COMPAQ

Hardware and Software Guide

Compaq Notebook PC

Document Part Number: 396177-001

January 2006

This guide explains how to identify, access, and use most of the hardware and software features available on your computer. Modem information is not included in this guide.

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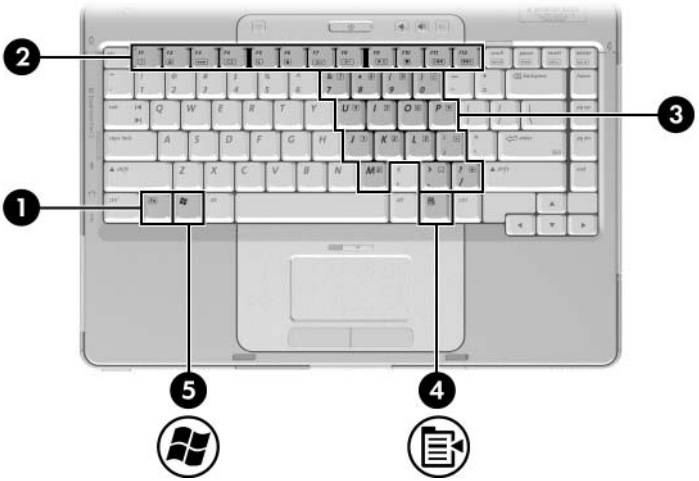
1

Hardware

Top Components

Keys

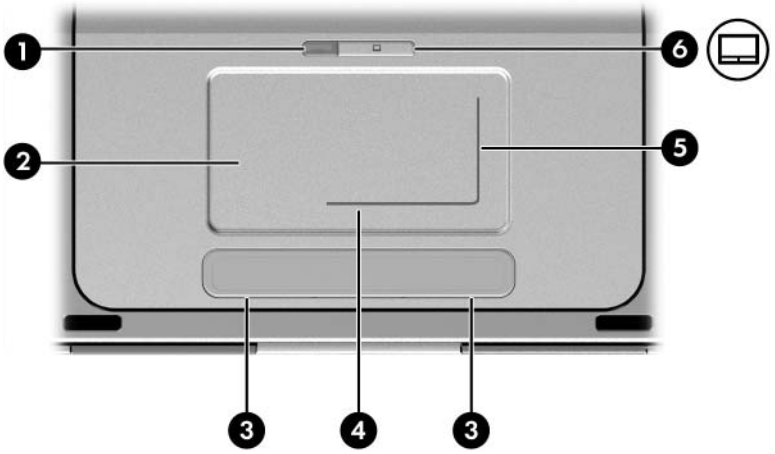


Component	Description
❶ **fn** key	Combines with other keys to perform system tasks. For example, pressing **fn+f7** decreases screen brightness.

(Continued)

Component		Description
❷	Function keys (12)	Perform system and application tasks. When combined with **fn,** the function keys perform additional tasks as hotkeys.
❸	Keypad keys (15)	Can be used like the keys on an external numeric keypad.
❹	Windows applications key	Displays a shortcut menu for items beneath the pointer.
❺	Windows logo key	Displays the Microsoft® Windows® Start menu.

TouchPad



Component		Description
❶	TouchPad light	On: TouchPad is enabled.
❷	TouchPad*	Moves the pointer.
❸	Left and right TouchPad buttons*	Function like the left and right buttons on an external mouse.
❹	TouchPad horizontal scrolling region*	Scrolls toward left side or right side.
❺	TouchPad vertical scrolling region*	Scrolls upward or downward.
❻	TouchPad button	Enables/disables the TouchPad.

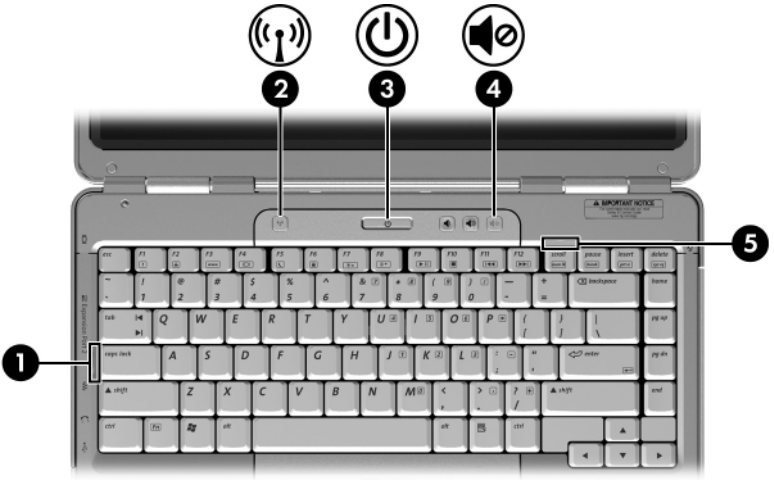
*This table describes default settings. For information about changing the functions of TouchPad components, refer to the "Setting TouchPad Preferences" section in Chapter 2, "Keyboard and Touchpad."

Power Controls

Component		Description
1	Display switch*	If the computer is closed while on, initiates standby.
2	Power button*	When the computer is ■ Off, press to turn on the computer. ■ On, briefly press to initiate hibernation. ■ In standby, briefly press to resume from standby. ■ In hibernation, briefly press to restore from hibernation. If the system has stopped responding and Windows shutdown procedures cannot be used, press and hold for at least 4 seconds to turn off the computer.

*This table describes default settings. For information about changing the function of the display switch or power button, refer to the "Setting Other Power Preferences" section in Chapter 3, "Power."

Lights

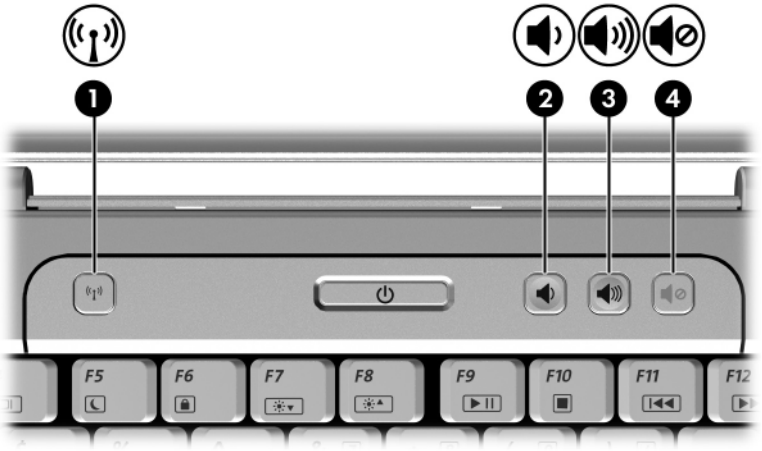


Component		Description
❶	Caps lock light	On: Caps lock is on.
❷	Wireless light (select models only)	On: One or more optional internal wireless devices, such as a WLAN and/or a Bluetooth® device, are turned on.*
❸	Power light†	On: Computer is turned on. Blinking: Computer is in standby. Off: Computer is off.
❹	Mute light	On: Volume is muted.
❺	Num lock light	On: Num lock or the embedded numeric keypad is on.

*For information about establishing a wireless connection, refer to Chapter 5, "Wireless (Select Models Only)."

†There are 2 power lights. Both lights display the same information. The light on the power button is visible only when the computer is open; the other power light is always visible on the front of the computer.

Wireless and Volume Buttons



Component		Description
❶	Wireless button (select models only)	Turns the wireless functionality on or off, but does not create a wireless connection. ✎ To establish a wireless connection, a wireless network must already be set up. For information about establishing a wireless link, refer to Chapter 5, "Wireless (Select Models Only)."
❷	Volume down button	Decreases system volume.
❸	Volume up button	Increases system volume.
❹	Volume mute button	Mutes or restores volume.

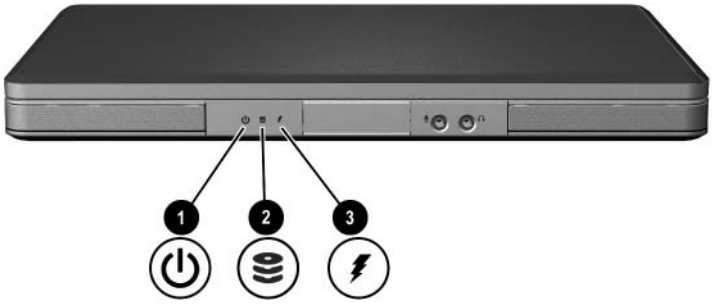
Antennae

Component	Description
Antennae (2)*	Send and receive wireless device signals. ⚠ For wireless regulatory notices in your region, refer to the *Regulatory, Safety, and Environmental Notices*.

*The antennae are available on only select models. The antennae are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennae free from obstructions.

Front Components

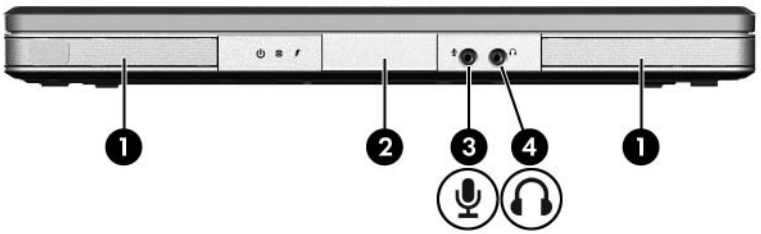
Lights



Component		Description
❶	Power light*	On: Computer is turned on. Blinking: Computer is in standby. Off: Computer is off.
❷	IDE (Integrated Drive Electronics) drive light	On or blinking: The internal hard drive or an optical drive is being accessed.
❸	Battery light	On: The battery pack is charging. Blinking: The battery pack has reached a low-battery condition. Off: The battery pack is fully charged or not inserted.

*There are 2 power lights. Both lights display the same information. The light on the power button is visible only when the computer is open; the other power light is always visible on the front of the computer.

Speakers, Jacks and Display Release Button



Component		Description
❶	Stereo speakers (2)	Produce stereo sound.
❷	Display release button	Opens the computer.
❸	Audio-in (microphone) jack	Connects an optional monaural (single sound channel) microphone.
❹	Audio-out (headphone) jack	Connects optional headphones or powered stereo speakers. Also connects the audio function of an audio/video device such as a television or VCR.

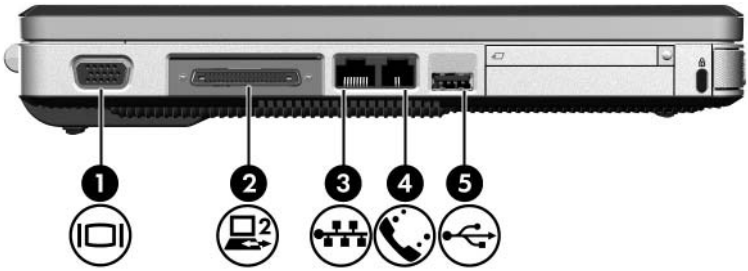
Rear Components

Component	Description
❶ Exhaust vent*	Provides airflow to cool internal components. △ To prevent overheating, do not obstruct vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as a printer, or a soft surface, such as pillows or thick rugs or clothing, to block airflow. ✎ The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
❷ Power connector	Connects the AC adapter cable.

*The computer has 4 vents. This and all other vents are visible on the bottom of the computer. One vent is also visible on the left side of the computer.

Left-Side Components

Ports and Jacks

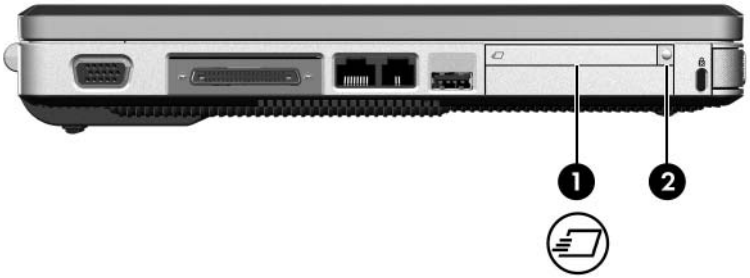


Component		Description
❶	External monitor port	Connects an optional VGA monitor or projector.
❷	Expansion port 2 (select models only)*	Connects the computer to an optional expansion product.
❸	RJ-45 (network) jack	Connects an optional network cable.
❹	RJ-11 (modem) jack	Connects the modem cable.
❺	USB port†	Connects an optional USB device.

*For expansion port signal information, refer to the "Expansion Port Input/Output Signals" section in "Appendix A."

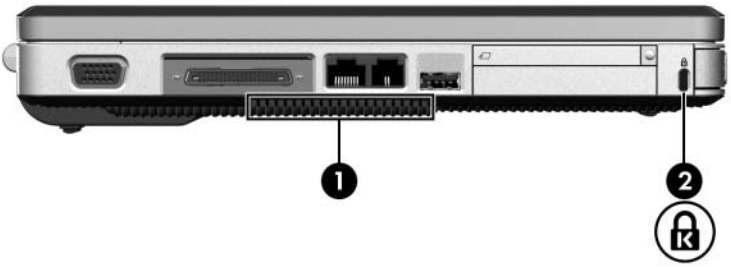
†Depending upon model, the computer has 2 or 3 USB ports. The other USB ports are on the right side of the computer.

ExpressCard Slot and Button



Component	Description
❶ ExpressCard slot	Supports optional ExpressCard/54 or ExpressCard/34 cards.
❷ ExpressCard eject button	Ejects an optional ExpressCard from the ExpressCard slot.

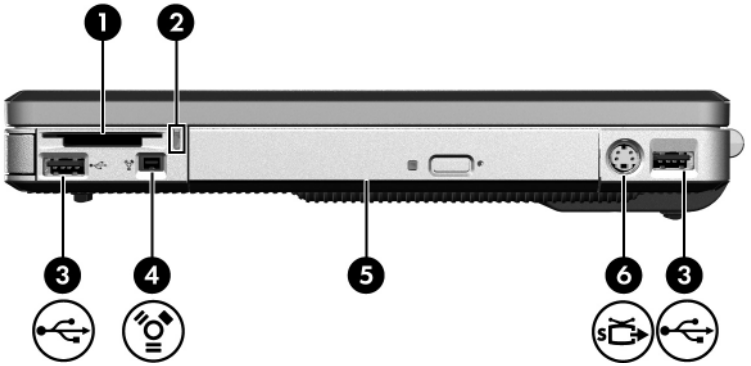
Vent and Security Cable Slot



Component	Description
❶ Exhaust vent*	Provides airflow to cool internal components. △ To prevent overheating, do not obstruct vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as a printer, or a soft surface, such as pillows or thick rugs or clothing, to block the airflow. ✎ The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
❷ Security cable slot	Attaches an optional security cable to the computer. ✎ The security cable is designed to act as a deterrent, but may not prevent the computer from being mishandled or stolen.

*The computer has 4 vents. This and all other vents are visible on the bottom of the computer. One vent is also visible on the rear of the computer.

Right-Side Components



Component		Description
1	Memory Reader (select models only)	Supports an optional digital card.†
2	Memory Reader light (select models only)	On: An optional digital card is being accessed.
3	USB ports (2)*	Connect optional USB devices. computer
4	1394 port (select models only)	Connects an optional 1394 device such as a scanner, a digital camera, or a digital camcorder.

(Continued)

Component		Description
❺	Optical drive‡	Supports an optical disc.
❻	S-Video–out jack	Connects an optional S-Video device such as a television, VCR, camcorder, projector, or video capture card.

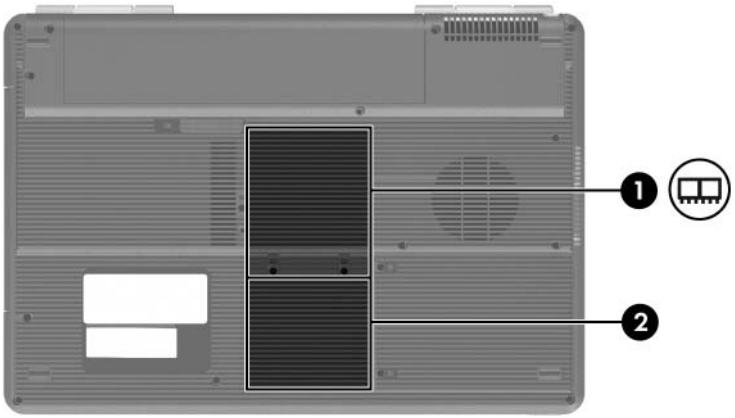
*Depending on the model, the computer has 2 or 3 USB ports. The other USB port is on the left side of the computer.

†The digital card could be a Secure Digital (SD) Memory Card, Memory Stick, Memory Stick Pro, xD-Picture Card, MultiMediaCard, or SmartMedia (SM) card.

‡The type of optical drive—for example, a DVD-ROM drive, a DVD/CD-RW Combo Drive, or a DVD+RW/R and CD-RW Combo Drive—varies by computer model.

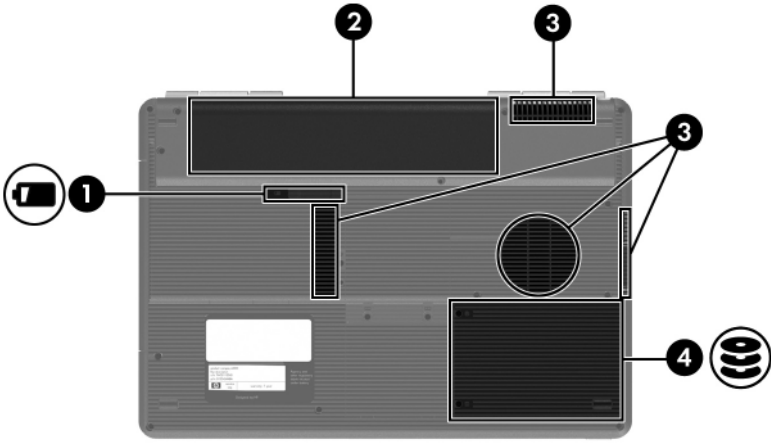
Bottom Components

Mini Card and Memory Compartments



Component	Description
❶ Memory compartment	Contains 2 memory slots that support replaceable memory modules. The number of preinstalled memory modules varies by computer model.
❷ Mini Card compartment	Holds an optional wireless LAN device. △ To prevent an unresponsive system and the display of a warning message, install only a Mini Card device authorized for use in your computer by the governmental agency that regulates wireless devices in your country. If you install a device and then receive a warning message, remove the device to restore computer functionality. Then contact Customer Care. To contact Customer Care, click **Contact a Technician** in the Help and Support Center.

