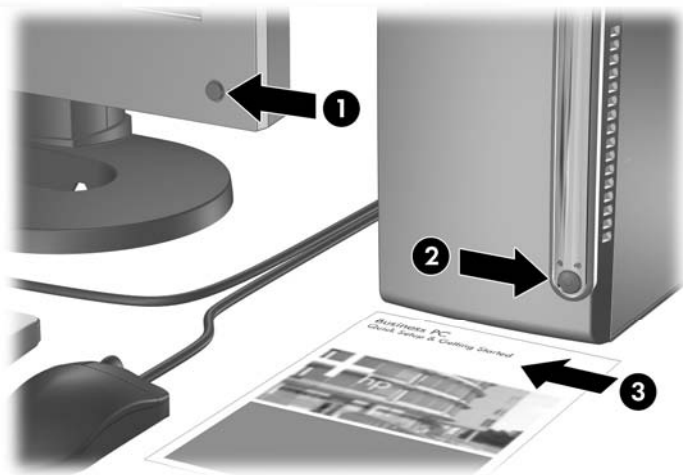




# 4



# Quick Setup & Getting Started

Enhanced For Accessibility

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Business PCs



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Quick Setup & Getting Started

Business PCs

First Edition (August 2006)

Second Edition (January 2007)

Document Part Number: 418296-002

## About This Book

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**WARNING!** Text set off in this manner indicates that failure to follow directions could result in bodily harm or loss of life.

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**CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

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**NOTE:** Text set off in this manner provides important supplemental information.

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# Quick Setup & Getting Started

## Installing and Customizing the Software



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**NOTE:** If the computer was shipped with Microsoft Windows Vista loaded, you will be prompted to register the computer with HP Total Care before installing the operating system. You will see a brief movie followed by an online registration form. Fill out the form, click the **Begin** button, and follow the instructions on the screen.

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**CAUTION:** Do not add optional hardware or third-party devices to the computer until the operating system is successfully installed. Doing so may cause errors and prevent the operating system from installing properly.

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**NOTE:** Be sure there is a 10.2-cm (4-inch) clearance at the back of the unit and above the monitor to permit the required airflow.

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## Installing the Operating System

The first time you turn on the computer, the operating system is installed automatically. This process takes about 5 to 10 minutes, depending on which operating system is being installed. Carefully read and follow the instructions on the screen to complete the installation.



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**CAUTION:** Once the automatic installation has begun, **DO NOT TURN OFF THE COMPUTER UNTIL THE PROCESS IS COMPLETE.** Turning off the computer during the installation process may damage the software that runs the computer or prevent its proper installation.

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**NOTE:** If the computer shipped with more than one operating system language on the hard drive, the installation process could take up to 60 minutes.

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If your computer was not shipped with a Microsoft operating system, some portions of this documentation do not apply. Additional information is available in online help after you install the operating system.

## Downloading Microsoft Windows Updates

1. To set up your Internet connection, click **Start > Internet Explorer** and follow the instructions on the screen.
2. Once an Internet connection has been established, click the **Start** button.
3. Select the **All Programs** menu.
4. Click on the **Windows Update** link.

In Microsoft Windows XP, you will be directed to the **Microsoft Windows Update Web site**. If you see one or more pop-up windows that ask you to install a program from [www.microsoft.com](http://www.microsoft.com), click **Yes** to install the program. Follow the instructions on the Microsoft Web site to scan for updates and install critical updates and service packs.

In Microsoft Windows Vista, the **Windows Update** screen appears. Click **view available updates** and make sure all critical updates are selected. Click the **Install** button and follow the instructions on the screen.

It is recommended that you install all of the critical updates and service packs.

5. After the updates have been installed, Windows will prompt you to reboot the machine. Be sure to save any files or documents that you may have open before rebooting. Then select **Yes** to reboot the machine.

## Installing or Upgrading Device Drivers

When installing optional hardware devices after the operating system installation is complete, you must also install the drivers for each of the devices.

