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Product notice

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Safety warning notice

⚠ WARNING! To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

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1 Welcome

After you set up and register the computer, it is important to take the following steps:

- **Connect to the Internet**—Set up your wired or wireless network so that you can connect to the Internet. For more information, refer to Networking on page 17.
- Update your antivirus software—Protect your computer from damage caused by viruses. The
 software is preinstalled on the computer and includes a limited subscription for free updates. For
 more information, refer to the HP Notebook Reference Guide. For instructions on accessing this
 guide, refer to Finding information on page 5.
- **Get to know your computer**—Learn about your computer features. Refer to <u>Getting to know your computer on page 7</u> and <u>Keyboard and pointing devices on page 21</u> for additional information.
- **Create recovery discs**—Recover the operating system and software to factory settings in case of system instability or failure. For instructions, refer to <u>Backup and recovery on page 41</u>.
- Find installed software—Access a list of the software preinstalled on the computer. Select
 Start > All Programs. For details about using the software included with the computer, refer to
 the software manufacturer's instructions, which may be provided with the software or on the
 manufacturer's Web site.

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What's new?

Using Stardock software

Stardock software includes the following features:

- Stardock MyColors—Offers a customizable desktop theme that transforms the look and feel of your basic Windows desktop. The new desktop includes custom icons, visual styles (Start button and taskbar), and 3 corresponding wallpapers. To change back to the standard Windows theme, open the Stardock MyColors program and select the standard Windows theme.
- Stardock Fences—Organizes the icons on your desktop. When the custom theme has been applied, all of the icons on the desktop are moved to a vertical column or "fence" in the lower left corner of the screen, with the Recycle Bin at the top. To customize Fences or to access the software Help, select Start > All Programs > Stardock. Click Fences, and then click Fences.Ink.

Using ATI Eyefinity Multi-Display technology

Your computer supports the new ATI Eyefinity™ technology, which provides the following features:

- Allows you to use up to 2 external displays, as long as one of the displays is connected to the Mini DisplayPort on the computer
- Provides a new display configuration by spanning the image across a group of external displays into a single large surface (SLS)

Example display configuration for single large surface (SLS)

You can use 2 external displays and span the image across them as an SLS. The 2 external displays are connected to the computer using the Mini DisplayPort and the HDMI port.

NOTE: Identical resolution is required between external displays to form an SLS. Displays with different native resolutions can still form an SLS by using non-native resolutions.





Switching the screen image

Press the switch screen image action key to open a dialog box that shows the 4 configuration choices, independent of the number of connected display devices.

- Disconnect Projector mode—Turns off the external display and displays the image only on the computer display.
- Duplicate mode—Clones the computer display onto an external display that is connected to the HDMI port or the Mini DisplayPort on the computer.

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- Extend mode—Extends the desktop to all connected external displays along with the computer display.
- Projector only mode—Turns off the computer display and sets all connected external displays to extended desktop.
- NOTE: You can manage the video output and default output devices using the ATI Catalyst Control Center. Refer to Using the ATI Catalyst Control Center on page 3 for information.

Using the ATI Catalyst Control Center

To configure desktops and displays and to manage ATI Eyefinity, you must use the ATI Catalyst™ Control Center.

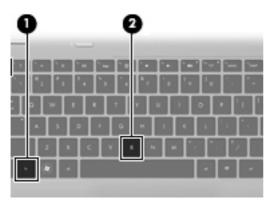
To open the ATI Catalyst Control Center:

- Select Start > All Programs > Catalyst Control Center.
- 2. Click the **Graphics** arrow, and then select **Desktops and Displays**.
- NOTE: For additional information on using the ATI Catalyst Control Center, refer to the software Help.

Beats Audio

Beats Audio is an enhanced audio profile that provides a deep, controlled bass while maintaining a clear sound. Beats Audio is enabled by default.

To increase or decrease the Beats Audio bass settings, press fn (1) and the letter b (2).



NOTE: You can also view and control the bass settings through the Windows operating system. Select Start, > Control Panel > Hardware and Sound > HP Beats Audio Control Panel > Equalization to view and control the bass properties.

The following table shows and describes the Beats Audio icons.

Item Description

ENWW Beats Audio

3



Indicates that Beats Audio is enabled.



Indicates that Beats Audio is disabled.