Bays, Battery Latch and Vents



Component		Description
❶	Battery pack release latch	Releases a battery pack from the battery bay.*
❷	Battery bay	Holds a battery pack.

(Continued)

Component		Description
❸	Exhaust vents (4)†	Provide airflow to cool internal components. △ To prevent overheating, do not obstruct vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as a printer, or a soft surface, such as pillows or thick rugs or clothing, to block the airflow. △ The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation
❹	Hard drive bay	Holds the internal hard drive.

*Battery packs vary by model.

†The computer has 4 vents. One vent is also visible on the left side of the computer, and one vent is also visible on the rear of the computer.

Additional Components

Hardware

The components included with your computer vary by region, country, computer model, and the optional hardware you purchased. The following sections identify the standard external components included with most computer models.

Component		Description
❶	Battery pack	Powers the computer when the computer is not connected to external power.
❷	AC adapter	Converts AC power to DC power.
❸	Power cord	Connects an AC adapter to an AC outlet.

✎ Power cords and adapters vary in appearance by region and country. Battery packs vary by model.

Optical Discs

The computer includes software provided on optical discs (CDs and DVDs).

Locate the plastic bag included with the computer and remove the discs that display the sticker below.

403144-B21

Depending on how you plan to use your computer, you may want to install the software contained on these discs now.

For instructions on inserting and removing an optical disc, refer to "CD and DVD Procedures," in Chapter 4, "Multimedia."

Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer.

The appearance and position of labels varies by model.

- Service tag—Provides the product name, serial number (s/n), and other specifics about the computer. Have this information available when you contact Customer Care. The service tag label is affixed to the bottom of the computer.
- Microsoft Certificate of Authenticity—Contains the Microsoft Windows Product Key. You may need the Product Key to update or troubleshoot the operating system. This certificate is affixed to the bottom of the computer.
- Regulatory label—Provides regulatory information about the computer. The regulatory label is affixed to the bottom of the computer.
- Modem approval label—Provides regulatory information about the modem and lists the agency approval markings required by some of the countries in which the modem has been approved for use. You may need this information when traveling internationally. The modem approval label is affixed on the inside of the memory module compartment cover.
- Wireless certification label(s)—Provide information about optional wireless devices available on select models, and the approval markings of some of the countries in which the devices have been approved for use. An optional device may be a wireless local area network (WLAN) device or a Bluetooth® device. If the computer model includes one or more wireless devices, one or more certification labels are included with the computer. You may need this information when traveling internationally. Wireless certification labels are affixed on the inside of the Mini Card compartment cover.

2

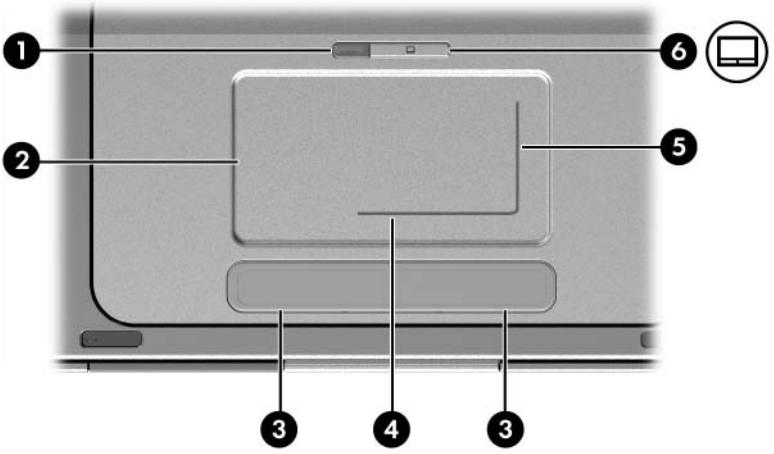
Keyboard and Touchpad

TouchPad

Identifying TouchPad Components

The TouchPad includes the following components:

❶ TouchPad light	❹ TouchPad horizontal scrolling region
❷ TouchPad	❺ TouchPad vertical scrolling region
❸ Left and right TouchPad buttons	❻ TouchPad button



Using the TouchPad

The TouchPad provides the navigation, selection, and scroll functions of an optional external mouse:

- To move the pointer, slide your finger across the TouchPad surface in the direction you want to move the pointer.
- To execute the click functions of the left or right button on an external mouse, press the left or right TouchPad button.
- To scroll, place your finger onto a scrolling region, and then slide your finger along the scrolling region in the direction you want to scroll. (Sliding your finger from the TouchPad to a scrolling region without first lifting your finger from the TouchPad and then placing it on the scrolling region will not activate the scrolling region.)
- To enable or disable the TouchPad, press the TouchPad button. When the TouchPad is enabled, the TouchPad light is on.

  The TouchPad is enabled when the computer is turned on. If you work with keystrokes rather than mouse actions, you may prefer to disable the TouchPad to prevent accidental TouchPad activity.

Setting TouchPad Preferences

In the Windows Mouse Properties window you can

- Adjust basic pointing device settings such as click speed, pointer speed and shape, and mouse trails.
- Configure the right and left TouchPad buttons for right-handed or left-handed use. These buttons are set by default for right-handed use.

To access the Mouse Properties window:

» Select **Start > Control Panel > Printers and Other Hardware > Mouse**.

In the TouchPad Properties window you can access additional TouchPad preferences.

To access the TouchPad Properties window:

» Use the TouchPad to select **Start > Control Panel > Printers and Other Hardware > Mouse > Device Settings**, and then select the **Settings** button. (If you follow this path using an optional external mouse, the TouchPad Properties window may be unavailable.)

Among the preferences available in the TouchPad Properties window are

- TouchPad Tapping, which enables you to tap the TouchPad once to select an item or twice to double-click an item.

  To access TouchPad Tapping settings, select **Tapping**.

- Edge Motion, which sets the TouchPad to continue cursor movement when your finger reaches the edge of the TouchPad.

  To access Edge Motion settings, select **Pointer Motion**.

- Long Distance Scrolling, which sets the scrolling region to continue scrolling when your finger reaches the end of the scrolling region.

  To access Long Distance Scrolling, select **Virtual Scrolling**.

- PalmCheck, which helps keep the TouchPad from being accidentally activated while you are using the keyboard.

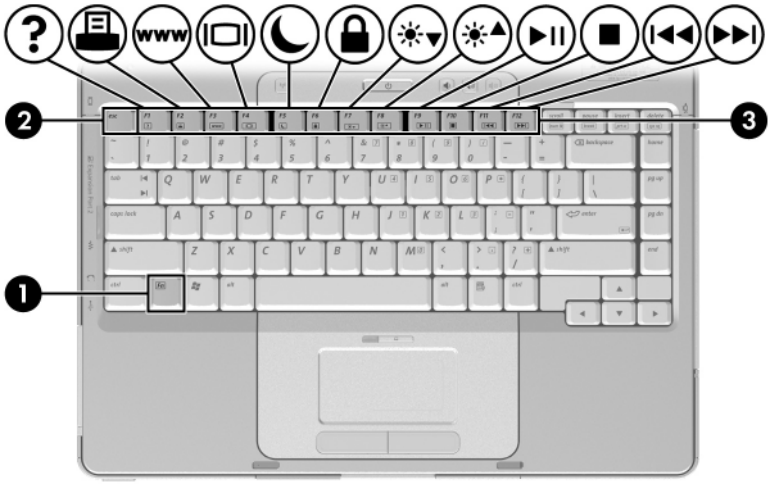
  To access PalmCheck, select **Sensitivity**.

Hotkeys

Identifying Hotkeys

Hotkeys are preset combinations of the **fn** key ❶, the **esc** key ❷, and one of the function keys ❸.

The icons on the **f1** through **f12** keys represent hotkey functions. Hotkey functions and procedures are described in the following sections.



Hotkey Quick Reference

The following table identifies the default hotkey functions. The function of the **fn+f5** hotkey can be changed. For instructions, refer to the "Setting Other Power Preferences" section in Chapter 3, "Power."

Default Function	Hotkey
Open the Help and Support Center.	**fn+f1**
Open the Print Options window.	**fn+f2**
Open the default Internet browser.	**fn+f3**
Switch the image among displays.	**fn+f4**
Initiate standby.	**fn+f5**
Initiate QuickLock.	**fn+f6**
Decrease screen brightness.	**fn+f7**
Increase screen brightness.	**fn+f8**
Play, pause, or resume an audio CD or DVD.	**fn+f9**
Stop an audio CD or DVD.	**fn+f10**
Play the previous track or chapter on an audio CD or DVD.	**fn+f11**
Play the next track or chapter on an audio CD or DVD.	**fn+f12**
Display system information.	**fn+esc**
Clear the system information display.	**esc**

Using Hotkey Procedures

Using Hotkeys On the Internal Keyboard

To use a hotkey command on the computer keyboard, use either of the following procedures:

- Briefly press **fn**, and then briefly press the second key of the hotkey command.
- Press and hold down **fn**, briefly press the second key of the hotkey command, and then release both keys at the same time.

Using Hotkey Commands

Open the Help and Support Center (fn+f1)

The **fn+f1** hotkey opens the Help and Support Center.

In addition to providing information about your operating system, the Help and Support Center provides

- Information about your computer, such as model and serial number, installed software, hardware components, and specifications.
- Answers to questions about using your computer.
- Tutorials to help you learn to use computer and operating system features.
- Updates for your operating system, drivers, and the software provided on your computer.
- Checkups for computer functionality.
- Automated and interactive troubleshooting, repair solutions, and system recovery procedures.
- Links to Customer Care.

Open the Print Options Window (fn+f2)

In Windows the **fn+f2** hotkey opens the Print Options window of the active Windows application.

Open the Default Internet Browser (fn+f3)

The **fn+f3** hotkey opens the default Internet browser.

- Until you have set up your Internet or network services, the **fn+f3** hotkey opens the Windows Internet Connection Wizard.
- After you have set up your Internet or network services and your Web browser home page, you can use the **fn+f3** hotkey to quickly access your home page and the Internet.

Switch the Image Among Displays (fn+f4)

The **fn+f4** hotkey switches the image among display devices connected to the system. For example, if an optional monitor is connected to the computer through the monitor port, each time you press the **fn+f4** hotkey the image will switch among the computer display, the monitor display, and a simultaneous display on both the computer and the monitor.

Most monitors receive video information from the computer using the external VGA video standard. The **fn+f4** hotkey can also toggle images among other devices receiving video information from the computer.

The following video transmission types, with examples of devices that use them, are supported by the **fn+f4** hotkey:

- LCD (computer display)
- External VGA (most monitors)
- S-Video (televisions, camcorders, VCRs, and video capture cards with S-Video–in jacks)
- Composite video (televisions, camcorders, VCRs, and video capture cards with composite video-in jacks)

Composite video is available only with an optional expansion product.

Initiate Standby (fn+f5)

The **fn+f5** hotkey is set by default to initiate standby.

When standby is initiated, your work is saved in random access memory (RAM), the screen clears, and power is conserved. While the computer is in standby, the power lights blink.

- To initiate standby, the computer must be on. If the computer is in hibernation, you must restore from hibernation before you can initiate standby.
- To resume from standby or restore from hibernation, briefly press the power button.

For more information about using standby and hibernation, refer to Chapter 3, "Power."

The function of the **fn+f5** hotkey can be changed in the operating system. For example, you can set the **fn+f5** hotkey to initiate hibernation instead of standby. In all Windows operating system windows, references to the *sleep button* apply to the **fn+f5** hotkey. For information about changing the function of the **fn+f5** hotkey, refer to the "Setting Other Power Preferences" section in Chapter 3, "Power."

For more information about using standby and hibernation, refer to Chapter 3, "Power."

Initiate QuickLock (fn+f6)

The **fn+f6** hotkey initiates the QuickLock security feature.

QuickLock protects your work by displaying the operating system Log On window. While the Log On window is displayed, the computer cannot be accessed until a Windows user password or a Windows administrator password is entered.

Before you can use QuickLock, you must set a Windows user password or a Windows administrator password. For instructions, refer to the Help and Support Center. To access the Help and Support Center, press the **fn+f1** hotkey or select **Start > Help and Support**.

To use QuickLock:

» Press **fn+f6** to display the Log On window and lock the computer. Then follow the instructions on the screen to enter your Windows user password or your Windows administrator password and access the computer.

For information about combining Windows passwords with Setup Utility passwords, refer to Chapter 6, "Security."

Decrease Screen Brightness (fn+f7)

The **fn+f7** hotkey decreases the brightness of the computer screen. The longer you hold down the **fn+f7** hotkey, the more the screen dims. Decreasing screen brightness conserves power.

To increase screen brightness:

» Press the **fn+f8** hotkey.

Increase Screen Brightness (fn+f8)

The **fn+f8** hotkey increases the brightness of the computer screen. The longer you hold down the **fn+f8** hotkey, the more the screen brightens.

To decrease screen brightness:

» Press the **fn+f7** hotkey.

Media Activity Hotkeys (fn+f9 through fn+f12)

The following 4 media activity hotkeys can control the play of an audio CD or a DVD. To control the play of a video CD, use the media activity controls in your video CD player.

Play, Pause or Resume an Audio CD or a DVD (fn+f9)

- If the audio CD or the DVD is not playing, press the **fn+f9** hotkey to begin or resume the play.
- If the audio CD or the DVD is playing, press the **fn+f9** hotkey to pause the play.

Stop an Audio CD or a DVD (fn+f10)

The **fn+f10** hotkey stops the play of an audio CD or a DVD.

You must stop a CD or DVD that is playing before you can remove it from the optical drive.

Play Previous Track or Chapter of an Audio CD or a DVD (fn+f11)

The **fn+f11** hotkey plays the previous track of an audio CD or the previous chapter of a DVD that is playing.

Play Next Track or Chapter of an Audio CD or a DVD (fn+f12)

The **fn+f12** hotkey plays the next track of an audio CD or the next chapter of a DVD that is playing.

Display System Information (fn+esc)

The **fn+esc** hotkey displays information about system hardware components and firmware version numbers.

To clear the display:

» Press **esc**.

In the **fn+esc** display, the version of the system BIOS (basic input-output system) is displayed as the BIOS date. On some computer models, the BIOS date is displayed in decimal format. The BIOS date is sometimes called the *system ROM version number.* For information about updating the system ROM, refer to the "Software Updates" section in Chapter 8, "Software Updates and Recovery and System Software."

Keypads

You can do keypad work with your computer by using the embedded numeric keypad in the computer keyboard or by connecting an optional external numeric keypad.

The embedded numeric keypad cannot be used while an external keypad is connected to the computer.

Using the Embedded Numeric Keypad

The embedded numeric keypad consists of 15 keys that can be used like the keys on an external numeric keypad. When the embedded numeric keypad is turned on, each keypad key performs the functions indicated by the icon in the upper-right corner of the key.

Turning the Embedded Numeric Keypad On and Off

When the embedded numeric keypad is off, press **fn+num lk** ❶ to turn the keypad on. The num lock light ❷ is turned on.

When the embedded numeric keypad is on, press **fn+num lk** to turn the keypad off. The num lock light is turned off.

Switching the Functions of Keypad Keys

You can temporarily switch the functions of an embedded numeric keypad key between its standard function and its keypad function.

- To use a key on the keypad as a keypad key while the keypad is turned off, press and hold **fn** while pressing the key.
- To use a key on the keypad as a standard key while the keypad is turned on:
  - Press and hold **fn** to type with the key in lowercase.
  - Press and hold **fn+shift** to type with the key in uppercase.

Releasing **fn** returns a keypad key to its set function. For example, a keypad key returns to its keypad function if the keypad is turned on or to its standard function if the keypad is turned off.

Using an External Numeric Keypad

The embedded numeric keypad cannot be used while an optional external numeric keypad is connected to the computer.

Most keys on most external numeric keypads function differently depending on whether num lock mode is on or off. For example:

- When num lock mode is on, most keypad keys type numbers.
- When num lock mode is off, most keypad keys function like the arrow, page up, or page down keys.

Turning Num Lock Mode On and Off As You Work

To turn num lock mode on or off on an external numeric keypad as you work, press the **num lk** key on the external keypad, not on the computer.

- When an external numeric keypad is turned on and is in num lock mode, the num lock light on the computer is on.
- When an external numeric keypad is turned off or is turned on with num lock mode turned off, the num lock light on the computer is off.

3

Power

Power Sources

Selecting a Power Source

Use the following table to select a recommended power source for the way you plan to use the computer.

Task	Recommended Power Source
Work in most software applications	■ Charged battery pack in the computer ■ External power supplied through one of the following devices: ❒ AC adapter ❒ Optional expansion product ❒ Optional power adapter
Charge or calibrate a battery pack in the computer	External power supplied through one of the following devices: ■ AC adapter ■ Optional expansion product ■ Optional power adapter ⚠ Do not charge the computer battery pack onboard aircraft. Charging the battery pack may damage aircraft electronic systems.
Install or modify system software or write to an optical disc	External power supplied through one of the following devices: ■ AC adapter ■ Optional expansion product ■ Optional power adapter

Connecting the AC Adapter

WARNING: To reduce the risk of electric shock or damage to the equipment:

- Plug the power cord into an AC outlet that is easily accessible at all times.
- Disconnect power from the computer by unplugging the power cord from the AC outlet (not by unplugging the power cord from the computer).
- If provided with a 3-pin attachment plug on the power cord, plug the cord into a grounded (earthed) 3-pin outlet. Do not disable the power cord grounding pin; for example, by attaching a 2-pin adapter. The grounding pin is an important safety feature. It is possible to receive an electric shock from a system that is not properly grounded.

To connect the computer to external AC power:

1. Plug the AC adapter into the power connector ❶ on the computer.
2. Plug the power cord into the AC adapter ❷.
3. Plug the other end of the power cord into an AC outlet ❸.

Switching Between Battery and External Power

The computer runs on external power whenever external power is available to the computer. This conserves the charge in an inserted battery pack. External power can be supplied through the AC adapter, an optional expansion product, or an optional combination power adapter.