If prompted for the i386 directory, replace the path specification with `C:\i386`, or use the **Browse** button in the dialog box to locate the i386 folder. This action points the operating system to the appropriate drivers.

Obtain the latest support software, including support software for the operating system from [www.hp.com/support](http://www.hp.com/support). Select your country and language, select **Download drivers and software**, enter the model number of the computer, and press **Enter**.

## Customizing the Monitor Display

If you wish, you can select or change the monitor model, refresh rates, screen resolution, color settings, font sizes, and power management settings. To do so, right-click on the Windows Desktop, then click **Properties** in Microsoft Windows XP or **Personalize** in Microsoft Windows Vista to change display settings. For more information, refer to the online documentation provided with the graphics controller utility or the documentation that came with your monitor.

## Protecting the Software

To protect the software from loss or damage, 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 your data files.

## HP Backup and Recovery Manager



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**NOTE:** The features described below are only available on systems shipped with Microsoft Windows XP. The HP Backup and Recovery Manager included with Microsoft Windows Vista is a more limited version. Check for updates by clicking the **Software & Driver Downloads** link at <http://www.hp.com>.

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The HP Backup and Recovery Manager is an easy-to-use, versatile application that is pre-loaded on each system and allows you to:

- create Recovery Points to back up the entire system incrementally
- back up the entire system in a single hard archive
- back up individual files

Backups can be scheduled to occur automatically at designated intervals, or they can be initiated manually. Recovery can be performed from the Recovery Partition on the hard drive or the Recovery Disc Set. The Recovery Disc Set includes the *Restore Plus!* CD, the Microsoft Operating System, and any Supplemental Software CDs.



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**NOTE:** HP highly recommends that you create a Recovery Disc Set immediately before using the computer and schedule regular automatic Recovery Point backups.

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To create the Recovery Disc Set:

1. Click **Start > HP Backup and Recovery > HP Backup and Recovery Manager** to open the Backup and Recovery Wizard, then click **Next**.
2. Select **Create factory software recovery CDs or DVDs to recover the system**.
3. Follow the instructions in the wizard.

The HP Backup and Recovery Manager provides two basic recovery methods. The first, recovery of files and folders, operates in Windows. The second, PC Recovery, requires a reboot to the Recovery Partition or from the Recovery Disc Set. To reboot to the Recovery Partition, press F11 at startup when you see the message “Press F11 for Emergency Recovery.”



**NOTE:** For more information on using HP Backup and Recovery Manager, refer to the *HP Backup and Recovery Manager User Guide* by selecting **Start > HP Backup and Recovery > HP Backup and Recovery Manager Manual**.

You can order a Recovery Disc Set from HP by calling the HP support center. Go to the following Web site, select your region, and click the **Technical support after you buy** link under the **Call HP** heading to obtain the support center telephone number for your region.

[http://welcome.hp.com/country/us/en/wwcontact\\_us.html](http://welcome.hp.com/country/us/en/wwcontact_us.html)

## Turning Off the Computer

To properly turn off the computer, first shut down the operating system software. In Microsoft Windows XP Professional, click **Start > Shut Down**. In Microsoft Windows XP Home, click **Start > Turn Off Computer**. In Microsoft Windows Vista, click **Start**, click the arrow on the lower right corner of the Start menu, then select **Shut Down**. The computer automatically shuts down.

Depending on the operating system, pressing the power button may cause the computer to enter a low-power or “standby” state instead of automatically turning the power off. This allows you to conserve energy without closing software applications; later, you can start using the computer immediately without having to restart the operating system and without losing any data.



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**CAUTION:** Manually forcing the computer off will cause the loss of any unsaved data.

---

To force the computer off manually and bypass the “standby state,” press and hold the power button for four seconds.

On some models, you can reconfigure the power button to work in On/Off mode by running Computer Setup. Refer to the *Computer Setup (F10) Utility Guide* on the *Documentation and Diagnostics CD* for more information about using the Computer Setup utility.