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Finding information

The computer comes with several resources to help you perform various tasks.

Resources	For information about
Quick Setup poster	How to set up the computer
	Help to identify computer components
HP Notebook Reference Guide	Power management features
To access this guide, select Start > Help and Support > User	How to maximize battery life
Guides.	 How to use the multimedia features of the computer
	How to protect the computer
	How to care for the computer
	How to update the software
Help and Support	Operating system information
To access Help and Support, select Start > Help and Support .	Software, driver, and BIOS updates
NOTE: For country- or region-specific support, go to	Troubleshooting tools
http://www.hp.com/support, select your country or region, and follow the on-screen instructions.	How to access technical support
Regulatory, Safety, and Environmental Notices	Regulatory and safety information
To access the notices, select Start > Help and Support > User Guides .	Battery disposal information
Safety & Comfort Guide	Proper workstation setup, posture, health, and work habits
To access this guide:	
Select Start > Help and Support > User Guides.	Electrical and mechanical safety information
- or -	
Go to http://www.hp.com/ergo.	
Worldwide Telephone Numbers booklet	HP support telephone numbers
This booklet is provided with your computer.	
HP Web site	Support information
To access this Web site, go to http://www.hp.com/support .	Ordering parts and finding additional help
	Software, driver, and BIOS (Setup Utility) updates
	Accessories available for the device

ENWW Finding information

Resources	For information about		
Limited Warranty*	Warranty information		
To access the warranty:			
Select Start > Help and Support > HP Warranty.			
– or –			
Go to http://www.hp.com/go/orderdocuments .			

*You can find the expressly provided HP Limited Warranty applicable to your product located with the electronic guides on your computer and/or on the CD/DVD provided in the box. Some countries/regions may provide a printed HP Limited Warranty in the box. In countries/regions where the warranty is not provided in printed format, you may request a printed copy at http://www.hp.com/go/orderdocuments or write to:

- North America: Hewlett Packard, MS POD, 11311 Chinden Blvd, Boise, ID 83714, USA
- Europe, Middle East, Africa: Hewlett Packard, POD, Via G. Di Vittorio, 9, 20063, Cernusco s/Naviglio (MI), Italy
- Asia Pacific: Hewlett Packard, POD, P.O. Box 200, Alexandra Post Office, Singapore 911507.

Please include your product name, warranty period (found on your serial number label), name and postal address.

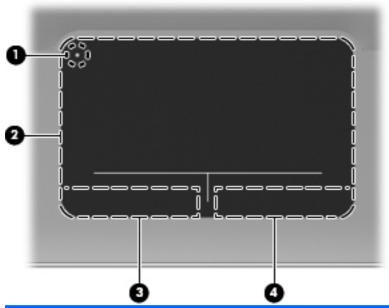
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2 Getting to know your computer

Top

TouchPad



Com	oonent		Description
(1)	•	TouchPad light	Turns the TouchPad on and off. Quickly double-tap the TouchPad light to turn the TouchPad on and off.
(2)		TouchPad zone	Moves the pointer and selects or activates items on the screen.
(3)		Left TouchPad button	Functions like the left button on an external mouse.
(4)		Right TouchPad button	Functions like the right button on an external mouse.

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Lights



Com	Component Description		scription	
(1)	•	TouchPad light	•	Amber: The TouchPad is off.
	•		•	Off: The TouchPad is on.
(2)	(l)	Power light	•	White: The computer is on.
	\circ		•	Blinking white: The computer is in the Sleep state.
			•	Off: The computer is off or in Hibernation.
(3)	10	Mute light	•	Amber: Computer sound is off.
	•		•	Off: Computer sound is on.
(4)	((I))	Wireless light	•	White: An integrated wireless device, such as a wireless local area network (WLAN) device, is on.
				NOTE: Wireless devices are enabled at the factory.
			•	Amber: All wireless devices are off.

Button



Component

Description



Power button

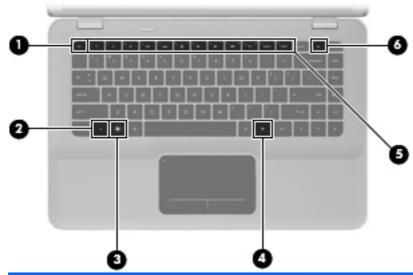
- When the computer is off, press the button to turn on the computer.
- When the computer is on, press the button briefly to initiate Sleep.
- When the computer is in the Sleep state, press the button briefly to exit Sleep.
- When the computer is in Hibernation, press the button briefly to exit Hibernation.