Because the computer switches between battery power and external power according to the availability of external power:

- If the computer is running on battery power and you connect the computer to external power, the computer switches to external power.
- If the computer is running on external power (and contains a charged battery pack) and you disconnect the computer from external power, the computer switches to battery power.

Displaying the Power Meter Icon

A Power Meter icon is displayed by default in the taskbar. The Power Meter icon changes shape whenever the power source changes between battery power and external power.

If the Power Meter icon is not displayed in your taskbar:

1. Select **Start > Control Panel > Performance and Maintenance > Power Options**.
2. Select the **Advanced** tab.
3. Select the **Always show icon on the taskbar** check box.
4. Select **OK**.

If you cannot see an icon you have placed in the notification area, at the far right of the taskbar, click the arrow in the notification area to view hidden icons.

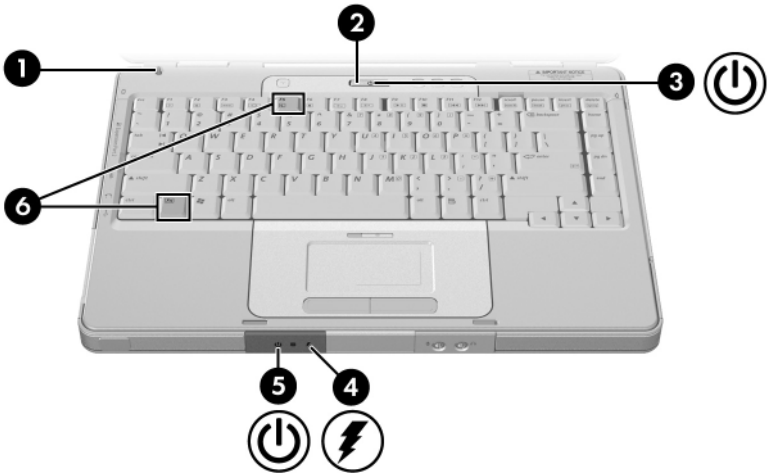
Power Control and Light Locations

This illustration is provided as a quick reference to the locations of the power controls and lights on the computer.

The function of each of these items is summarized in Chapter 1, "Hardware" Instructions for using these items are provided in this chapter.

❶ Display switch	❹ Battery light
❷ Power button	❺ Power light
❸ Power light	❻ **fn+f5** hotkey

There are 2 power lights. Both display the same information. The light on the power button is visible only when the computer is open; the other power light is always visible on the front of the computer.



Standby, Hibernation and Shutdown Overviews

Standby

CAUTION: To avoid a complete battery discharge, do not leave your computer in standby for extended periods. Connect the computer to an external power source.

Standby reduces power to system components that are not in use. When standby is initiated, your work is stored in random access memory (RAM), the screen is cleared, and the power lights blink. Saving your work before initiating standby is not usually necessary but is a recommended precaution. When you resume from standby, your work is returned to the screen.

By default, the system initiates standby after 10 minutes of computer inactivity when the computer is running on battery power and after 25 minutes of inactivity when the computer is running on external power. For information about changing these settings, refer to the "Using Power Schemes" section later in this chapter.

Hibernation

CAUTION: If the configuration of the computer system is changed during hibernation, it may not be possible to resume from hibernation. When the computer is in hibernation:

- Do not connect or disconnect the computer from an expansion product.
- Do not add or remove any memory modules.
- Do not insert remove or replace any hard drives or optical drives.
- Do not connect or disconnect an external device.
- Do not insert or remove an external media card such as an ExpressCard or a Memory Reader card.

Hibernation saves your work to a hibernation file on the hard drive and then shuts down the computer. When hibernation is complete, the power lights are turned off.

When you restore from hibernation, your work is returned to the screen where you left off. If a power-on password has been set, the password must be entered to restore from hibernation. Restoring from hibernation takes a little longer than resuming from standby but is much faster than returning to your place manually after restarting the computer.

To determine whether the computer is in hibernation or turned off, press the power button.

- If the computer is in hibernation, your work is returned to the screen.
- If the computer is off, Windows loads.

When the computer is running on battery power, hibernation is initiated by default after 30 minutes of computer inactivity or whenever the computer reaches a critical low-battery condition.

Hibernation is enabled by default but can be disabled. To prevent loss of work during a critical low-battery condition, disable hibernation only during a battery pack calibration.

To be sure that hibernation is enabled:

» Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab. If hibernation is enabled, the **Enable hibernation** check box is selected.

To set the time interval after which the system initiates hibernation:

1. Select **Start > Control Panel > Performance and Maintenance > Power Options**.
2. Click one of the intervals in the **System hibernates** list.

Leaving Your Work

If you plan to resume shortly—Initiate standby for shorter times and hibernation for longer times or for power conservation.

The amount of time a battery pack can support standby or hibernation or hold a charge varies by computer configuration and the condition of the battery pack. Standby requires more power than hibernation.

If you plan to resume within 2 weeks—Shut down the computer. If possible, connect the computer to external power to keep an inserted battery pack fully charged.

If the computer will be unused and disconnected from external power for more than 2 weeks—Shut down the computer. To extend the life of an inserted battery pack, remove the battery pack and store it in a cool, dry location. For information about storing the battery pack, refer to "Storing a Battery Pack," later in this chapter.

If an external power supply is uncertain (for example, during an electrical storm or low-battery condition)—Take one of the following actions:

- Save your work, and then initiate standby.
- Save your work, and then initiate hibernation.
- Shut down the computer.

Interference with Drive Media and Bluetooth Communication (Select Models Only)

CAUTION: To prevent the loss of information, possible audio and video degradation, or loss of audio or video playback quality, do not initiate standby or hibernation while reading or writing to an optical disc.

Standby and hibernation interfere with the use of media and with Bluetooth communication. Note the following guidelines:

- If the computer is in standby or hibernation, you cannot initiate a Bluetooth transmission.
- If standby or hibernation is initiated while a drive medium such as a CD or DVD is in use
  - ❏ Your playback may be interrupted.
  - ❏ You may see the warning message "Putting the computer into hibernation or standby may stop the playback. Do you want to continue?" If the message is displayed, click **No**.
  - ❏ You may need to restart the CD or DVD to resume playback.

Standby, Hibernation and Shutdown Procedures

This section explains the default standby, hibernation, and shutdown procedures. For information about changing the function of some of the power features on your computer, refer to the "Power Preferences" section later in this chapter.

The controls and lights discussed in this section are illustrated in in the "Power Control and Light Locations" section earlier in this chapter.

Turning the Computer On or Off

Task	Procedure	Results
Turn on the computer.	Press the power button. ✎ Pressing the power button turns on the computer from standby, hibernation, or shutdown.	■ Power lights are turned on. ■ Operating system is loaded.
Shut down the computer.	Save your work and close all open applications. Then shut down the computer through the operating system by selecting **Start > Turn Off Computer > Turn Off**. ✎ If the system is unresponsive and you are unable to shut down the computer with this procedure, refer to the "Using Emergency Shutdown Procedures" section later in this chapter.	■ Power lights are turned off. ■ Operating system shuts down. ■ Computer is turned off.
Turn off the display while the power is on	Close the computer.	Closing the computer activates the display switch, which initiates standby.

Initiating or Resuming from Standby

Task	Procedure	Result
Initiate standby.	With the computer on, use any of the following procedures: ■ Press the **fn+f5** hotkey. ■ Close the computer. ■ Select **Start > Turn Off Computer > Stand by**. In Windows XP Professional, if Stand by is not displayed: 1. Press the down arrow. 2. Select **Stand by** from the drop-down list. 3. Click **OK**.	■ Power lights blink. ■ Screen clears.
Allow the system to initiate standby.	No action is required. The system initiates standby ■ After 10 minutes of inactivity while running on battery power. ■ After 25 minutes of inactivity while running on external power.	■ Power lights blink. ■ Screen is cleared.
Resume from standby.	Press the power button.*	■ Power lights are turned on. ■ Your work returns to the screen.

*Depending on your computer configuration, you may also be able to resume from standby by moving or activating a control on an optional mouse or by opening the display if the computer was closed while in standby.

Initiating or Restoring from Hibernation

Hibernation cannot be initiated unless it is enabled. Hibernation is enabled by default.

To be sure that hibernation remains enabled

» Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab. If hibernation is enabled, the **Enable hibernation** check box is selected.

Task	Procedure	Result
Initiate hibernation.	Select **Start > Turn Off Computer**. Then hold down **shift** as you select **Hibernate**. In Windows XP Professional, if hibernate is not displayed: 1. Press the down arrow. 2. Select **Hibernate** from the drop-down list. 3. Click **OK**.	■ Power lights are turned off. ■ Screen clears.
Allow the system to initiate hibernation.	No action is required. If the computer is running on battery power and hibernation is enabled, the system initiates hibernation ■ After 30 minutes of computer inactivity. ■ When the battery pack reaches a critical low-battery condition. ✎ Power settings and time-outs can be changed using Power Options in Windows Control Panel.	■ Power lights are turned off. ■ Screen clears.
Restore from hibernation.	Press the power button.*	■ Power lights are turned on. ■ Your work returns to the screen.

*If the system initiated hibernation because of a critical low-battery condition, connect external power or insert a charged battery pack before you press the power button. (The system may not respond if the discharged battery pack is the only power source.)

Using Emergency Shutdown Procedures

CAUTION: Emergency shutdown procedures result in the loss of unsaved information.

If the computer is unresponsive and you are unable to use normal Windows shutdown procedures, try the following emergency procedures in the sequence provided:

- Press **ctrl+alt+del**. Then select **Shut Down > Turn Off**.
- Press and hold down the power button for at least 4 seconds.
- Unplug the computer from external power and remove the battery pack. For battery pack removal instructions refer to the "Inserting or Removing a Battery Pack" section later in this chapter.

Power Preferences

Using Power Schemes

A power scheme controls the amount of power the computer uses while running on external power or on a battery pack, and also sets the computer to initiate standby or hibernation after a period of inactivity you specify.

To select a preset power scheme or create a custom power scheme:

» Select **Start > Control Panel > Performance and Maintenance > Power Options**, and then follow the instructions on the screen.

Setting a Security Prompt

You can add a security feature that prompts you for a password when the computer is turned on, resumes from standby, or restores from hibernation.

To set a password prompt:

1. Select **Start > Control Panel > Performance and Maintenance > Power Options > Advanced** tab.
2. Select the **Prompt for password when computer resumes from standby** check box, and then click **OK**.
3. Click **Apply**.

For information about other passwords and security features, refer to Chapter 6, "Security."

Setting Other Power Preferences

You can change the function of the power button, the **fn+f5** hotkey, and the display switch.

By default, when the computer is on:

- Briefly pressing the power button initiates hibernation.
- Pressing the **fn+f5** hotkey, called the *sleep button* in all Microsoft operating systems, initiates standby.
- Closing the display activates the display switch, which turns off the display and initiates standby.

To change the function of the power button, the **fn+f5** hotkey, or the display switch:

1. Select **Start > Control Panel > Performance and Maintenance > Power Options > Advanced** tab.
   - ❏ To change the function of the power button, select a function from the drop-down list for "When I press the power button on my computer."
   - ❏ To change the function of the **fn+f5** hotkey, select a function from the drop-down list for "When I press the sleep button on my computer."
   - ❏ To change the function of the display switch, select a function from the drop-down list for "When I close the lid of my portable computer." (The function of the display switch when you *open* the display is unaffected by these settings. If you initiate standby by closing the display, the display switch turns on the computer when you open the display.)
2. Click **OK**.

The Hibernate function is available in the power button, sleep button, and display switch drop-down lists only if hibernation is enabled. If the Hibernate function is not available on these lists, select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab. Select the **Enable hibernation** check box, and then click **OK**.

Processor Performance Controls (Select Models Only)

CAUTION: To prevent overheating, do not obstruct vents. Use the computer only on a hard flat surface. Do not allow another hard surface, such as a printer, or a soft surface, such as pillows or thick rugs or clothing, to block the airflow.

In some cases, a computer may operate at a higher speed on external power than on battery power. If the battery pack is the sole source of power, and the battery power is extremely low, the computer may attempt to conserve power by reducing processor speed and graphics performance.

Windows XP enables you to manage processor performance controls by selecting a power scheme. The processing speed can be set for optimal performance or for optimal power conservation.

After a power scheme has been set, no other intervention is required to control the performance of your computer processor. The following table describes the processor performance on external and battery power for the available power schemes.

Power Scheme	Processor Performance While on External Power	Processor Performance While on Battery Power
Home/Office Desk	Always runs at the highest performance state.	Performance state is determined based on CPU demand.
Portable/Laptop (default)*	Performance state is determined based on CPU demand.	Performance state is determined based on CPU demand.
Presentation	Performance state is determined based on CPU demand.	Runs at the lowest possible performance state.
Always On	Always runs at the highest performance state.	Always runs at the highest performance state.
Minimal Power Management	Performance state is determined based on CPU demand.	Performance state is determined based on CPU demand.
Max Battery	Performance state is determined based on CPU demand.	Runs at the lowest possible performance state.

*It is recommended that you use the Portable/Laptop power scheme.

Battery Pack

WARNING: To reduce potential safety issues, only the AC adapter provided with the computer, a replacement AC adapter provided by HP, or a compatible battery pack purchased as an accessory from HP should be used with the computer.

Inserting or Removing a Battery Pack

Inserting a Battery Pack

Although battery packs vary by model, the insertion procedure is the same for all models.

To insert a battery pack:

1. Turn the computer upside down on a flat surface.
2. Insert the battery pack into the battery bay ❶ and rotate it ❷ until it is seated.

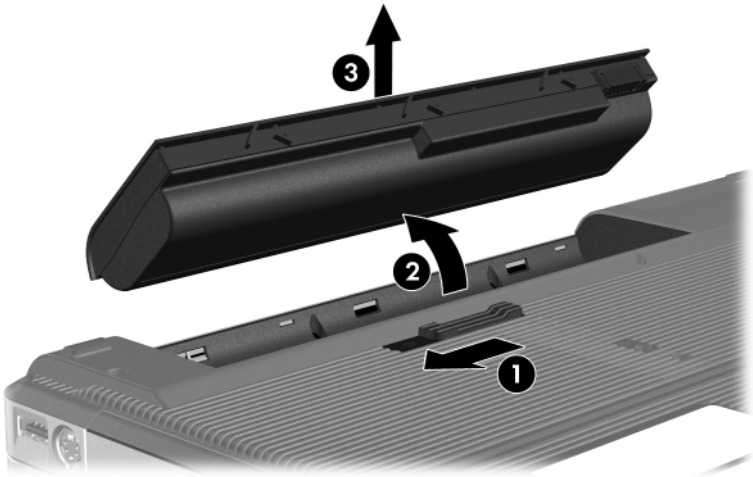
Removing a Battery Pack

CAUTION: To prevent loss of work when removing a battery pack that is the sole power source, initiate hibernation or turn off the computer before removing the battery pack.

Although battery packs vary by model, the removal procedure is the same for all models.

To remove a battery pack:

1. Turn the computer upside down with the battery bay facing you.
2. Slide the battery release latch ❶ to release the battery pack.
3. Pivot the battery pack away from the computer ❷ and remove it from the battery bay ❸.



Charging a Battery Pack

The battery pack charges when it is inserted into the computer and the computer is connected to external power. External power can be supplied through the following:

- AC adapter
- Optional expansion product (select models only)
- Optional power adapter

WARNING: To reduce potential safety issues, only the AC adapter provided with the computer, a replacement AC adapter provided by HP, or a compatible battery pack purchased as an accessory from HP should be used with this computer.

To prolong battery life and optimize the accuracy of battery charge displays:

- If you are charging a *new* battery pack:
  - ❏ Charge the battery pack while the computer is connected to external power through the AC adapter.
  - ❏ When you charge the battery pack, charge it fully.
- If you are charging an *in-use* battery pack:
  - ❏ Allow the battery pack to discharge to about 10 percent of a full charge through normal use before charging it.
  - ❏ When you charge the battery pack, charge it fully.

A battery pack inserted in the computer charges whenever the computer is plugged into external power through an AC adapter, an optional power adapter, or docked in an optional expansion product.

WARNING: Do *not* charge the computer battery pack onboard aircraft. Charging the battery pack may damage aircraft electronic systems.

A battery pack inserted in the computer charges whether the computer is off or in use, but the battery pack charges faster while the computer is off. Charging may be delayed if a battery pack is new, has been unused for 2 weeks or more, or is much warmer or cooler than room temperature.

The battery light displays charge status:

- On: the battery pack is charging.
- Blinking: the battery pack has reached a low-battery condition and is not charging.
- Off: the battery pack is fully charged or not installed.

For information about determining the amount of charge in a battery pack, refer to the "Monitoring the Battery Pack Charge" section next in this chapter.

Monitoring the Battery Pack Charge

Obtaining Accurate Charge Information

To increase the accuracy of battery charge reports:

- Allow a battery pack to discharge to about 10 percent of a full charge through normal use before charging it.
- When you charge a battery pack, charge it fully.
- If a battery pack has been unused for one month or more, calibrate the battery pack instead of simply charging it.

For information about battery calibration, refer to the "Calibrating a Battery Pack" section later in this chapter.

Displaying Charge Reports

To display battery charge information on the screen, use the operating system Power Meter feature. To access the Power Meter display:

- Select **Start > Control Panel > Performance and Maintenance > Power Options > Power Meter** tab.

– or –

- Select the **Power Meter** icon, which is displayed by default in the notification area, at the far right of the taskbar. To display the Power Meter icon if the default setting has been changed, select **Start > Control Panel > Performance and Maintenance > Power Options**. Select the **Advanced** tab, select the **Always show icon on the taskbar** check box, and then click **OK**.

Interpreting Charge Indicators

Power Meter displays battery status in both percent and time:

- The percent indicates the amount of charge remaining in the battery pack.
- The time indicates the approximate running time remaining on the battery pack *if the battery pack continues to provide power at the current level.* For example, the time remaining will decrease if you start playing a DVD and will increase if you stop playing a DVD.

Managing Low-Battery Conditions

This section describes default low-battery condition alerts and system responses. The default battery light responses cannot be changed. To change other responses, select **Start > Control Panel > Performance and Maintenance > Power Options**, and then follow the instructions on the screen.