## Finding More Information

The following publications are available on the *Documentation and Diagnostics CD*:

- *Quick Setup & Getting Started* (available in print and Adobe Acrobat PDF on the CD) Helps you connect the computer and peripheral devices and set up factory-provided software; also includes basic troubleshooting information should you encounter any problems during initial startup.
- *Hardware Reference Guide* (PDF on the CD) Provides an overview of the product hardware, as well as instructions for upgrading this series of computers; includes information on RTC batteries, memory, and power supply.
- *Computer Setup (F10) Utility Guide* (PDF on the CD) Provides instructions on using this tool to reconfigure or modify default settings for maintenance purposes or when installing new hardware devices.
- *Desktop Management Guide* (PDF on the CD) Provides definitions and “how to” instructions for security and Intelligent Manageability features that are preinstalled on some models.
- *Network & Internet Communications Guide* (PDF on the CD) Provides basic networking information and instructions for installing device drivers and using network interface controller (NIC) features preinstalled on some desktop models; also provides information about Internet Service Providers and using the Internet.
- *Troubleshooting Guide* (PDF on the CD) A comprehensive guide that provides helpful hints for troubleshooting this computer and scenarios for resolving possible hardware or software problems; includes

information about diagnostic codes, as well as information on running the diagnostics utility.

- *Safety & Regulatory Information Guide* (PDF on the CD) Provides safety and regulatory information that ensures compliance with U.S., Canadian, and various international regulations.



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**NOTE:** If you do not have an optical drive capable of reading CDs, you may download the product documentation from the Web at <http://www.hp.com/support>. Select your country and language, select **See support and troubleshooting information**, enter the model number of the computer, and press **Enter**.

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## Using the *Documentation and Diagnostics CD*

1. Insert the CD into the optical drive.

There may be a slight delay while the software on the CD checks the Windows Regional Settings.

2. Read and follow the prompts to complete the installation.

The menu and books are displayed in the language chosen during initial system setup or as specified later in the Windows Regional Settings. If the Regional Settings do not match one of the languages supported on the CD, the menu and books are displayed in English.

3. Click the title of the book you want to read.

If there is no optical drive activity for two minutes or more, it may be that Autorun is not enabled on the computer.

To run the *Documentation and Diagnostics CD* if it does not run automatically:

1. In Microsoft Windows XP, click **Start > Run**. In Microsoft Windows Vista, click **Start > All Programs > Accessories > Run**.
2. Type:  
`X:\DocLib.exe`  
(where x is the drive letter designator for the optical drive)
3. Click **OK**.

If the computer is running a Linux operating system, the *Documentation and Diagnostics CD* will not autorun. To view the documents on the CD, download and install Adobe Acrobat Reader for Linux from [www.adobe.com](http://www.adobe.com).

## Before You Call for Technical Support

If you are having problems with the computer, try the appropriate solutions below to try to isolate the exact problem before calling for technical support.

- Run the diagnostics utility. Refer to the *Troubleshooting Guide* on the *Documentation and Diagnostics CD* for more information.
- Run the Drive Protection System (DPS) Self-Test in Computer Setup. Refer to the *Computer Setup (F10) Utility Guide* on the *Documentation and Diagnostics CD* for more information.



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**NOTE:** The Drive Protection System (DPS) Self-Test software is available on some models only.

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- Check the power LED on the front of the computer to see if it is flashing red. The flashing lights are error codes that will help you diagnose the problem. Refer to [Interpreting POST Diagnostic Front Panel LEDs and Audible Codes on page 18](#) in this guide for details.
- If the screen is blank, plug the monitor into a different video port on the computer if one is available. Or, change out the monitor with a monitor that you know is working properly.
- If you are working on a network, plug another computer with a different cable into the network connection. There may be a problem with the network plug or cable.
- If you recently added new hardware, remove the hardware and see if the computer functions properly.
- If you recently installed new software, uninstall the software and see if the computer functions properly.
- Boot the computer to the Safe Mode to see if it will boot without all of the drivers loaded. When booting the operating system, use “Last Known Configuration.”
- Refer to the comprehensive online technical support at [www.hp.com/support](http://www.hp.com/support).