If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.

To learn more about your power settings, select **Start > Control Panel > System and Security > Power Options**, or refer to the *HP Notebook Reference Guide*.

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Keys



Com	ponent		Description
(1)		esc key	Displays system information when pressed in combination with the fn key.
(2)		fn key	Executes frequently used system functions when pressed in combination with the b key or the esc key.
(3)	•	Windows logo key	Displays the Windows Start menu.
(4)		Windows applications key	Displays a shortcut menu for items beneath the pointer.
(5)		Action keys	Execute frequently used system functions.
(6)	_	Optical drive eject key	Opens the optical drive.

Front



		• •
Component		Description
(1)	Speakers (2)	Produce sound.
(2)	Bluetooth compartment	Contains a Bluetooth® device.
(3)	Digital Media Slot	Supports the following digital card formats:
		MultiMediaCard
		Secure Digital (SD) Memory Card
		Secure Digital High Capacity Memory Card
		Secure Digital Extended Capacity Memory Card

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Right side



Com	oonent		Description
(1)	d١	Power light	White: The computer is on.
	0		Blinking white: The computer is in the Sleep state.
			Off: The computer is off or in Hibernation.
(2)	8	Drive light	Blinking white: The hard drive is being accessed.
			 Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the hard drive.
			NOTE: For information on HP ProtectSmart Hard Drive Protection, refer to the <i>HP Notebook Reference Guide</i> .
(3)	eSATA •€÷	eSATA/USB port	Connects a high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device.
(4)	HDMI	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(5)	ΪĐ	Mini DisplayPort	Connects an optional digital display device, such as a high-performance monitor or projector.
(6)	ß	Security cable slot	Attaches an optional security cable to the computer.
	K		NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(7)	***	RJ-45 (network) jack	Connects a network cable.
(8)		Vent	Enables airflow to cool internal components.
			NOTE: 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.

Component Description		Description	
(9)		Battery light	 Off: The computer is running on battery power. Blinking amber: The battery has reached a low
			battery level, a critical battery level, or there is a battery error.
			 Amber: A battery is charging.
			 White: The computer is connected to external power and the battery is fully charged.
(10)	Ą	Power connector	Connects an AC adapter.

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Left side



Component		Description	
(1)	Optical drive	Reads and writes to an optical disc. CAUTION: Do not insert 8-cm optical discs into the optical drive. This can cause damage to the computer.	
(2)	USB ports (2)	Connect optional USB devices.	
(3)	Audio-out (headphone) jack/Audio-in (microphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, earbuds, a headset, or television audio. Also connects an optional headset microphone. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the Regulatory, Safety, and Environmental Notices. NOTE: When a device is connected to the jack, the computer speakers are disabled. NOTE: Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).	
(4)	Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the Regulatory, Safety, and Environmental Notices. NOTE: When a device is connected to the jack, the computer speakers are disabled.	

Display

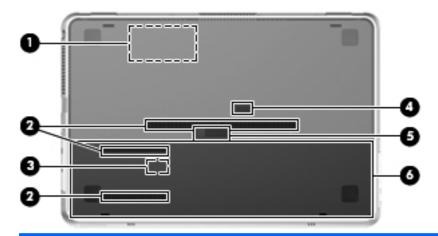


Component		Description	
(1)	WWAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).	
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).	
(3)	Internal microphones (2)	Record sound.	
(4)	Webcam	Records video and captures still photographs.	
		To access the webcam, select Start > All Programs > HP > HP MediaSmart > HP MediaSmart Webcam .	
(5)	Webcam light	On: The webcam is in use.	
(5)	Webcam light	On: The webcam is in use.	

^{*}The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. To see wireless regulatory notices, refer to the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. These notices are located in Help and Support.

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Bottom



Component			Description
(1)	B	Memory module compartment	Contains the memory module slot.
(2)		Vents (3)	Enable airflow to cool internal components.
			NOTE: 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.
(3)		SIM slot (select models only)	Contains a wireless subscriber identity module (SIM). The SIM slot is located inside the battery bay.
(4)		Accessory battery connector	Connects an optional accessory battery.
(5)		Battery cover release latch	Releases the battery cover.
(6)		Battery bay	Holds the battery and the hard drive.
			NOTE: The battery is preinstalled in the battery bay at the factory.