Identifying Low-Battery Conditions

When a battery pack that is the only power source for the computer reaches a *low-battery condition,* a text warning message is displayed, and the battery light blinks.

If a low-battery condition is not resolved and the amount of charge remaining in the battery pack continues to drop, the computer eventually enters a *critical low-battery condition.* If the computer is on or in standby when a critical low-battery condition is reached:

- If hibernation is enabled, the system initiates hibernation. Some unsaved work may be lost.
- If hibernation is disabled, the computer remains briefly in standby, and then shuts down. All unsaved work is lost.

Hibernation is enabled by default. To be sure that hibernation remains enabled, select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab. If hibernation is enabled, the **Enable hibernation** check box is selected.

Resolving Low-Battery Conditions

CAUTION: To reduce the risk of losing information when the computer reaches a critical low-battery condition and has initiated hibernation, do not restore power until the power lights are off.

To resolve a low-battery condition:

- If external power is available, connect the computer to the external power source.
- If a charged battery pack is available, shut down the computer or initiate hibernation. Insert a charged battery pack, and then turn on the computer.
- If no power source is available, save your work. Then initiate hibernation or shut down the computer.

Calibrating a Battery Pack

Three steps are involved in calibrating the battery pack: fully charging, fully discharging, and then fully recharging.

When to Calibrate

Even if a battery pack is heavily used, calibration should be necessary only once a month. You do not have to calibrate a new battery pack.

Calibration does not usually increase battery run time, but it can increase the accuracy of battery charge displays, especially under the following conditions:

- When the battery pack has been unused for one month or more.
- When you notice a significant change in battery run time.
- When battery charge displays seem inaccurate.

  For more information about battery charge displays, refer to the "Monitoring the Battery Pack Charge" section earlier in this chapter.

How to Calibrate

To calibrate a battery pack, you must fully charge, fully discharge, and then fully recharge the battery pack.

Step 1: Charging the Battery Pack

Charge the battery pack while the computer is on. To charge the battery pack:

WARNING: Do *not* charge the computer battery pack onboard aircraft. Charging the battery pack may damage aircraft electronic systems.

1. Insert the battery pack into the computer.
2. Connect the computer to the AC adapter, an optional power adapter, or an optional expansion product, and then plug the adapter or device into external power. (The computer battery light is turned on.)
3. Leave the computer connected to external power until the battery pack is fully charged. (The computer battery light is turned off.)

Step 2: Discharging the Battery Pack

CAUTION: To prevent loss of information, save your work before beginning an unattended discharge procedure.

The computer must remain on throughout the discharge process. The battery pack can discharge whether or not you are using the computer, but the battery pack will discharge faster if the computer is in use.

If you use the computer occasionally during the discharge process described below and energy-saving time-outs have been disabled, expect the following performance from your system during the discharge:

- Any unsaved work from your current session will be lost when the battery pack is fully discharged and the computer is shut down.
- The system will not turn off a connected optional monitor.
- The system will not decrease hard drive speed while the computer is idle.
- System-initiated hibernation will not occur.

To fully discharge the battery pack:

1. Disable hibernation. To disable hibernation:

   Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab. Then clear the **Enable hibernation** check box.

2. Display the settings on the Power Schemes tab. To access the Power Schemes tab:

   Select **Start > Control Panel > Performance and Maintenance > Power Options > Power Schemes** tab.

3. Record all settings in the Plugged in column and all settings in the Running on batteries column, so you can reset them after calibration.
4. Use the drop-down lists to set each item in both columns to **Never**.
5. Click **OK**.
6. Disconnect the computer from the external power source, but do *not* turn off the computer.
7. Run the computer on battery power until the battery pack is fully discharged. The battery light begins to blink when the battery pack has discharged to a low-battery condition. When the battery pack is fully discharged, the computer is shut down.

Step 3: Recharging the Battery Pack

1. Plug the computer into external power and maintain the external power until the battery pack is fully recharged and the battery light is turned off.

   You can use the computer while the battery pack is recharging, but the battery pack will charge faster if the computer is turned off.

2. If the computer is turned off, turn on the computer when the battery light is turned off, indicating that the battery pack is fully charged.

3. Display the settings on the Power Schemes tab. To access the Power Schemes tab:

   Select **Start > Control Panel > Performance and Maintenance > Power Options > Power Schemes** tab.

4. Reenter the settings you recorded earlier for the items in the Plugged in column and the Running on batteries column.

5. Click **OK**.

CAUTION: After calibrating the battery pack, reenable hibernation. Failure to reenable hibernation may result in a complete battery discharge and potential information loss. To reenable hibernation: Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab. Select the **Enable hibernation** check box, and then click **Apply**.

Conserving Battery Pack Power

To extend the time that a battery pack can run the computer from a single charge, use the following battery conservation settings and procedures.

Conserving Power as You Work

To conserve power as you work:

- Prevent devices you are not using from drawing power from the computer. For example:
  - ❏ Turn off wireless and local area network (LAN) connections and close modem applications.
  - ❏ Disconnect from the computer any external devices that are not plugged into an external power source.
  - ❏ Stop or remove any optional external media cards you are not using.
  - ❏ Remove an optical disc that you are not using.
  - ❏ Disable or remove an inserted digital card.
  - ❏ Turn off a device connected to the S-Video–out jack.
- Use optional, externally powered speakers instead of the internal speakers whenever possible. When you use the internal speakers, minimize system volume. Volume can be adjusted with the volume buttons.
- Minimize screen brightness.
  - ❏ To decrease screen brightness, press the **fn+f7** hotkey.
  - ❏ To increase screen brightness, press the **fn+f8** hotkey.
- If you leave your work, initiate standby or hibernation, or shut down the computer.

Selecting Power Conservation Settings

To set the computer to use less power:

- Select a short wait for the screen saver and select a screen saver with minimal graphics and motion. To select a screen saver and a screen saver wait time, select **Start > Control Panel > Appearance and Themes > Display > Screen Saver** tab, and then follow the instructions on the screen.
- Select or create a power scheme that minimizes power use. For more information about using power schemes, refer to the "Using Power Schemes" section earlier in this chapter.

Storing a Battery Pack

CAUTION: To prevent damage to a battery pack, do not expose it to high temperatures for extended periods of time.

If the computer will be unused and disconnected from external power for more than 2 weeks, remove and store the battery pack.

High temperatures, which may be present in parked cars or some workplaces, accelerate the self-discharge rate of a stored battery pack. To prolong the charge of a stored battery pack, place it in a location that is cool and dry.

Calibrate a battery pack that has been stored for one month or more before using it.

Disposing of a Used Battery Pack

WARNING: To reduce the risk of fire or burns, do not disassemble, crush, or puncture a battery pack; short the external contacts on a battery pack; or dispose of a battery pack in fire or water. Do not expose a battery pack to high temperatures above 60°C (140°F). Replace only with the HP battery pack approved for this computer.

Refer to the *Regulatory, Safety, and Environmental Notices* guide for battery disposal information.

4

Multimedia

Internal Speakers

The internal speakers, identified in the following illustration, play sound in stereo from applications, the operating system, games, drive media, the Internet, and other sources.

If an external device, such as headphones, is connected to the audio-out jack, the internal speakers are disabled.

Volume Controls

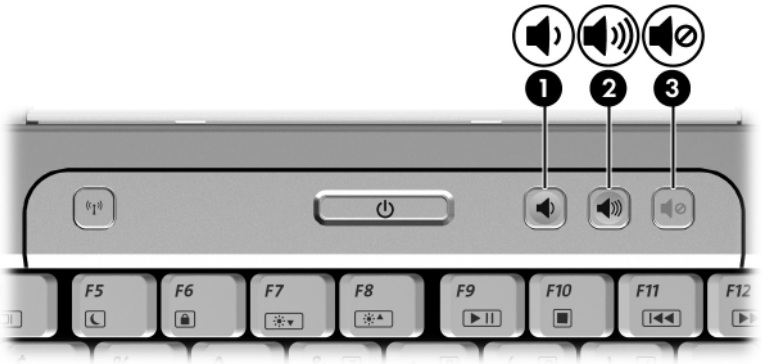
You can adjust volume with the volume buttons on the computer or the volume control software available in your operating system and in some multimedia applications. The volume mute button on the computer overrides all software volume settings.

- To access the operating system volume controls, select **Start > Control Panel > Sounds, Speech, and Audio Devices > Sounds and Audio Devices**, and then select the **Volume** tab.
  - To access additional sound quality settings, such as balance, select the **Advanced** button in the Device volume pane.
  - To display a volume icon on your taskbar, select the check box for **Place volume icon in the taskbar**, and then select **OK**.

- To adjust volume using the computer volume buttons:
  - ❏ To decrease volume, press the volume down button ❶.
  - ❏ To increase volume, press the volume up button ❷.
  - ❏ To mute or restore volume, press the volume mute button ❸.

When volume is muted, the mute light (on the volume mute button) is turned on. When volume is restored, the mute light is turned off.

Volume can also be adjusted within some applications.



External Audio Devices

Using the Audio-Out (Headphone) Jack

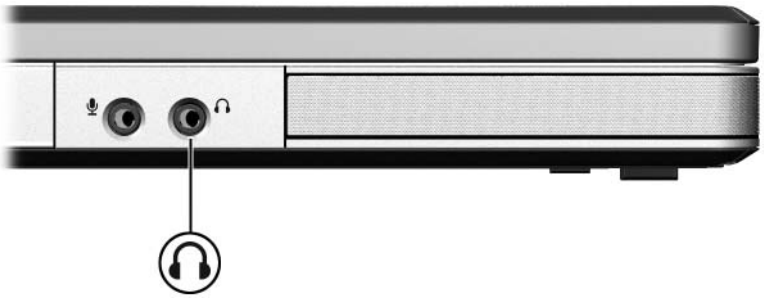
WARNING: To reduce the risk of personal injury, adjust the volume before putting on headphones.

CAUTION: To prevent possible damage to an external device, do not plug a monaural (single sound channel) plug into the audio-out jack.

The audio-out jack, sometimes called a *headphone* jack, connects optional headphones or externally-powered stereo speakers. The audio-out jack, identified in the following illustration, is also used to connect the audio functions of an audio/video device such as a television or VCR.

When you connect a device to the audio-out jack, use only a 3.5-mm plug.

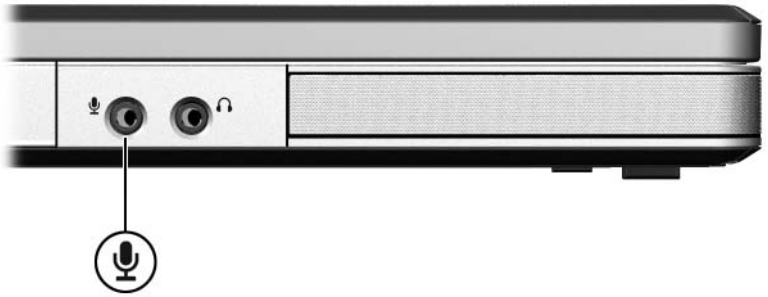
When a device is connected to the audio-out jack, the internal speakers are disabled.



Using the Audio-In (Microphone) Jack

The audio-in jack, identified in the following illustration, connects an optional monaural (single sound channel) microphone. The audio-in jack is sometimes called a *microphone* jack.

It is recommended that you use an electret condenser microphone with a 3.5-mm plug. If you connect a dynamic microphone, the recommended sensitivity may not be achieved.



External Video Devices

Connecting an S-Video Device

Connecting the Audio

The S-Video–out jack, available only on select models, supports video signals only.

If you are setting up a configuration that combines audio and video functions, such as playing a DVD movie on your computer and displaying it on your television, you need a standard 3.5-mm audio cable available from most computer or electronics retailers.

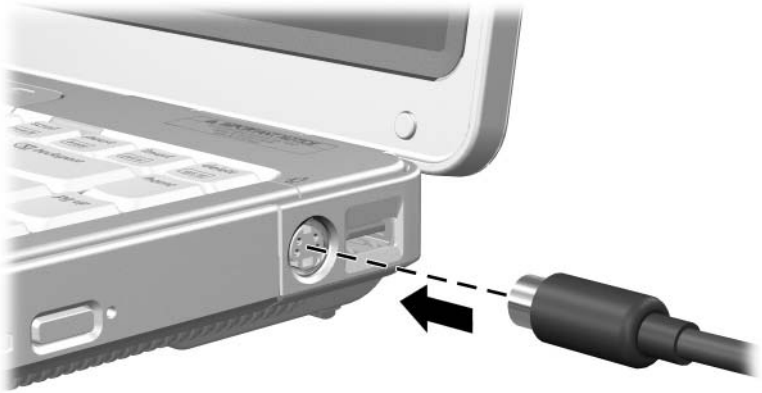
Connect the stereo end of the audio cable to the audio-out (headphone) jack on the computer. Connect the other end of the cable into the audio-in jack on the external device. For more information about the computer audio-out jack, refer to the "Using the Audio-Out (Headphone) Jack" section earlier in this chapter.

S/PDIF audio support is available only through an optional expansion product.

Connecting the Video

To transmit video signals through the S-Video–out jack, you need a standard S-Video cable, available from most computer or electronics retailers.

1. Connect one end of the S-Video cable into the computer S-Video–out jack, illustrated below.
2. Connect the other end of the cable into the S-Video–in jack on the external device.
3. Press the **fn+f4** keys to switch the image among display devices connected to the computer.



Displaying a Video Image

To display an image on the computer display or a video device display, both the computer and the video device must be turned on.

To switch the image between the computer display and the video device display:

» Repeatedly press the **fn+f4** hotkey. Pressing the **fn+f4** hotkey switches the image among the computer display, any connected displays, and simultaneous display.

For more information about **fn+f4** and other hotkeys, refer to the "Hotkeys" section in Chapter 2, "Keyboard and Touchpad."

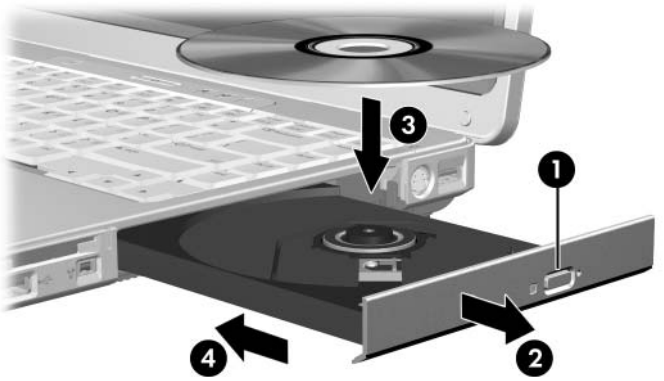
CD and DVD Procedures

Inserting an Optical Disc

1. Turn on the computer.
2. Press the release button ❶ on the drive bezel to release the media tray.
3. Pull out the tray ❷.
4. Hold the CD or DVD by the edges to avoid touching the flat surfaces, and position the disc over the tray spindle with the label side up.

   ✎ If the tray is not fully accessible, tilt the disc carefully to position it over the spindle.

5. Gently press the disc ❸ down onto the tray spindle until the disc snaps into place.
6. Close the media tray ❹.



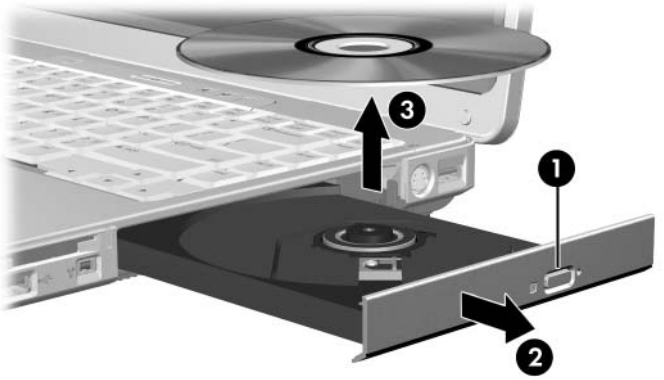
✎ After you insert a disc, a short pause is normal. If you have not selected a default media player, an AutoPlay dialog box opens. It prompts you to indicate how you want to use the media content.

Removing an Optical Disc (With Power)

If the computer is running on external or battery power:

1. Turn on the computer.
2. Press the release button ❶ on the drive bezel to release the media tray, and then pull out the tray ❷.
3. Remove the disc ❸ from the tray by gently pressing down on the spindle while lifting the outer edges of the disc. Hold the disc by the edges and avoid touching the flat surfaces.

   ✎ If the media tray is not fully accessible, tilt the disc carefully as you remove it.



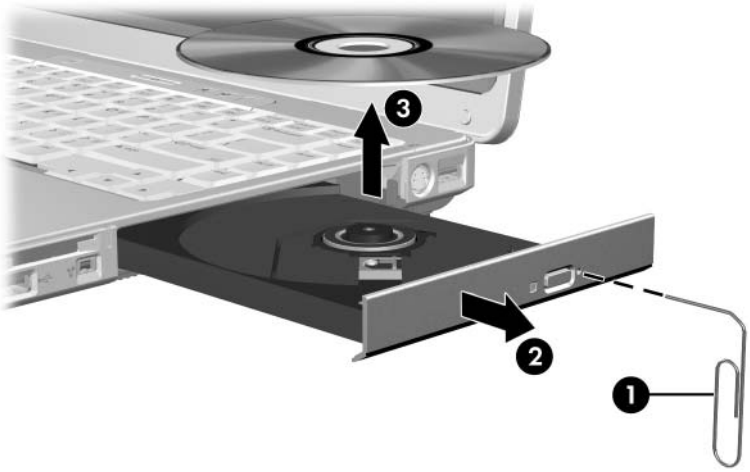
4. Close the media tray and place the disc in a protective case.

Removing an Optical Disc (Without Power)

If external or battery power is unavailable:

1. Insert the end of a paper clip ❶ into the release access in the front bezel of the drive.
2. Press in gently until the tray is released, and then pull out the tray ❷.
3. Remove the disc ❸ from the tray by gently pressing down on the spindle while lifting the outer edges of the disc. Hold the disc by the edges and avoid touching the flat surfaces.

   ✎ If the media tray is not fully accessible, tilt the disc carefully as you remove it.