- Refer to [Helpful Hints on page 9](#) in this guide for more general suggestions.
- Refer to the comprehensive *Troubleshooting Guide* on the *Documentation and Diagnostics CD* for more detailed information.
- Run the *Restore Plus* CD to restore the original operating system and factory-installed software.



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**CAUTION:** Running the *Restore Plus* will erase all data on the hard drive.

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To assist you in resolving problems online, HP Instant Support Professional Edition provides you with self-solve diagnostics. If you need to contact HP support, use HP Instant Support Professional Edition's online chat feature. Access HP Instant Support Professional Edition at: [www.hp.com/go/ispe](http://www.hp.com/go/ispe).

Access the Business Support Center (BSC) at [www.hp.com/go/bizsupport](http://www.hp.com/go/bizsupport) for the latest online support information, software and drivers, proactive notification, and worldwide community of peers and HP experts.

If it becomes necessary to call for technical assistance, be prepared to do the following to ensure that your service call is handled properly:

- Be in front of your computer when you call.
- Write down the computer serial number and product ID number, and the monitor serial number before calling.
- Spend time troubleshooting the problem with the service technician.
- Remove any hardware that was recently added to your system.
- Remove any software that was recently installed.
- Run the *Restore Plus* CD.



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**CAUTION:** Running the *Restore Plus* CD will erase all data on the hard drive.

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**NOTE:** For sales information and warranty upgrades (HP Care Pack), call an authorized service provider or dealer.

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## Helpful Hints

If you encounter problems with the computer, monitor, or software, see the following list of general suggestions before taking further action:

- Check that the computer and monitor are plugged into a working electrical outlet.
- Check to see that the voltage select switch (some models) is set to the appropriate voltage for your region (115V or 230V).
- Check to see that the computer is turned on and the green power light is on.
- Check to see that the monitor is turned on and the green monitor light is on.
- Check the power LED on the front of the computer to see if it is flashing. The flashing lights are error codes that will help you diagnose the problem. Refer to [Interpreting POST Diagnostic Front Panel LEDs and Audible Codes on page 18](#) in this guide for details.
- Turn up the brightness and contrast controls of the monitor if the monitor is dim.
- Press and hold any key. If the system beeps, then the keyboard should be operating correctly.
- Check all cable connections for loose connections or incorrect connections.
- Wake the computer by pressing any key on the keyboard or pressing the power button. If the system remains in suspend mode for more than four seconds, shut down the computer by pressing and holding the power button for at least four seconds then press the power button again to restart the computer. If the system will not shut down, unplug the power cord, wait a few seconds, then plug it in again. The computer will restart if automatic start on power loss is set in Computer Setup. If it does not restart, press the power button to start the computer.
- Reconfigure your computer after installing a non–plug and play expansion board or other option. See [Solving Hardware Installation Problems on page 15](#) for instructions.

- Be sure that all the needed device drivers have been installed. For example, if you are using a printer, you need a driver for that model printer.
- Remove all bootable media (diskette, CD, or USB device) from the system before turning it on.
- If you have installed an operating system other than the factory-installed operating system, check to be sure that it is supported on the system.
- If the system has multiple video sources (embedded, PCI, or PCI-Express adapters) installed (embedded video on some models only) and a single monitor, the monitor must be plugged into the monitor connector on the source selected as the primary VGA adapter. During boot, the other monitor connectors are disabled and if the monitor is connected into these ports, the monitor will not function. You can select which source will be the default VGA source in Computer Setup.



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**CAUTION:** When the computer is plugged into an AC power source, there is always voltage applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

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## Basic Troubleshooting

This section concentrates on problems that you might encounter during the initial set up process. A comprehensive *Troubleshooting Guide* is available on the *Documentation and Diagnostics CD* and under the reference library at <http://www.hp.com/support>. Select your country and language, select **See support and troubleshooting information**, enter the model number of the computer, and press **Enter**.