3 Networking

NOTE: Internet hardware and software features vary depending on computer model and your location.

Your computer supports two types of Internet access:

- Wireless—For mobile Internet access, you can use a wireless connection. Refer to <u>Connecting</u> to an existing WLAN on page 18 or <u>Setting up a new WLAN network on page 19</u>.
- Wired—You can access the Internet by connecting to a wired network. For information on connecting to a wired network, refer to the HP Notebook Reference Guide.

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Using an Internet service provider (ISP)

Before you can connect to the Internet, you must establish an ISP account. Contact a local ISP to purchase Internet service and a modem. The ISP will help set up the modem, install a network cable to connect your wireless computer to the modem, and test the Internet service.

NOTE: Your ISP will give you a user ID and password to access the Internet. Record this information and store it in a safe place.

The following features will help you set up a new Internet account or configure the computer to use an existing account:

- Internet Services & Offers (available in some locations)—This utility assists with signing up
 for a new Internet account and configuring the computer to use an existing account. To access
 this utility, select Start > All Programs > Online Services > Get Online.
- **ISP-provided icons (available in some locations)**—These icons may be displayed either individually on the Windows desktop or grouped in a desktop folder named Online Services. To set up a new Internet account or configure the computer to use an existing account, double-click an icon, and then follow the on-screen instructions.
- **Windows Connect to the Internet Wizard**—You can use the Windows Connect to the Internet Wizard to connect to the Internet in any of these situations:
 - You already have an account with an ISP.
 - You do not have an Internet account and want to select an ISP from the list provided within the wizard. (The list of ISP providers is not available in all regions.)
 - You have selected an unlisted ISP, and the ISP has provided you with information such as a specific IP address and POP3 and SMTP settings.

To access the Windows Connect to the Internet Wizard and instructions for using it, select **Start** > **Help and Support**, and then type Connect to the Internet wizard in the Search box.

NOTE: If you are prompted within the wizard to choose between enabling or disabling Windows Firewall, choose to enable the firewall.

Connecting to a wireless network

Wireless technology transfers data across radio waves instead of wires. Your computer may be equipped with one or more of the following wireless devices:

- Wireless local area network (WLAN) device
- HP Mobile Broadband Module, a wireless wide area network (WWAN) device
- Bluetooth device

For more information on wireless technology and connecting to a wireless network, refer to the *HP Notebook Reference Guide* and information and Web site links provided in Help and Support.

Connecting to an existing WLAN

- 1. Turn on the computer.
- 2. Be sure that the WLAN device is on.

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- 3. Click the network icon in the notification area, at the far right of the taskbar.
- 4. Select a network to connect to.
- 5. Click Connect.
- 6. If required, enter the security key.

Setting up a new WLAN network

Required equipment:

- A broadband modem (either DSL or cable) (1) and high-speed Internet service purchased from an Internet service provider (ISP)
- A wireless router (purchased separately) (2)
- Your new wireless computer (3)
- NOTE: Some modems have a built-in wireless router. Check with your ISP to determine what type of modem you have.

The illustration shows an example of a completed WLAN 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.



Configuring a wireless router

For help in setting up a WLAN, refer to the information provided by your router manufacturer or your ISP.

The Windows operating system also provides tools to help you set up a new wireless network. To use the Windows tools to set up your network, select **Start > Control Panel > Network and Internet > Network and Sharing Center > Set up a new connection or network > Set up a new network.** Then follow the on-screen instructions.

NOTE: It is recommended that you initially connect your new wireless computer to the router by using the network cable provided with the router. When the computer successfully connects to the Internet, you can disconnect the cable, and then access the Internet through your wireless network.

Protecting your WLAN

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When you set up a WLAN or access an existing WLAN, always turn on security features to protect your network from unauthorized access.

For information on protecting your WLAN, refer to the HP Notebook Reference Guide.

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4 Keyboard and pointing devices

Using the keyboard

Using the action keys

Action keys are customized actions that are assigned to specific keys at the top of the keyboard.