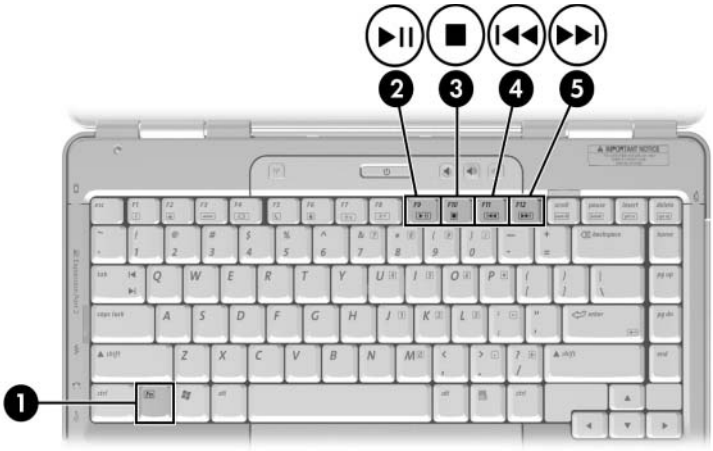
4. Close the media tray and place the disc in a protective case.

Using Media Activity Hotkeys

Media activity hotkeys are preset combinations of the **fn** key ❶ and 4 of the function keys. You can use these hotkeys to control the play of an audio CD or a DVD that is inserted in the optical drive. You can also use an optional remote control that is included with some computers.

To control the play of an inserted video CD, use the media activity controls in your video CD player application.

- To play, pause, or resume an inserted audio CD or a DVD, press the **fn+f9** hotkey ❷.
- To stop an inserted audio CD or a DVD that is playing, press the **fn+f10** hotkey ❸.
- To play the previous track of an audio CD or the previous chapter of a DVD that is playing, press the **fn+f11** hotkey ❹.
- To play the next track of an audio CD or the next chapter of a DVD that is playing, press the **fn+f12** hotkey ❺.



For more information about these and other hotkeys, refer to the "Hotkeys" section in Chapter 2, "Keyboard and Touchpad."

Setting AutoPlay Preferences

AutoPlay is the operating system feature that determines how the computer responds when you access files on a removable storage device such as a DVD-ROM drive, a DVD/CD-RW Combo Drive, or a DVD+RW/R and CD-RW Combo Drive.

AutoPlay default settings vary by computer model and configuration. For example, the first time you insert a CD or DVD into an optical drive and close the tray, the CD or DVD may begin playing or the AutoPlay pop-up window may be displayed. If the AutoPlay pop-up window is displayed, select your preferences as instructed on the screen.

The default AutoPlay settings can be changed. For example, you can set the computer to display a slide show of the pictures on a CD containing digital photographs, begin playing the first track of a CD containing music, or display the names of the folders and files on a CD containing data files. You can also set the computer to prompt you for a preference each time you insert a disc or to do nothing when you insert a disc.

At many AutoPlay settings, there may be a pause of several seconds while AutoPlay opens both the disc and the associated disc player application.

AutoPlay preferences are not available for diskette drives, but can be applied to most other removable storage devices. AutoPlay preferences can be set for a digital card such as a Secure Digital (SD) Memory Card, Memory Stick, Memory Stick Pro, xD-Picture Card, MultiMediaCard, or SmartMedia (SM) card.

To access AutoPlay settings:

1. Select **Start > My Computer**.
2. In the **Devices with Removable Storage** group, right-click an item such as a **DVD-ROM drive**.
3. Select **Properties**.
4. Select the **AutoPlay** tab and follow the on-screen instructions.

Protecting Playback

To prevent the loss of playback or playback quality:

- Save your work and close all open applications before playing a CD or a DVD.
- Connect or disconnect the computer from an optional expansion product *before* or *after* playing a disc, not *while* playing a disc.

To prevent the loss of playback while the computer is in Windows, do not initiate standby or hibernation while playing a disc.

If standby or hibernation is initiated while a drive medium such as a CD or DVD is in use

- Your playback may be interrupted.
- You may see the warning message "Putting the computer into hibernation or standby may stop the playback. Do you want to continue?" If the message is displayed, click **No**.
- You may need to restart the CD or DVD to resume playback.

Protecting a CD or DVD Write Process

CAUTION: To prevent loss of work and damage to a disc:

- Before writing to a disc, connect the computer to a reliable external power source. Do not write to a disc while the computer is running on battery power.
- Before writing to a disc, close all open applications (including screen savers and antivirus software) except the disc software you are using.
- Do not copy directly from a source disc to a destination disc or from a network drive to a destination disc. Instead, copy from a source disc or network drive to your hard drive, and then copy from your hard drive to the destination disc.
- Do not use the computer keyboard or move the computer while the computer is writing to a disc. The write process is sensitive to vibration.

Multimedia Software

Identifying Your Software

Your computer includes multimedia software that is preinstalled or provided on a disc. To view and access the preinstalled software on your computer:

» Select **Start > All Programs**.

or

» Select **Start > All Programs > Software Setup**. (You can also reinstall software from the Software Setup Utility.)

For details about using software included with your computer, refer to the software user guides. User Guides may be provided on CD, in print, or as online help files within the specific application. You may also refer to the software manufacturer's Web site.

Observing the Copyright Warning

It is a criminal offense, under applicable copyright laws, to make unauthorized copies of copyright-protected material, including computer programs, films, broadcasts, and sound recordings. do not use this computer for such purposes.

Installing Software

To install software from a CD that is included with the computer:

1. Connect the computer to a reliable AC outlet.
2. Close any open applications.
3. Insert the CD into the optical drive.
4. When the installation wizard opens, follow the installation instructions on the screen.
5. Restart the computer if prompted.

Repeat the installation procedure for all software you want to install.

Understanding DVD Region Settings

Most DVDs that contain copyrighted files also contain region codes. The region codes help protect copyrights internationally.

You can play a DVD containing a region code only if the region code on the DVD matches the region setting on your DVD drive.

If the region code on a DVD does not match the region setting on your drive, a "Playback Of Content From This Region Is Not Permitted" message is displayed when you insert the DVD. To play the DVD you must change the region setting on your DVD drive. DVD region settings can be changed through the operating system or through some DVD players.

Changing DVD Region Settings

CAUTION: The region settings on your DVD drive can be changed only 5 times.

- The region setting you select the fifth time becomes the permanent region setting on the DVD drive.
- The number of allowable region changes remaining on the drive is displayed in the **Changes Remaining** field in the **DVD Region** tab. The number in the field includes the fifth and permanent change.

To change settings through the operating system:

1. Open Device Manager by selecting **Start > My Computer**. Right-click in the window and select **Properties > Hardware** tab **> Device Manager**.
2. Select **DVD/CD-ROM drives**, right-click the DVD drive for which you want to change region settings, and then select **Properties**.
3. Make the desired changes on the DVD **Region** tab.
4. Select **OK**.

For additional information, refer to the Windows operating system Help and Support.

5

Wireless (Select Models Only)

Wireless Features

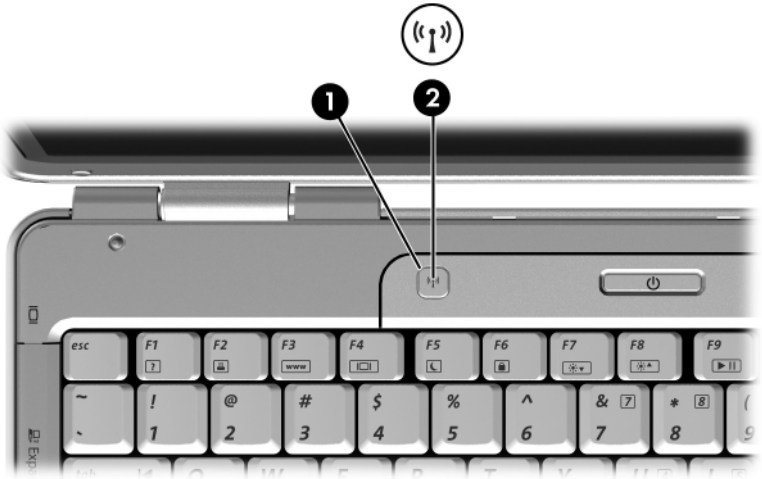
If your computer is equipped with an 802.11 wireless device and/or a Bluetooth wireless device, you have a wireless computer.

- An 802.11 wireless computer can connect to wireless local area networks (WLANs) in corporate offices, your home, and public places such as airports, restaurants, coffee shops, hotels, and universities. Hotspots are public places where you can access a wireless network. Contact your Internet service provider (ISP) or search the Web for a list of hotspots near you.
- A Bluetooth wireless computer can connect to other Bluetooth wireless-enabled devices such as computers, phones, printers, headsets, speakers, and cameras.

Wireless Controls

Your computer has a wireless button that can enable and disable 802.11 and Bluetooth wireless devices and the wireless light to indicate the state of the wireless devices.

The following illustration shows the wireless button ❶ and wireless light ❷.



You can enable and disable the wireless devices with the wireless button. You can also enable and disable the wireless devices in the Setup Utility.

Select models also include the Wireless Assistant utility. With the Wireless Assistant, you can turn on or off the 802.11 or Bluetooth devices individually. For more information, refer to the Wireless Assistant online Help.

You cannot use the wireless button or the Wireless Assistant to control the wireless devices if they are disabled in the Setup Utility.

802.11 Wireless Devices (Select Models Only)

A computer with an 802.11 wireless device can access a wireless local area network (commonly referred to as wireless network, wireless LAN, or WLAN), which is composed of other computers and accessories linked by a wireless router or a wireless access point.

- A large-scale WLAN, such as a corporate or public WLAN, typically uses wireless access points that can handle a large number of computers and accessories and can separate critical network functions.
- A home or small office WLAN typically uses a wireless router, which enables several wireless and wired computers to share an Internet connection, a printer, and files without additional pieces of hardware or software.

  ✎ The terms *wireless access point* and *wireless router* are often used interchangeably.

Computers with 802.11 wireless devices may support 1 or more of 3 industry standards:

- 802.11b supports data rates of up to 11 Mbps and operates at a frequency of 2.4 GHz.
- 802.11g supports data rates of up to 54 Mbps and operates at a frequency of 2.4 GHz. An 802.11g WLAN device is backward compatible with 802.11b devices, so they can operate on the same network.
- 802.11a supports data rates of up to 54 Mbps and operates at a frequency of 5 GHz.

  ✎ 802.11a is *not* compatible with 802.11b and 802.11g.

For information on identifying the type of wireless device in your computer, refer to "Identifying an 802.11 Wireless Device."

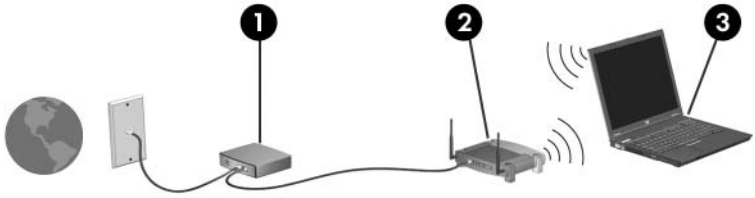
Setting Up a WLAN in Your Home

Microsoft Windows XP supports WLAN configuration with the Windows Network Configuration feature.

To set up a WLAN and connect to the Internet in your home, you need the following equipment:

- A broadband modem (either DSL or cable) ❶ and high-speed Internet service purchased from an Internet service provider (ISP).
- A wireless router (purchased separately) ❷.
- Your wireless computer ❸.

The illustration below shows an example of a wireless network installation that is connected to the Internet.



As your network grows, additional wireless and wired computers can be connected to the network to access the Internet.

If you need technical assistance to install your home WLAN, contact the router manufacturer or your ISP.

Connecting to a WLAN in Your Home

To connect to a WLAN connection in your home:

1. Be sure that your 802.11 wireless device is on. When the wireless device is on, the wireless light is turned on. If the wireless light is off, turn on the wireless device.
2. Be sure that your router is correctly installed and configured. For instructions, refer to your router user guides.
3. Use the Wireless Network Connection feature of Microsoft Windows XP to connect your computer to the WLAN.

Functional range for subsequent WLAN connections will vary, depending on your computer WLAN implementation, router manufacturer, and interference from walls and other electronic devices.

For more information about connecting to a WLAN in your home:

- Refer to information from your ISP and the user guides included with your wireless router and other WLAN equipment.
- Access the information and Web site links provided in the Help and Support Center.

Connecting to a Public WLAN

Contact your ISP or search the Web for a list of public WLANs near you.

When you are within range of a public WLAN, a Wireless Network Connection interactive message is displayed at the bottom of your computer screen. Check with each public WLAN location for cost and connection requirements.

Using Wireless Security Features

When you set up your home WLAN or access an existing public WLAN, always be sure that security features are protecting the WLAN. If you do not enable security on your WLAN, an unauthorized wireless user can access your information and use your Internet connection without your knowledge.

To set security features for the computer, click the Wireless Network Connection icon located in the notification area, at the far right of the taskbar.

To set security features for the router, refer to the user guide included with the router.

The most common security levels are Wi-Fi Protected Access (WPA)-Personal and Wired Equivalent Privacy (WEP). In addition to enabling WPA-Personal or WEP security encryption on the router, you may want to use one or more of the following security measures:

- Change the default network name (SSID) and password.
- Use a firewall.
- Set security on your Web browser.
- Enable MAC address filtering on the router.

Identifying an 802.11 Wireless Device

You may need to know the name of the integrated 802.11 wireless device installed in your computer. To identify an 802.11 wireless device:

1. Select **Start > Control Panel**.
2. Click **Network and Internet Connections**.
3. Click **Network Connections**.
4. Under **LAN or High-Speed Internet**, identify the wireless network connection from the list that is displayed. The device is listed under the **Device Name** column.

If no wireless network connection is listed, either your computer does not have an integrated 802.11 wireless device, or the driver for the 802.11 wireless device is not properly installed.

To Learn More

For more information about wireless mobile computing, visit http://www.hp.com/go/wireless.

This site is available in English only.

Bluetooth Wireless Devices (Select Models Only)

A Bluetooth wireless device provides short-range wireless communications that replace the physical cable connections that traditionally link electronic devices such as

- Network access points.
- Computers (desktop, notebook, PDA).
- Phones (cellular, cordless, smart phone).
- Imaging devices (printer, camera).
- Audio devices (headset, speakers).

The devices are represented in the Bluetooth for Windows software by icons.

The Bluetooth for Windows software provides the following functions:

- Personal Information Management (PIM) item transfer—Enables the exchange of information files such as business cards, calendar items, notes, and message items between Bluetooth computers or devices.
- PIM synchronization—Synchronizes PIM information between a Bluetooth wireless device and a notebook, PDA, or cell phone using Bluetooth.
- File Transfer—Enables the exchange of files between Bluetooth computers or devices.
- Network access (Personal Area Networking Profile)—Enables 2 or more Bluetooth devices to form an ad hoc (peer-to-peer) network. Provides a mechanism that enables a Bluetooth device to access a remote network through a network access point. The network access points can be traditional LAN data access points or group ad hoc networks that represent a set of devices that are attached only to one another.

- Dial-up networking—Connects Bluetooth devices to the Internet.
- Bluetooth serial port—Transfers data over the Bluetooth link using a virtual COM port.
- Hands-Free—Enables a vehicle-embedded, hands-free unit or a computer serving as a hands-free unit to establish a wireless connection to a cellular phone and to act as the Bluetooth cellular phone audio input and output mechanism.
- Basic imaging—Provides a wireless connection between a Bluetooth-enabled camera and other Bluetooth devices. The camera can be controlled remotely by a computer, and images can be transferred from a camera to be stored on a computer or to be printed.
- Human interface device—Provides a wireless connection to other Bluetooth devices, such as keyboards, pointing devices, gaming devices, and remote monitoring devices.
- Fax—Provides a Bluetooth connection that enables a computer to send or receive a fax message using a Bluetooth cellular phone or modem.
- Headset—Provides a wireless connection between a headset and a computer or cellular phone. The headset acts as the device's audio input and output mechanism and increases mobility.

6

Security

Security Features

Security solutions are designed to act as deterrents, but they may not be able to deter software attacks or prevent the computer from being mishandled or stolen.

Standard security features provided by the Windows operating system and the non-Windows Setup Utility (accessed by pressing **f10** at startup) can protect your personal settings and information from a variety of risks.

It is recommended that you follow the procedures described later in this guide for using

- Passwords
- Antivirus software
- Firewall software
- Critical security updates
- Optional security cable

To Protect Against	Use This Security Feature
Unauthorized use of the computer	■ QuickLock ■ Power-on password
Unauthorized access to the Setup Utility, BIOS settings and other system identification information	Administrator password
Computer viruses	Antivirus software
Unauthorized access to information	■ Firewall software ■ Windows updates
Ongoing or future threats to the computer	Critical security updates from Microsoft
Unauthorized access to a Windows user account	User password
Unauthorized removal of the computer	Security cable slot (used with an optional security cable) For additional information on the security cable slot, refer to "Optional Security Cable."

QuickLock

QuickLock protects your computer by displaying the Windows operating system Log On window. While the Log On window is displayed, the computer cannot be accessed until a Windows user password or Windows administrator password is entered.

Before you can use the QuickLock feature, you must set a Windows user password or Windows administrator password. To set a Windows password, refer to the Help and Support Center.

Then

- To initiate QuickLock, press **fn+f6**.
- To exit QuickLock, enter your Windows user password or Windows administrator password.

Types of Passwords

A password is a group of characters that you set to secure your computer information. Several types of passwords can be set, depending on how you want to control access to your information. Passwords can be set in Windows or in the non-Windows Setup Utility preinstalled on the computer.

CAUTION: To prevent being locked out of the computer, record each password you set. Because most passwords area not displayed as they are set, changed, or deleted, it is essential to write down each password immediately, and store it in a secure place.

The following tables list commonly used Setup Utility and Windows passwords and describe their functions.

Passwords Set in Windows

Passwords	Function
Administrator password	Protects administrator-level access to computer contents. This password cannot be used to access the Setup Utility contents.
User password	Protects access to a Windows user account. It also protects access to the computer contents and must be entered when the computer is resumed from standby or restored from hibernation.