## Solving General Problems

You may be able to easily resolve the general problems described in this section. If a problem persists and you are unable to resolve it yourself or if you feel uncomfortable about performing the operation, contact an authorized dealer or reseller.



**WARNING!** When the computer is plugged into an AC power source, voltage is always applied to the system board. To reduce the risk of personal injury from electrical shock and/or hot surfaces, be sure to disconnect the power cord from the wall outlet and allow the internal system components to cool before touching.


Look for the LED between the DIMM sockets. If the LED is illuminated, the system still has power. Power off the computer and remove the power cord before proceeding.

**Table 1 Solving General Problems**

**Computer appears locked up and will not turn off when the power button is pressed.**

Cause	Solution
Software control of the power switch is not functional.	<ol style="list-style-type: none"><li>1. Press and hold the power button for at least four seconds until the computer turns off.</li><li>2. Disconnect the power cord from the electrical outlet.</li></ol>

**Computer will not respond to USB keyboard or mouse.**

Cause	Solution
Computer is in <b>standby</b> mode.	To resume from <b>standby</b> mode, press the power button or press any key.   <b>CAUTION:</b> When attempting to resume from <b>standby</b> mode, do not hold down the power button for more than four seconds. Otherwise, the computer will shut down and you will lose any unsaved data.


System has locked up.	Restart computer.
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**Computer date and time display is incorrect.**

Cause	Solution
RTC (real-time clock) battery may need to be replaced.	First, reset the date and time under <b>Control Panel</b> (Computer Setup can also be used to update the RTC date and time). If the problem persists, replace the RTC battery. See the

**Table 1 Solving General Problems (continued)**

**Computer date and time display is incorrect.**

Cause	Solution
 <b>NOTE:</b> Connecting the computer to a live AC outlet prolongs the life of the RTC battery.	<i>Hardware Reference Guide</i> on the <i>Documentation and Diagnostics CD</i> for instructions on installing a new battery, or contact an authorized dealer or reseller for RTC battery replacement.

**Cursor will not move using the arrow keys on the keypad.**

Cause	Solution
The <b>Num Lock</b> key may be on.	Press the <b>Num Lock</b> key. The Num Lock light should not be on if you want to use the <b>arrow</b> keys. The <b>Num Lock</b> key can be disabled (or enabled) in Computer Setup.

**There is no sound or sound volume is too low.**

Cause	Solution
System volume may be set low or muted.	<ol style="list-style-type: none"><li>1. Check the F10 BIOS settings to make sure the internal system speaker is not muted (this setting does not affect the external speakers).</li><li>2. Make sure the external speakers are properly connected and powered on and that the speakers' volume control is set correctly.</li><li>3. Use the system volume control available in the operating system to make sure the speakers are not muted or to increase the volume.</li></ol>

**Cannot remove computer cover or access panel.**

Cause	Solution
Smart Cover Lock, featured on some computers, is locked.	Unlock the Smart Cover Lock using Computer Setup.  The Smart Cover FailSafe Key, a device for manually disabling the Smart Cover Lock, is available from HP. You will need the FailSafe Key in case of forgotten password, power loss, or computer malfunction. Order PN 166527-001 for

**Table 1 Solving General Problems (continued)****Cannot remove computer cover or access panel.**

<b>Cause</b>	<b>Solution</b>
	the wrench-style key or PN 166527-002 for the screwdriver bit key.