Passwords Set in the Setup Utility

Passwords	Function
Administrator password	■ Protects access to the Setup Utility. ■ After it is set, this password must be entered each time you access the Setup Utility. △ If you forget the administrator password, you cannot access the Setup Utility.
Power-on password	■ Protects access to the computer contents. ■ After this password is set, it must be entered each time the computer is turned on, restarted, or restored from hibernation. △ If you forget the power-on password, you cannot turn on the computer, restart, or restore from hibernation.

Coordinating Passwords

A Setup administrator password and a Windows administrator password have different functions. A Windows administrator password cannot be used to access Setup, and a Setup administrator password cannot provide administrator-level access to your computer contents.

Setup Utility and Windows passwords function independently. You must use a Setup Utility password at a Setup Utility password prompt and a Windows password at a Windows password prompt. For example:

- If a Setup Utility power-on password is set, the power-on password (not a Windows password) must be entered when the computer is turned on, restarted, or restored from hibernation.
- If a Windows standby password is set, the Windows standby password (not a Setup Utility power-on password) must be entered when the computer is resumed from standby or restored from hibernation.

Guidelines for Setting Passwords

You can use the same password for a Setup Utility feature that you use for a Windows security feature. You can also use the same password for more than one Setup Utility feature.

A password set in the Setup Utility:

- Can be any combination of up to 8 letters and numbers and is not case sensitive.
- Must be set and entered with the same keys. For example, a password set with keyboard number keys will not be recognized if it is thereafter entered with embedded numeric keypad number keys.

  ✎ Select models include a separate numeric keypad, which functions exactly like the keyboard number keys.

- A password set in the Setup Utility must be entered at a Setup Utility prompt. A password set in Windows must be entered at a Windows prompt.

Tips for creating and saving passwords

- When creating passwords, follow requirements set by the program.
- Write down your passwords and store them in a secure place away from the computer.
- Do not store passwords in a file on your computer.
- Do not use your name or other personal information that could be easily discovered by an outsider.

Administrator Password

The administrator password protects the configuration settings and system identification information in the Setup Utility. After this password is set, it must be entered to access the Setup Utility.

The administrator password

- Is not interchangeable with an administrator password set in Windows, although both passwords can be identical.
- Is not displayed as it is set, entered, changed, or deleted. Be sure you record the password and store it in a secure place.

Managing an Administrator Password

To set, change, or delete this password:

1. Open the Setup Utility by turning on or restarting the computer, and then pressing **f10** while the Setup message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **Security > Administrator Password,** and then press **enter**.
   - ❏ To set an administrator password, type your password in the **Enter New Password** and **Confirm New Password** fields, and then press **enter**.
   - ❏ To change an administrator password, type your current password in the **Enter Current Password** field, type the new password in the **Enter New Password** and **Confirm New Password** fields, and then press **enter**.
   - ❏ To delete an administrator password, type your current password in the **Enter Password** field, and press **enter** 4 times.
3. To save your preferences and exit the Setup Utility, press **f10** and follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Entering an Administrator Password

At the **Enter Password** prompt, type your administrator password (using the same keys you used to set the password), and then press **enter**. After 3 unsuccessful attempts to enter the administrator password, you must restart the computer and try again.

Power-On Password

The power-on password prevents unauthorized use of the computer. After this password is set, it must be entered each time the computer is turned on, restarted, or restored from hibernation. A power-on password is not displayed as it is set, entered, changed, or deleted.

Managing a Power-On Password

To set, change, or delete the password:

1. Open the Setup Utility by turning on or restarting the computer, and then pressing **f10** while the Setup message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **Security > Power-On password**, and then press **enter**.
   - ❏ To set a power-on password, type the password in the **Enter New Password** and **Confirm New Password** fields, and then press **enter**.
   - ❏ To change a power-on password, type the current password in the **Enter Current Password** field, type the new password in the **Enter New Password** and **Confirm New Password** fields, and then press **enter**.
   - ❏ To delete a power-on password, type the current password in the **Enter Current Password** field, and then press **enter** 4 times.
3. To save your preferences and exit the Setup Utility, press **f10**, and then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.

Entering a Power-On Password

At the **Enter Password** prompt, type your password (using the same keys you used to set the password), and then press **enter**. After 3 unsuccessful attempts to enter the password, you must restart the computer and try again.

Antivirus Software

When you use the computer for e-mail, network, or Internet access, you expose the computer to computer viruses. Computer viruses can disable your operating system, applications, or utilities or cause them to function abnormally. Antivirus software can detect most viruses, destroy them, and in most cases, repair damage they have caused.

To protect your computer against viruses, it is recommended that you use antivirus software. To provide protection against newly discovered viruses, the antivirus software must be updated.

Antivirus software is preinstalled on the computer.

- The software includes free updates for a limited period of time. It is strongly recommended that you protect your computer against new viruses by purchasing extended update service.
- Instructions for using and updating antivirus software and for purchasing extended update service are provided with the application.
- To view and access the software preinstalled on your computer, select **Start > All Programs**.

Critical Security Updates for Windows XP

CAUTION: To protect your computer from security breaches and computer viruses, install the online critical updates from Microsoft as soon as you receive an alert.

Additional updates to your operating system and other software may have become available *after* your computer was shipped. To be certain that all available updates are installed on your computer:

- Run Windows Update monthly to install the latest software from Microsoft.
- Use the update link in the Help and Support Center. Updates to Windows and Microsoft applications are released periodically. You can obtain updates from the Microsoft Web site as they are released and through the updates link in the Help and Support Center.

Firewall Software

When you use the computer for e-mail, network, or Internet access, it is possible for unauthorized persons to obtain information about you, your computer, and your information. To protect your privacy, it is recommended that you use firewall software.

Firewalls monitor all incoming and outgoing traffic on your computer by including features such as logging and reporting, automatic alarms, and user interfaces for configuring the firewall.

Your computer comes with preinstalled firewall software. Refer to the firewall user guides or contact the firewall manufacturer.

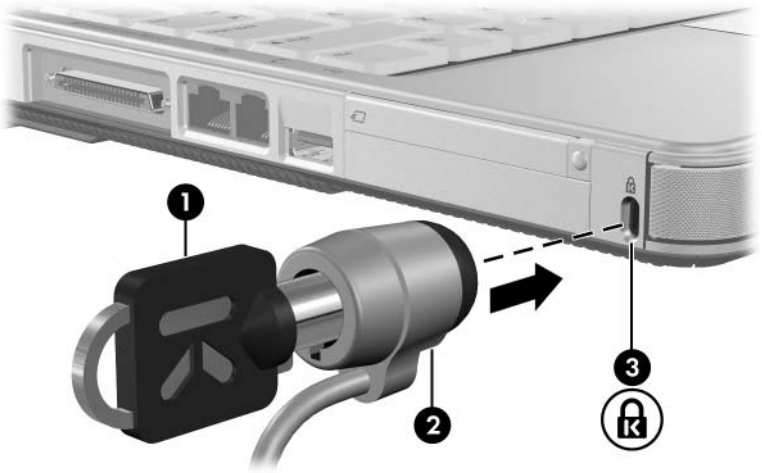
Under some circumstances a firewall can block access to Internet games, interfere with printer or file sharing on a network, or block authorized e-mail attachments. To temporarily solve the problem, disable the firewall, perform the task that you want to perform, and then reenable the firewall. To permanently resolve the problem, reconfigure the firewall.

Optional Security Cable

The security cable is designed to act as a deterrent, but may not prevent the computer from being mishandled or stolen.

To install a security cable:

1. Loop the security cable around a secured object.
2. Insert the key ❶ into the cable lock ❷.
3. Insert the cable lock into the security cable slot on the computer ❸, and then lock the cable lock with the key.



7

Hardware Upgrades and Replacements

Device Connections

Connecting a Powered Device

To connect the computer to an optional external device that has a power cord:

1. Be sure the device is turned off.
2. Connect the device to the jack or jack on the computer specified by the device manufacturer.
3. Plug the device power cord into a grounded AC outlet.
4. Turn on the device.

If a properly connected monitor or other display device does not display an image, try pressing the **fn+f4** hotkey to switch the image to the new device.

To disconnect a powered external device from the computer:

1. Turn off the device.
2. Disconnect the device from the computer.

Connecting a USB Device

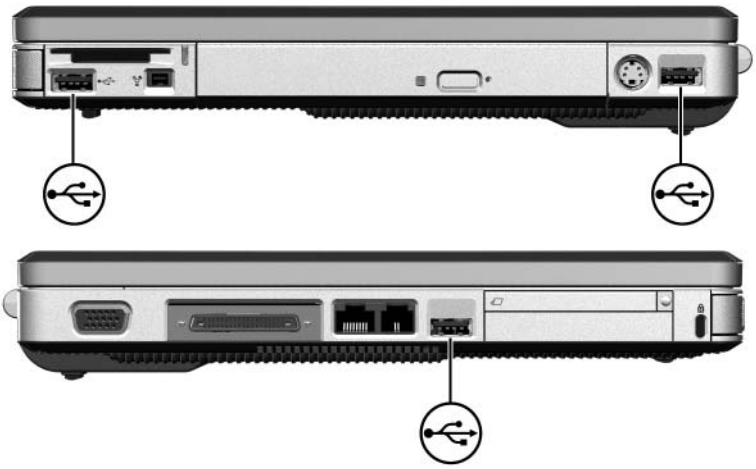
A device connected to the computer by USB can be used when the computer is running Windows.

Universal Serial Bus (USB) is a hardware interface that can be used to connect an external device such as a USB keyboard, mouse, drive, printer, scanner, or hub to the computer or an optional expansion product.

A hub is a connecting device that can be either powered or unpowered. USB hubs can be connected to a USB port on the computer or to other USB hubs. Hubs support varying numbers of USB devices and are used to increase the number of USB devices in the system.

- Powered hubs must be connected to external power.
- Unpowered hubs must be connected either to a USB port on the computer or to a port on a powered hub.

The 3 USB ports on the computer support USB 2.0-compliant, USB 1.1-compliant, and USB 1.0-compliant devices.



CAUTION: To prevent damage to the USB connectors, use minimal force to insert a USB device.

To connect a USB device to the computer, slide the USB connector into the USB port. (The operating system will issue a sound to indicate that a device has been detected.)

The first time you connect a USB device, the "New Hardware Found" message is displayed in the lower-right corner of the display.

Stopping a USB device

CAUTION: To prevent loss of information or an unresponsive system, stop a USB device before removing it.

To stop a USB device:

1. Double-click the **Safely Remove Hardware** icon in the notification area (at the far right of the taskbar).
2. Click the USB device listing.

To display the **Safely Remove Hardware** icon, click **Show Hidden Icons** in the notification area.

Required USB Software

A USB device functions in the same way as a comparable non-USB device, with one exception. By default, USB devices do not function unless an operating system that supports USB is installed in the computer.

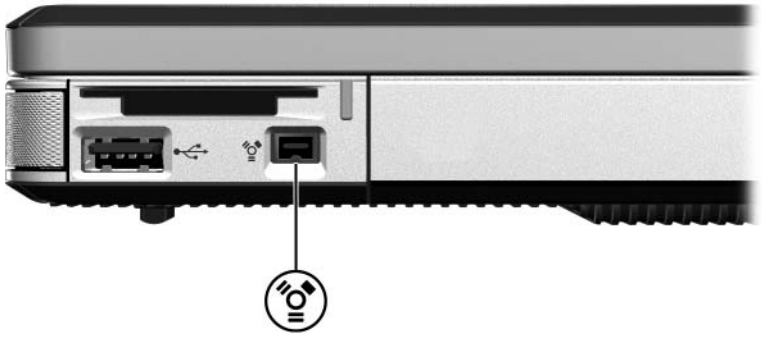
Some USB devices may require additional support software, which is usually included with the device. For more information and software installation instructions, refer to the user guides included with the device.

Connecting a 1394 Device

IEEE 1394 is a hardware interface that can be used to connect a high-speed multimedia or storage device to the computer. Scanners, digital cameras, and digital camcorders often require a 1394 connection.

You may have to load device-specific drivers and other software before using some 1394 devices. For information about device-specific software, refer to the device user guides or to the Web site of the device manufacturer or provider.

The computer 1394 port, illustrated below, supports IEEE 1394 devices.



CAUTION: To prevent damage to the 1394 port connectors, use minimal force to insert a 1394 device.

To connect a 1394 device to the computer, slide the 1394 connector into the 1394 port. (The operating system will issue a sound to indicate that a device has been detected.)

The first time you insert a 1394 device, the "New Hardware Found" message is displayed in the lower-right corner of the display.

Stopping a 1394 Device

CAUTION: To prevent loss of information or an unresponsive system, stop a 1394 device before removing it.

To stop a 1394 device:

1. Double-click the **Safely Remove Hardware** icon in the notification area (at the far right of the taskbar).
2. Click the 1394 device listing.

To display the Safely Remove Hardware icon, click **Show Hidden Icons** in the notification area.

Connecting a Communication Device

For information about using an optional wireless device, refer to Chapter 5, "Wireless (Select Models Only)."

For information about using the Network Service Boot to connect the computer to a PXE (Preboot Execution Environment) server during startup, refer to the "Using Advanced Setup Utility Features" section in Chapter 8, "Software Updates and Recovery and System Software."

The Help and Support Center provides communication information that includes instructions, tutorials, and wizards that can help you set up or troubleshoot a variety of connections.

Digital Cards

The Memory Reader in the computer can support:

- Memory Stick and Memory Stick Pro
- xD-Picture Card (XD)
- MultiMediaCard
- SmartMedia (SM) card
- Secure Digital (SD) Memory Card

Digital cards are often used for digital storage on cameras, camcorders, and other handheld devices.

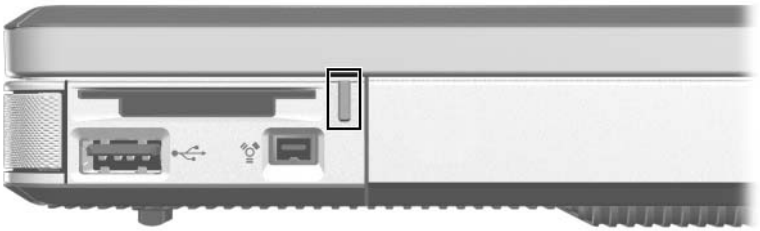
CAUTION: To avoid damaging your digital card or your computer, do not insert any type of adapter into your Memory Reader.

You can set the computer to open the files on a digital card in ways you specify. For example, you could set a digital card to open with a slide show of the photographs it contains. For instructions, refer to the "Protecting Playback" section in Chapter 4, "Multimedia."

The Memory Reader light and the Memory Reader described in the following sections are available only on select models.

Using the Memory Reader Light

The Memory Reader light is turned on when an inserted digital card is being accessed. The Memory Reader light is turned off when an inserted digital card is inactive or when the Memory Reader is vacant.



Inserting an Optional Digital Card

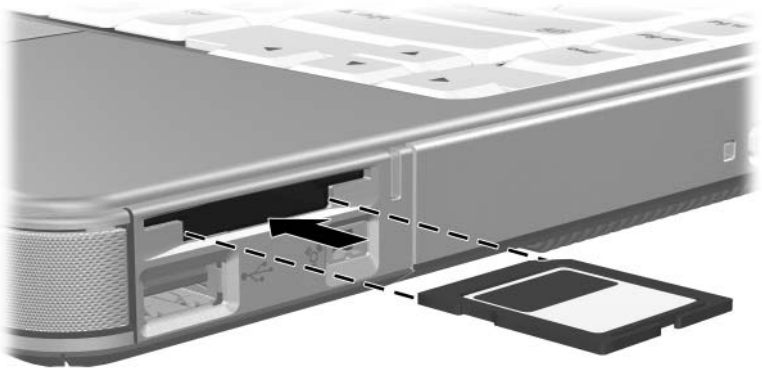
CAUTION: To prevent damage to digital card connectors, use minimal force when inserting a digital card into the Memory Reader.

To insert a digital card:

1. Hold the card label-side up, with the connectors facing the computer.
2. Slide the card into the Memory Reader until the card is seated.

   The operating system will issue a sound to indicate that a device has been detected.

   The first time you insert a digital card, the "New Hardware Found" message is displayed in the lower-right corner of the display.



Removing a Digital Card

CAUTION: To prevent loss of information and an unresponsive system, stop the digital card before removing it.

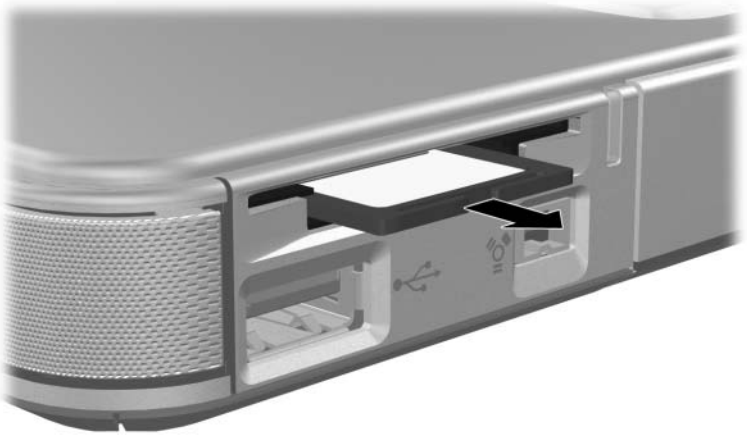
To remove a digital card:

1. Close all files and applications and complete all activities that are associated with the card. (To stop a data transfer, select the **Cancel** button in the Windows Copying window.)
2. Stop the digital card:
   a. Double-click the **Safely Remove Hardware** icon in the notification area, at the far right of the taskbar.

      To display the Safely Remove Hardware icon, click **Show hidden icons** in the notification area.

   b. Click the digital card listing, and then click **Stop**.

3. Select the **My Computer** icon on the Windows Desktop.
4. Right-click the drive assigned to the card, and then select **Eject**. (The card is stopped but is not released from the Memory Reader.)
5. Pull the card out of the slot.



ExpressCards

What Is an ExpressCard?

The ExpressCard is a next-generation, high-performance PC Card which must be inserted in the ExpressCard slot.

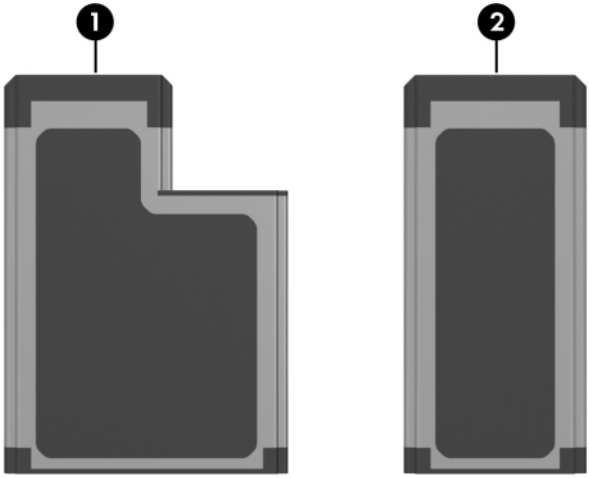
Like standard PC cards, ExpressCards are designed to conform to the standard specifications of the Personal Computer Memory Card International Association (PCMCIA).

Selecting an ExpressCard

ExpressCards use one of 2 interfaces and are available in 2 sizes. The ExpressCard slot on the computer supports both interfaces and both sizes. For example, you can use:

- An ExpressCard with either a USB interface or a PCI Express interface.
- A full-size ExpressCard, called *ExpressCard/54* ❶, or a smaller ExpressCard, called *ExpressCard/34* ❷.

The ExpressCard procedures described in the following sections are the same for both interfaces and sizes.



Configuring an ExpressCard

CAUTION: To prevent loss of support for other ExpressCards, install only the software required for your device. If you are instructed by the ExpressCard manufacturer to install device drivers:

- Install only the device drivers for your operating system.
- Do not install other software, such as card services, socket services, or enablers, supplied by the ExpressCard manufacturer.

Inserting an ExpressCard

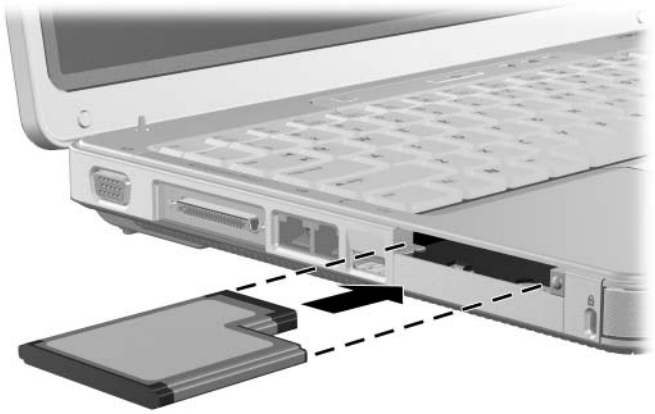
CAUTION: To prevent damage to the ExpressCard connectors:

- Use minimal force when inserting an ExpressCard into an ExpressCard slot.
- Do not move or transport the computer while an ExpressCard is inserted.

1. Position the ExpressCard label-side up with the connectors facing the computer.
2. Gently slide the card into the slot until the card is seated.

   The operating system will issue a sound to indicate that a device has been detected.

   ✎ The first time you insert an ExpressCard, the "Found New Hardware" message is displayed in the notification area, at the far right of the taskbar.



Stopping or Removing an ExpressCard

CAUTION: To prevent loss of work or an unresponsive system, stop an ExpressCard before removing it.

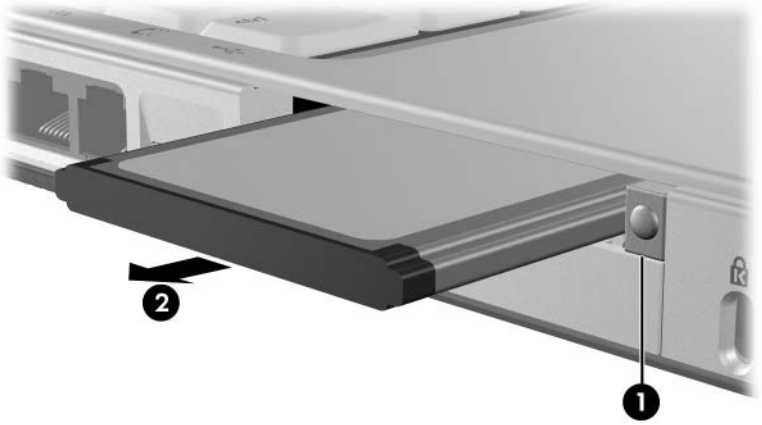
To stop or remove an ExpressCard:

1. Close all applications and complete all activities that are associated with the ExpressCard.
2. To stop the ExpressCard:
   a. Double-click the **Safely Remove Hardware** icon in the notification area, at the far right of the taskbar.

      To display the Safely Remove Hardware icon, click **Show Hidden Icons** in the notification area.

   b. Click the ExpressCard listing, and then click **Stop**.

3. To remove the ExpressCard
   a. Press the ExpressCard slot eject button ❶. (This action extends the button into position for releasing the ExpressCard.)
   b. Press the eject button again to release the ExpressCard.
   c. Gently pull the card ❷ out of the slot.



An inserted ExpressCard uses power even when idle. To conserve power, stop or remove an ExpressCard when it is not in use.

Drives

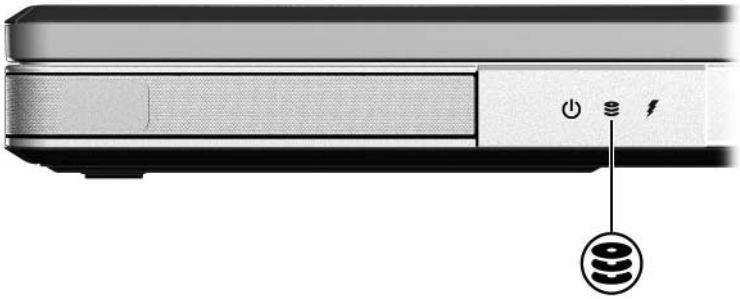
Adding a Drive to the System

The internal hard drive and optical drive are standard features of the computer. The type of optical drive varies by computer model.

An optional drive can be added to the system by connecting it, as instructed in the drive user guides, to one of the USB ports or to the 1394 port (select models only). Storage capacity can also be added with an optional ExpressCard or a digital card such as a Secure Digital (SD) Memory Card.

Using the IDE Drive Light

Internal hard drive or optical drive activity is indicated by the IDE (Integrated Drive Electronics) drive light.



Caring for Drives

Drives are fragile components that must be handled carefully. Follow the guidelines in this section to protect your drives.

CAUTION: To prevent damage to the computer or a drive and loss of work:

- Initiate standby before you move a computer or external hard drive from one location to another.
- Before handling a drive, discharge yourself from static electricity by touching a grounded metal object.
- Do not touch the connector pins on a removable drive or on the computer.
- Excessive force can damage drive connectors. Do not use excessive force when inserting a drive into a drive bay.
- Handle a drive carefully; do not drop or compress the drive.
- Before removing or inserting a drive, shut down the computer. If you are unsure whether the computer is off or in hibernation, turn the computer on, and then shut it down through the operating system.
- Avoid exposing a drive to magnetic fields. Security devices with magnetic fields include airport walk-through devices and security wands. The airport security devices that check carry-on luggage, such as conveyor belts, use x-rays instead of magnetism and will not damage a drive.
- Do not type on the keyboard or move the computer while the drive is writing to a medium. The write process is sensitive to vibration.
- When the battery pack is the only source of power, be sure that the battery pack is sufficiently charged before writing to a medium.
- Avoid exposing a drive to temperature or humidity extremes.
- Avoid exposing the drive to liquids. Do not spray it with cleaning products.
- If you must mail a drive, place the drive in a bubble-pack mailer or other suitable protective packaging, and label the package "FRAGILE."

Replacing the Internal Hard Drive

The hard drive in the hard drive bay is the internal hard drive. Remove the internal hard drive only for repair or replacement.

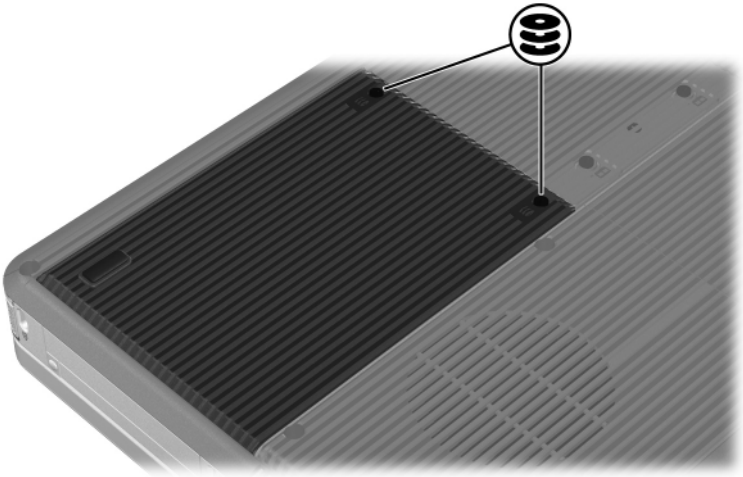
CAUTION: To prevent system lockup and loss of information

- Shut down the computer before removing the hard drive from the hard drive bay. Do not remove the hard drive while the computer is in standby or hibernation.
- If you are not sure whether the computer is off or in hibernation, turn on the computer by pressing the power button. Then shut down the computer through the operating system.

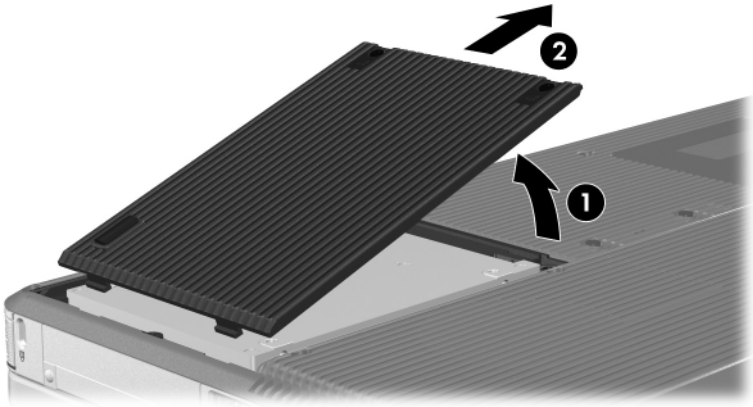
To replace the internal hard drive:

1. Save your information.
2. Shut down the computer and close the display.
3. Turn the computer upside down.

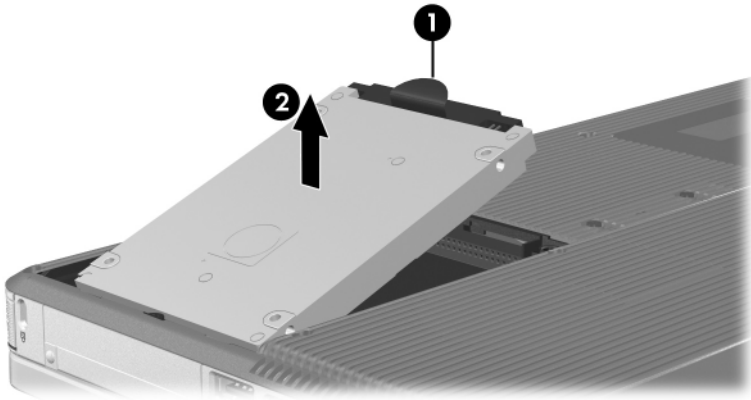
4. Loosen the 2 hard drive security screws.



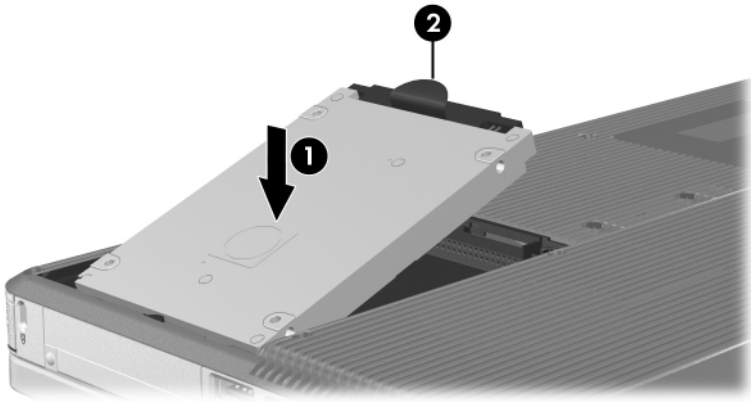
5. To remove the hard drive cover and expose the hard drive tab, lift the cover upward ❶ and away from the computer ❷.



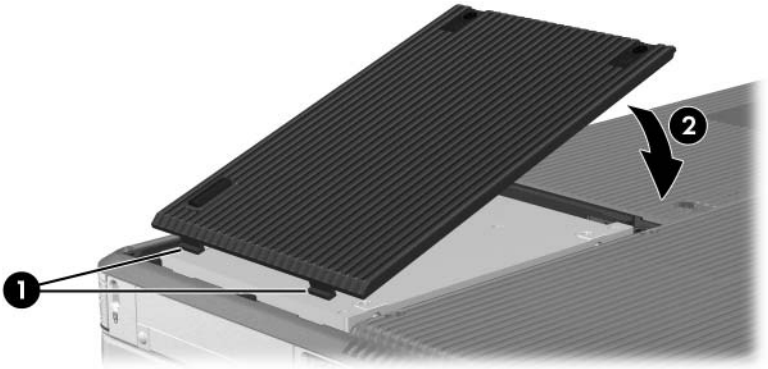
6. To remove the hard drive, pull upward on the hard drive tab ❶ to release the hard drive, and then lift the hard drive ❷ out of the hard drive bay.



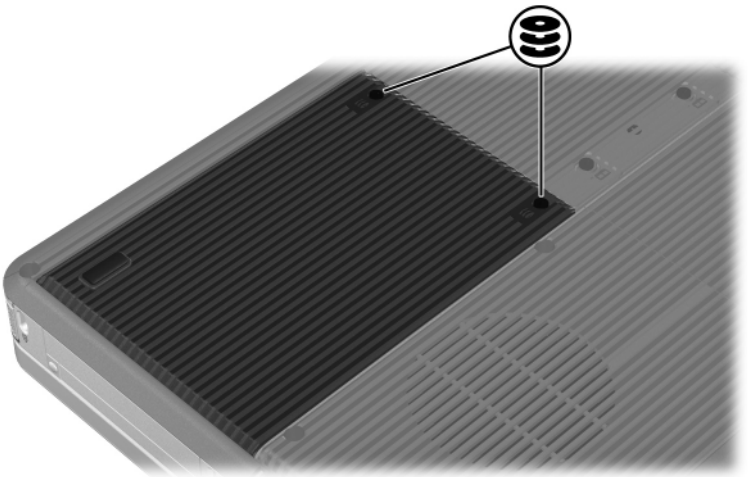
7. To insert the replacement hard drive, tilt the connector edge of the hard drive ❶ downward, and then lower the hard drive into the hard drive bay until it is seated ❷.



8. Replace the hard drive cover.
   a. Place the cover ❶ over the hard drive bay.
   b. Slide the cover slightly toward the right side of the computer until the cover is seated ❷.



9. Tighten the 2 hard drive security screws.



Memory

The computer has 2 memory slots. Depending on your computer model, either one or both memory slots may contain a replaceable memory module.

Increasing Memory

You can increase the amount of RAM (random access memory) in the computer by adding memory modules to vacant memory slots or by replacing installed memory modules.

When RAM is increased, the operating system increases the hard drive space reserved for the hibernation file. Before you increase RAM, it is recommended that you be sure that your hard drive has enough free space for the larger hibernation file.

- To display the amount of RAM in the system, visit the Help and Support Center.
- To display both the amount of free space on your hard drive and the amount of space required by the hibernation file:

  Select **Start > Control Panel > Performance and Maintenance > Power Options > Hibernate** tab.

Removing or Inserting a Memory Module

WARNING: To reduce the risk of electrical shock and damage to the equipment unplug the power cord, and remove all battery packs before installing a memory module.

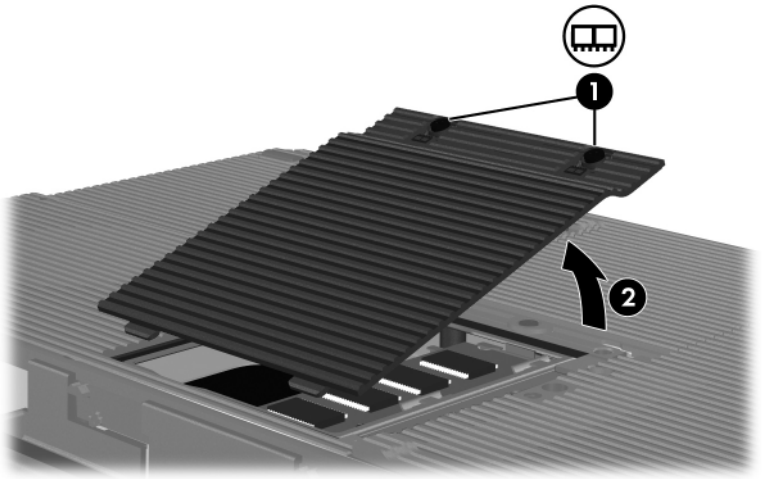
CAUTION: Electrostatic discharge (ESD) can damage electronic components.Before beginning any procedure, be sure that you are discharged of static electricity by touching a grounded metal object. For more information, refer to the *Electrostatic Discharge* guide, which is located in the Help and Support Center.

1. Save your work and close all open applications.
2. Shut down the computer.

   If you are unsure whether the computer is off or in hibernation, turn the computer on, and then shut it down through the operating system.
3. Disconnect all external devices connected to the computer.
4. Disconnect the computer from external power.
5. Remove the battery pack.

   For instructions, refer to the "Inserting or Removing a Battery Pack" section in Chapter 3, "Power."

6. Turn the computer upside down.
7. Loosen the 2 memory compartment screws ❶, and then lift up and remove the memory compartment cover ❷.