**Poor performance is experienced.**

<b>Cause</b>	<b>Solution</b>
Processor is hot.	<ol style="list-style-type: none"><li>1. Make sure airflow to the computer is not blocked. Leave a 10.2-cm (4-inch) clearance on all vented sides of the computer and above the monitor to permit the required airflow</li><li>2. Make sure fans are connected and working properly (some fans only operate when needed).</li><li>3. Make sure the processor heatsink is installed properly.</li></ol>
Hard drive is full.	Transfer data from the hard drive to create more space on the hard drive.
Low on memory.	Add more memory.
Hard drive fragmented.	Defragment hard drive.
Program previously accessed did not release reserved memory back to the system.	Restart the computer.
Virus resident on the hard drive.	Run virus protection program.
Too many applications running.	<ol style="list-style-type: none"><li>1. Close unnecessary applications to free up memory.</li><li>2. Add more memory.</li></ol>
Some software applications, especially games, are stressful on the graphics subsystem	<ol style="list-style-type: none"><li>1. Lower the display resolution for the current application or consult the documentation that came with the application for suggestions on how to improve performance by adjusting parameters in the application.</li><li>2. Add more memory.</li><li>3. Upgrade the graphics solution.</li></ol>
Cause unknown.	Restart the computer.

## Table 1 Solving General Problems (continued)

Computer powered off automatically and the Power LED flashes Red two times, once every second, followed by a two second pause, and the computer beeps two times. (Beeps stop after fifth iteration but LEDs continue flashing).

Cause	Solution
Processor thermal protection activated: A fan may be blocked or not turning.  OR  The heatsink is not properly attached to the processor.	<ol style="list-style-type: none"><li>1. Ensure that the computer air vents are not blocked and the processor cooling fan is running.</li><li>2. Open hood, press 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.</li><li>3. If fan is plugged in, but is not spinning, then replace the heatsink/fan assembly.</li><li>4. Contact an authorized reseller or service provider.</li></ol>

System does not power on and the LEDs on the front of the computer are not flashing.

Cause	Solution
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"><li>1. Check that the voltage selector, located on the rear of the power supply on some models, is set to the appropriate voltage. Proper voltage setting depends on your region.</li><li>2. Remove the expansion cards one at a time until the 5V_aux light on the system board turns on.</li><li>3. Replace the system board.</li></ol> <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"><li>1. Check that the unit is plugged into a working AC outlet.</li><li>2. Open hood and check that the power button harness is properly connected to the system board.</li><li>3. Check that both power supply cables are properly connected to the system board.</li></ol>

**Table 1 Solving General Problems (continued)**

System does not power on and the LEDs on the front of the computer are not flashing.

Cause	Solution
	4. Check to see if the 5V_aux light on the system board is turned on. If it is turned on, then replace the power button harness.
	5. If the 5V_aux light on the system board is off, then replace the power supply.
	6. Replace the system board.

## Solving Hardware Installation Problems

You may need to reconfigure the computer when you add or remove hardware, such as an additional drive or expansion card. If you install a plug and play device, Windows automatically recognizes the device and configures the computer. If you install a non–plug and play device, you must reconfigure the computer after completing installation of the new hardware. In Windows, use the **Add Hardware Wizard** and follow the instructions that appear on the screen.



**WARNING!** When the computer is plugged into an AC power source, voltage is always applied to the system board. To reduce the risk of personal injury from electrical shock and/or hot surfaces, be sure to disconnect the power cord from the wall outlet and allow the internal system components to cool before touching.

Look for the LED between the DIMM sockets. If the LED is illuminated, the system still has power. Power off the computer and remove the power cord before proceeding.

**Table 2 Solving Hardware Installation Problems**

A new device is not recognized as part of the system.


Cause	Solution
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.
Cable(s) of new external device are loose or power cables are unplugged.	Ensure that all cables are properly and securely connected and that pins in the cable or connector are not bent down.

## Table 2 Solving Hardware Installation Problems (continued)

### A new device is not recognized as part of the system.

Cause	Solution
Power switch of new external device is not turned on.	Turn off the computer, turn on the external device, then turn on the computer to integrate the device with the computer system.
When the system advised you of changes to the configuration, you did not accept them.	Reboot the computer and follow the instructions for accepting the changes.
A plug and play board may not automatically configure when added if the default configuration conflicts with other devices.	Use Windows 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.
USB ports on the computer are disabled in Computer Setup.	Enter Computer Setup (F10) and enable the USB ports.