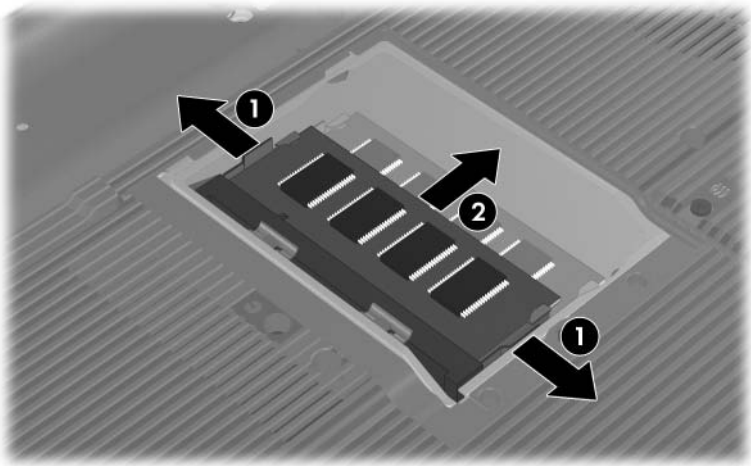
8. Remove or insert the memory module.

   To remove a memory module:

   a. Pull away the retention clips on each side of the module ❶. (The module tilts upward.)

   b. Grasp the edges of the module and gently pull the module out of the memory slot ❷.

   c. To protect a memory module after removal, place it in an electrostatic-safe container.



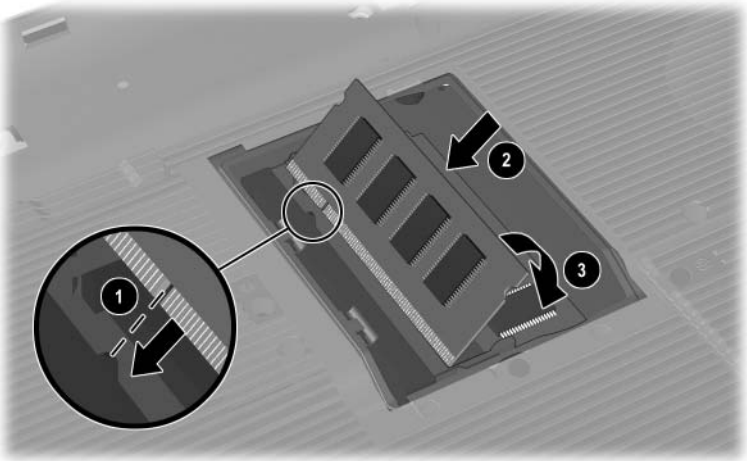
To insert a memory module:

a. Align the keyed (notched) edge of the module with the keyed area in the memory slot ❶.

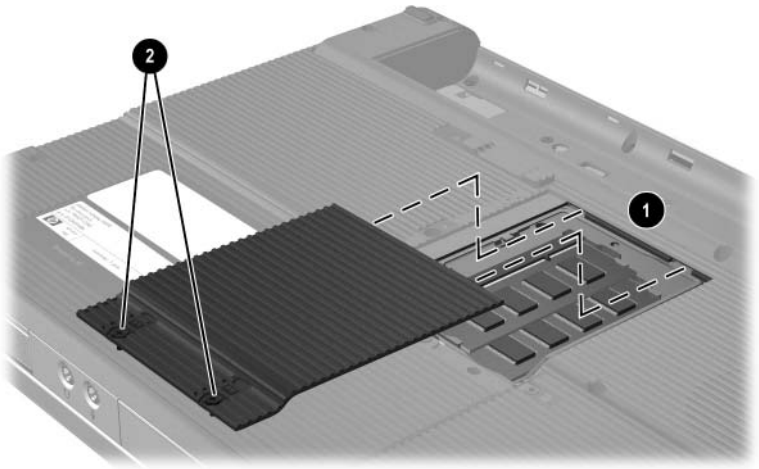
   If you are inserting a single memory module into a vacant memory compartment, insert the module into the lower slot. (The illustration below shows a memory module being inserted into the second slot of a memory compartment that already contains a memory module.)

b. With the module at a 45-degree angle from the surface of the memory compartment, press the module into the memory slot until it is seated ❷.

c. Push the module downward until the retention clips snap into place ❸.



9. To close the memory compartment, align the tabs on the memory compartment cover with the cover slots on the computer, and then press down on the cover until it is seated ❶.
10. Tighten the 2 memory compartment screws ❷.



11. Replace the battery pack, reconnect the computer to external power, and then restart the computer.

8

Software Updates and Recovery and System Software

Software Updates

For optimal computer performance and to be sure your computer remains compatible with changing technologies, install the latest versions of the software provided with your computer as they become available.

As with any other software modification, it is strongly recommended that you set a restore point before beginning a software update. For instructions, refer to "Using System Restore" later in this chapter.

Updated versions of the software provided with the computer may be available through the HP Software Update utility or on the HP Web Site.

CAUTION: If the computer is connected to a network, it is recommended that you consult with your network administrator before installing any software updates, especially ROM updates.

HP Software Update

HP Software Update is a utility included on the computer that automatically checks for software updates from HP. It automatically runs every 30 days and provides a list of software updates and support alerts for the computer.

To run HP Software Update:

» Select **Start > All Programs > HP > HP Software Update**.

Preparing for a Software Update

CAUTION: If your computer connects to a network, consult with your network administrator before installing any software updates, particularly a ROM update.

Accessing Product Information

To access the updates for your computer, you may need the following information:

- The product category is computer.
- The product name, product number (P/N), and serial number (S/N) are provided on the service tag. The information on the service tag is provided in the Help and Support Center and on the service tag label affixed to the bottom of the computer.

Accessing ROM Information

To determine whether an available ROM update is a later ROM version than the ROM version currently installed on the computer, you need to know the version of the currently installed ROM.

To display ROM information from within Windows

» Press the **fn+esc** hotkey. In the **fn+esc** display, the version of the system ROM is displayed as the BIOS (basic input-output system) date. On some computer models, the BIOS date is displayed in decimal format. To clear the display, press **esc**.

ROM information can also be displayed in the Setup Utility. The procedure for displaying ROM information is described in this section. For more information about using the Setup Utility, refer to the "Setup Utility" section later in this chapter.

To display ROM information in the Setup Utility:

1. To open the Setup Utility, turn on or restart the computer in Windows, and then press **f10** while the prompt "Press <F10> to enter setup" is displayed in the lower-left corner of the screen.
2. If the Setup Utility does not open with system information displayed, use the arrow keys to select the **Main** menu. (When the Main menu is selected, ROM and other system information is displayed.)
3. To close the Setup Utility without changing any settings, use the arrow keys to select the **Exit** menu > **Exit Discarding Changes**, and then press **enter**. (The computer restarts in Windows.)

Downloading and Installing an Update

Most software at the http://www.compaq.com/consumersupport Web site (English only) is packaged in compressed files.

Most download packages contain a file named Readme.txt. A Readme.txt file contains detailed descriptive, installation, and troubleshooting information about the download. The Readme.txt files included with ROM updates are in English only.

The following sections provide instructions for downloading and installing

- A ROM update.
- A software update other than a ROM update; for example, an application update.

The computer BIOS is stored on the system ROM. The BIOS initializes the operating system, determines how the computer will interact with the hardware devices, and provides for data transfer among the hardware devices, including the time and date.

Downloading and Installing a ROM Update

CAUTION: To prevent serious damage to the computer or an unsuccessful installation, download and install a ROM update only while the computer is connected to reliable external power using the AC adapter. (Do not download or install a ROM update while the computer is running on battery power, docked in an optional expansion product, or connected to an optional power source.) During the download and installation:

- Do not disconnect power from the computer by unplugging the power cord from the AC outlet.
- Do not shut down the computer or initiate standby or hibernation.
- Do not insert, remove, connect, or disconnect any device, cable, or cord.

Downloading a ROM Update

1. Access the page at the http://www.compaq.com/consumersupport Web site that provides software for your computer.
2. Select a software update link in the Help and Support Center.
3. Follow the instructions on the screen to identify your computer and access the ROM update you want to download.
4. At the download area:
   a. Record the date, name, or other identifier of any ROM update that is later than the ROM currently installed on your computer. (You may need this information to locate the update later, after it has been downloaded to the hard drive.)
   b. Record the path to the default or custom location on the hard drive to which the ROM package will download. (You may need to access the ROM package after it has been downloaded.)
   c. Follow the online instructions to download your selection to the hard drive.

Installing a ROM Update

ROM installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed:

1. Open Windows Explorer. To open Windows Explorer from the **Start** button:

   Select **Start > All Programs > Accessories > Windows Explorer**.

2. In the left pane of the Windows Explorer window, select **My Computer >** your hard drive designation. (The hard drive designation is typically Local Disk C.) Then follow the path you recorded earlier to the folder on your hard drive containing the update.

3. To begin the installation, open the folder, and then double-click the file with an .exe extension—for example, SP123456.exe. (The ROM update installation begins.)

4. To complete the installation, follow the instructions on the screen.

After a message on the screen reports a successful installation, you can delete the downloaded file from the destination folder.

Downloading and Installing a Non-ROM Software Update

To update software other than the ROM:

1. Access the page at the http://www.compaq.com/consumersupport Web site that provides software for your computer.
2. Select a software update link in the Help and Support Center.
3. Follow the instructions on the screen to identify your computer and access the SoftPaq you want to download.
4. At the download area:
   a. Write down the date, name, or other identifier of the SoftPaq you plan to download. (You may need this information to locate the update later, after it has been downloaded to the hard drive.)
   b. Follow the online instructions to download the SoftPaq to the hard drive.
5. When the download is complete, open Windows Explorer. To open Windows Explorer from the Start button:

   Select **Start > All Programs > Accessories > Windows Explorer**.

6. In the left pane of the Windows Explorer window, select **My Computer** > your hard drive designation (which is typically Local Disk C) > **SWSetup**.

   The destination folder for most downloads from the http://www.compaq.com/consumersupport Web site is the SWSetup folder. If you don't see the download in the SWSetup folder, look in the My Documents folder.

7. In the destination folder, select the name or number of the software package you have downloaded.
8. Select the file that includes an .exe extension—for example, SP123456.exe. (The installation begins.)
9. To complete the installation, follow the instructions on the screen.

After a message on the screen reports a successful installation, you can delete the downloaded file from the destination folder.

Software Recovery

Using System Restore

System Restore is an operating system feature that enables you to undo harmful changes to your computer software by restoring your software to an earlier time, called a *restore point,* when your software was functioning optimally.

Restore points are restorable, benchmark "snapshots" of your application, driver, and operating system files. The computer sets restore points at regular intervals and may set additional restore points whenever you change your personal settings or add software or hardware.

Manually setting additional restore points provides additional protection for your system files and settings. It is recommended that you manually set restore points

- Before you add or extensively modify software or hardware.
- Periodically, whenever the system is performing optimally.

Restoring to any restore point does not affect your files. For example, restoring your system software to an earlier time will not affect documents or e-mails that you saved after that time. All System Restore procedures are reversible.

Setting a Restore Point

To set a system restore point manually:

1. Click **System Restore** in the Help and Support Center.
2. Select **Create a restore point**, and then follow the instructions on the screen.

Restoring to a Restore Point

To restore the computer to a restore point:

1. Be sure the computer is connected to reliable external power through the AC adapter.
2. Click **System Restore** in the Help and Support Center.
3. Select **Restore my computer to an earlier time**, and then follow the instructions on the screen.

Setup Utility

The Setup Utility is a ROM-based information and customization utility that can be used even when your operating system is not working or will not load.

The utility reports information about the computer and provides settings for startup, security, and other preferences.

Step-by-step instructions for setting specific preferences are included by topic earlier in this guide. For example, procedures for setting password and other security preferences are provided in Chapter 6, "Security."

Opening the Setup Utility

To open the Setup Utility:

1. Turn on or restart the computer in Windows.
2. Before Windows opens and while the "Press <F10> to enter setup" prompt is displayed in the lower-left corner of the screen, press **f10**.

Changing the Language of the Setup Utility

The following procedure explains how to change the language of the Setup Utility. If the computer is not in the Setup Utility, begin at step 1. If the computer is in the Setup Utility, begin at step 2.

1. To open the Setup Utility, turn on or restart the computer in Windows, and then press **f10** while the prompt "Press <F10> to enter setup" is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **System Configuration > Language**, and then press **enter**.
3. Press **f5** or **f6** (or use the arrow keys) to select a language, and then press **enter**.
4. When a confirmation prompt with your preference selected is displayed, press **enter** to save your preference.
5. To set your preferences and exit the Setup Utility, press **f10**, and then follow the instructions on the screen.

Your preferences go into effect when the computer restarts in Windows.

Navigating and Selecting in the Setup Utility

Because the Setup Utility is not Windows-based, it does not support the TouchPad. Navigation and selection are by keystroke.

- To choose a menu or a menu item, use the arrow keys.
- To choose an item in a drop-down list or to toggle a field, for example an Enable/Disable field, use either the arrow keys or **f5** or **f6**.
- To select an item, press **enter**.
- To close a text box or return to the menu display, press **esc**.

To display additional navigation and selection information while the Setup Utility is open, press **f1**.

Displaying System Information

The following procedure explains how to display system information in the Setup Utility. If the Setup Utility is not open, begin at step 1. If the Setup Utility is open, begin at step 2.

1. To open the Setup Utility, turn on or restart the computer in Windows, and then press **f10** while the prompt "Press <F10> to enter setup" is displayed in the lower-left corner of the screen.
2. Access the system information on the **Main** menu.
3. To close the Setup Utility without changing any settings, use the arrow keys to select the **Exit** menu > **Exit Discarding Changes**, and then press **enter**. (The computer restarts in Windows.)

Restoring Default Settings in the Setup Utility

The following procedure explains how to restore the Setup Utility default settings. If the computer is not in the Setup Utility, begin at step 1. If the computer is in the Setup Utility, begin at step 2.

1. To open the Setup Utility, turn on or restart the computer in Windows, and then press **f10** while the prompt "Press <F10> to enter setup" is displayed in the lower-left corner of the screen.
2. Select **Exit > Load Setup Defaults**, and then press **f10**.
3. When the Setup Confirmation is displayed, press **enter** to save your preferences.
4. To set your preferences and exit the Setup Utility, press **f10**, and then follow the instructions on the screen.

The Setup Utility default settings are set when you exit the Setup Utility and go into effect when the computer restarts.

Your password, security, and language settings are not changed when you restore the factory default settings.

Using Advanced Setup Utility Features

This guide explains the Setup Utility features recommended for all users. Additional features, recommended for advanced users only, are explained in the Help and Support Center.

Two messages related to these advanced features may be displayed in the lower-left corner of the screen each time the computer is started or restarted in Windows, or is restored from hibernation:

- <F12> to boot from LAN.

  ✎ The "<F12> to boot from LAN" message is not displayed if the Internal Network Adapter boot option is disabled in the Setup Utility.

- Press <ESC> to change boot order.

Closing the Setup Utility

You can close the Setup Utility with or without saving changes.

- To close the Setup Utility and save your changes from the current session, use either of the following procedures:
  - ❑ Press **f10**, and then follow the instructions on the screen.

  – or –

  - ❑ If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use arrow keys to select the **Exit** menu **> Exit Saving Changes**, and then press **enter**.

  When you use the **f10** procedure, you are offered an option to return to the Setup Utility. When you use the Exit Saving Changes procedure, the Setup Utility closes when you press **enter**.
- To close the Setup Utility without saving your changes from the current session:

  If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use arrow keys to select the **Exit** menu **> Exit Discarding Changes**, and then press **enter**.

After the Setup Utility closes, the computer restarts in Windows.

Setup Utility Menus

Main Menu

View	
System information	■ View and change the system time and date. ■ View identification information about the computer. ■ View specification information about the processor, memory size, system BIOS, and keyboard controller version (select models only).

Security Menu

Select	To Do This
Administrator Password	Enter, change, or delete an administrator password.
Power-On Password	Enter, change, or delete a power-on password.

System Configuration Menu

Select	To Do This
Language	Change the Setup Utility language.
Embedded Wireless LAN Device Radio	Enable/disable the embedded wireless LAN device.
Embedded Bluetooth device (select models only)	Enable/disable the embedded Bluetooth device (select models only).
Enhanced SATA support	Enable/disable enhanced SATA support.
Boot Options	Set the following boot options:
■ **f10** and **f12** Delay (sec.)	Set the delay for the f**10** and **f12** functions of the Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20).
■ CD-ROM boot	Enable/disable boot from CD-ROM.
■ Floppy boot	Enable/disable boot from Floppy.
■ Internal Network Adapter boot	Enable/disable boot from Internal Network Adapter.
■ Boot Order	Set the boot order for: ■ USB Floppy ■ ATAPI CD/DVD ROM Drive ■ Hard drive ■ USB Diskette on Key ■ USB Hard drive ■ Network adapter

Diagnostics Menu

Select	To Do This
Hard Disk Self Test	Run a comprehensive self-test on the hard drive.

A

Specifications

Operating Environment

The operating environment information in the following table may be helpful if you plan to use or transport the computer in extreme environments.

Factor	Metric	U.S.
Temperature		
Operating	10°C to 35°C	50°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	10% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft

Rated Input Power

The power information in this section may be helpful if you plan to travel internationally with the computer.

The computer operates on DC power, which can be supplied by an AC or a DC power source. Although the computer can be powered from a stand-alone DC power source, it is strongly recommended that the computer be powered only with an AC adapter or DC power cord supplied with or approved for a Compaq computer.

The computer is capable of accepting DC power within the following specifications.

Input Power	Rating
Operating voltage	18.5 V DC to 19V@ 3.5A - 65 W
Operating current	3.5 A, 4.74, or 4.9A

This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 230V.

Expansion Port Input/Output Signals

The expansion port signal information in this section may be helpful if you plan to use an optional expansion product that connects to the expansion port 2 on select computer models (The term *expansion port 2* describes the type of expansion port).

The expansion port is illustrated in the "Left-Side Components" section of Chapter 1, "Hardware."

Optional expansion products that connect to the computer through the expansion port may include an expansion product or a media cable.

The following table identifies the input and output signals supported by the expansion port on your computer.

Feature	Support
USB 2.0	Yes
10/100 Ethernet	Yes
Gigabit Ethernet	No
IEEE 1394 (4-pin port)	No
Infrared Lens (for optional remote control only)	Yes
Power inputs	90-135W maximum
Composite TV	Yes
S-Video TV	Yes
Component TV	No
S/PDIF audio	Yes
DVI	No
Headphone/speaker audio-out	Yes
Microphone audio-in	Yes

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