### Computer will not start.

Cause	Solution
Wrong memory modules were used in the upgrade or memory modules were installed in the wrong location.	<ol style="list-style-type: none"><li>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.  <b>NOTE:</b> DIMM 1 must always be installed.</li><li>2. Observe the beeps and LED lights on the front of the computer. Beeps and flashing LEDs are codes for specific problems.</li><li>3. If you still cannot resolve the issue, contact Customer Support.</li></ol>



## Table 2 Solving Hardware Installation Problems (continued)

Power LED flashes Red five times, once every second, followed by a two second pause, and the computer beeps five times. (Beeps stop after fifth iteration but LEDs continue flashing.)

Cause	Solution
Memory is installed incorrectly or is bad.	 <p><b>CAUTION:</b> To avoid damage to the DIMMs or the system board, you must unplug the computer power cord before attempting to reseat, install, or remove a DIMM module.</p> <ol style="list-style-type: none"><li>1. Reseat DIMMs. Power on the system.</li><li>2. Replace DIMMs one at a time to isolate the faulty module.</li></ol> <hr/> <p> <b>NOTE:</b> DIMM 1 must always be installed.</p> <ol style="list-style-type: none"><li>3. Replace third-party memory with HP memory.</li><li>4. Replace the system board.</li></ol>

Power LED flashes Red six times, once every second, followed by a two second pause, and the computer beeps six times. (Beeps stop after fifth iteration but LEDs continue flashing.)

Cause	Solution
Graphics 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"><li>1. Reseat the graphics card. Power on the system.</li><li>2. Replace the graphics card.</li><li>3. Replace the system board.</li></ol> For systems with integrated graphics, replace the system board.

## Table 2 Solving Hardware Installation Problems (continued)

Power LED flashes Red ten times, once every second, followed by a two second pause, and the computer beeps ten times. (Beeps stop after fifth iteration but LEDs continue flashing.)

Cause	Solution
Bad option card.	<ol style="list-style-type: none"><li>1. Check each option card by removing the cards one at time (if multiple cards), then power on the system to see if fault goes away.</li><li>2. Once bad card is identified, remove and replace bad option card.</li><li>3. Replace the system board.</li></ol>

## Interpreting POST Diagnostic Front Panel LEDs and Audible Codes

This section covers the front panel LED codes as well as the audible codes that may occur before or during POST that do not necessarily have an error code or text message associated with them.



**WARNING!** When the computer is plugged into an AC power source, voltage is always applied to the system board. To reduce the risk of personal injury from electrical shock and/or hot surfaces, be sure to disconnect the power cord from the wall outlet and allow the internal system components to cool before touching.

Look for the LED between the DIMM sockets. If the LED is illuminated, the system still has power. Power off the computer and remove the power cord before proceeding.



**NOTE:** If you see flashing LEDs on a PS/2 keyboard, look for flashing LEDs on the front panel of the computer and refer to the following table to determine the front panel LED codes.

Recommended actions in the following table are listed in the order in which they should be performed.

Not all diagnostic lights and audible codes are available on all models.


## Table 3 Diagnostic Front Panel LEDs and Audible Codes

Activity	Beeps	Possible Cause	Recommended Action
Green Power LED On.	None	Computer on.	None

**Table 3 Diagnostic Front Panel LEDs and Audible Codes (continued)**

Activity	Beeps	Possible Cause	Recommended Action
Green Power LED flashes every two seconds.	None	Computer in Suspend to RAM mode (some models only) or normal Suspend mode.	None required. Press any key or move the mouse to wake the computer.
Red Power LED flashes two times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	2	Processor thermal protection activated:  A fan may be blocked or not turning.  OR  The heatsink/fan assembly is not properly attached to the processor.	<ol style="list-style-type: none"><li>1. Ensure that the computer air vents are not blocked and the processor cooling fan is running.</li><li>2. Open hood, press 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.</li><li>3. If fan is plugged in, but is not spinning, then replace heatsink/fan assembly.</li><li>4. Contact an authorized reseller or service provider.</li></ol>
Red Power LED flashes three times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	3	Processor not installed (not an indicator of bad processor).	<ol style="list-style-type: none"><li>1. Check to see that the processor is present.</li><li>2. Reseat the processor.</li></ol>
Red Power LED flashes four times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	4	Power failure (power supply is overloaded).	<ol style="list-style-type: none"><li>1. Open the hood and ensure the 4 or 6-wire power supply cable is seated into the connector on the system board.</li><li>2. Check if a device is causing the problem by removing ALL attached devices (such as hard, diskette, or optical drives, and expansion cards). 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 that is causing the failure. Continue adding devices one at a time to ensure all devices are functioning properly.</li><li>3. Replace the power supply.</li><li>4. Replace the system board.</li></ol>

**Table 3 Diagnostic Front Panel LEDs and Audible Codes (continued)**

Activity	Beeps	Possible Cause	Recommended Action
Red Power LED flashes five times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	5	Pre-video memory error.	 <b>CAUTION:</b> To avoid damage to the DIMMs or the system board, you must unplug the computer power cord before attempting to reset, install, or remove a DIMM module. <ol style="list-style-type: none"><li>1. Reseat DIMMs.</li><li>2. Replace DIMMs one at a time to isolate the faulty module.</li><li>3. Replace third-party memory with HP memory.</li><li>4. Replace the system board.</li></ol>
Red Power LED flashes six times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	6	Pre-video graphics error.	For systems with a graphics card: <ol style="list-style-type: none"><li>1. Reseat the graphics card.</li><li>2. Replace the graphics card.</li><li>3. Replace the system board.</li></ol> For systems with integrated graphics, replace the system board.
Red Power LED flashes seven times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	7	System board failure (ROM detected failure prior to video).	Replace the system board.
Red Power LED flashes eight times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	8	Invalid ROM based on bad checksum.	<ol style="list-style-type: none"><li>1. Reflash the system ROM with the latest BIOS image. See the "Boot Block Emergency Recovery Mode" section of the <i>Desktop Management Guide</i> on the <i>Documentation and Diagnostics CD</i> for more information.</li><li>2. Replace the system board.</li></ol>

**Table 3 Diagnostic Front Panel LEDs and Audible Codes (continued)**

Activity	Beeps	Possible Cause	Recommended Action
Red Power LED flashes nine times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	9	System powers on but is unable to boot.	<ol style="list-style-type: none"><li>1. Check that the voltage selector, located on the rear of the power supply (some models), is set to the appropriate voltage. Proper voltage setting depends on your region.</li><li>2. Replace the system board.</li><li>3. Replace the processor.</li></ol>
Red Power LED flashes ten times, once every second, followed by a two second pause. Beeps stop after fifth iteration but LEDs continue until problem is solved.	10	Bad option card.	<ol style="list-style-type: none"><li>1. Check each option card by removing the card (one at a time if multiple cards), then power on the system to see if fault goes away.</li><li>2. Once a bad card is identified, remove and replace the bad option card.</li><li>3. Replace the system board.</li></ol>
System does not power on and LEDs are not flashing.	None	System unable to power on.	<p>Press and hold the power button for less than 4 seconds. If the hard drive LED turns green, the power button is working correctly. Try the following:</p> <ol style="list-style-type: none"><li>1. Check that the voltage selector (some models), located on the rear of the power supply, is set to the appropriate voltage. Proper voltage setting depends on your region.</li><li>2. Replace the system board.</li></ol> <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"><li>1. Check that the unit is plugged into a working AC outlet.</li><li>2. Open hood and check that the power button harness is properly connected to the system board.</li><li>3. Check that both power supply cables are properly connected to the system board.</li><li>4. Check to see if the 5V_aux light on the system board is turned on. If it is turned on, then replace the power button harness. If the</li></ol>

**Table 3 Diagnostic Front Panel LEDs and Audible Codes (continued)**

Activity	Beeps	Possible Cause	Recommended Action
			problem persists, replace the system board.
			5. If the 5V_aux light on the system board is not turned on, remove the expansion cards one at a time until the 5V_aux light on the system board turns on. If the problem persists, replace the power supply.