To use an action key, press and hold this key to activate the assigned action.

NOTE: Depending on the program you are using, pressing fn and one of the action keys opens a specific shortcut menu within that application.

NOTE: You can disable the action key feature in Setup Utility (BIOS) and revert back to pressing the fn key and one of the action keys to activate the assigned action.



lcon	Action	Description
2	Help and Support	Opens Help and Support.
٠		Help and Support provides tutorials, answers to questions, and product updates.
*	Screen brightness down	Decreases the screen brightness level.
*	Screen brightness up	Increases the screen brightness level.

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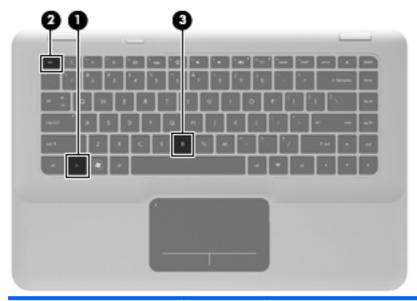
lcon	Action	Description	
	Switch screen image	Switches the screen image among display devices connected to the system. For example, if a monitor is connected to the computer, this key alternates the screen image from computer display to monitor display to simultaneous display on both the computer and the monitor.	
		Most external monitors receive video information from the computer using the external VGA video standard. The switch screen image key can also alternate images among other devices that are receiving video information from the computer.	
		The computer supports multiple display outputs. When you press the switch screen image key, you can select from four different video outputs:	
		Disconnect Projector mode	
		Duplicate mode	
		Extend mode	
		Projector only mode	
٧	Keyboard backlight	Turns the keyboard backlight on and off.	
		NOTE: The keyboard backlight is turned on at the factory. To extend battery life, turn off the keyboard backlight.	
(A)	Web	Opens a Web browser.	
•		NOTE: Until you set up your Internet or network services, this key opens the Internet Connection Wizard.	
4 −	Volume down	Decreases speaker volume.	
4 +	Volume up	Increases speaker volume.	
4 ◎	Mute	Mutes or restores speaker sound.	
((T))	Wireless	Turns the wireless feature on or off.	
τ,		NOTE: This key does not establish a wireless connection. To establish a wireless connection, a wireless network must be set up.	
prt sc	Print screen	Takes a snapshot or picture of your computer screen and copies it to the clipboard.	

Using the hotkeys

A hotkey is a combination of the fn key (1) and either the esc key (2) or the b key (3).

To use a hotkey:

▲ Briefly press the fn key, and then briefly press the second key of the hotkey combination.



Function	Hotkey	Description
Display system information.	fn+esc	Displays information about system hardware components and the system BIOS version number.
Control the bass settings.	fn+b	Increases or decreases the Beats Audio bass settings.
		Beats Audio is an enhanced audio profile that provides a deep, controlled bass while maintaining a clear sound. Beats Audio is enabled by default.
		You can also view and control the bass settings through the Windows operating system. Select Start > Control Panel > Hardware and Sound > HP Beats Audio Control Panel > Equalization to view and control the bass properties.

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Using pointing devices

NOTE: In addition to the pointing devices included with your computer, you can use an external USB mouse (purchased separately) by connecting it to one of the USB ports on the computer.

Setting pointing device preferences

Use Mouse Properties in Windows® to customize settings for pointing devices, such as button configuration, click speed, and pointer options.

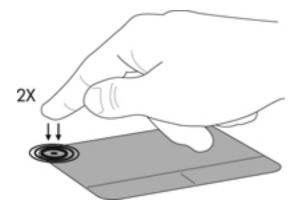
To access Mouse Properties, select **Start > Devices and Printers**. Then, right-click the device representing your computer, and select **Mouse settings**.

Using the TouchPad

To move the pointer, slide one finger across the TouchPad in the direction you want the pointer to go. Use the left and right TouchPad buttons like the corresponding buttons on an external mouse.

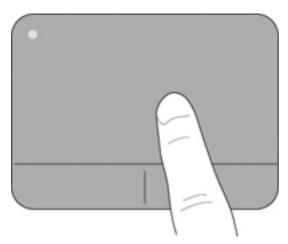
Turning the TouchPad on and off

To turn the TouchPad on and off, quickly double-tap the TouchPad light. If the TouchPad light is amber, the TouchPad is off.



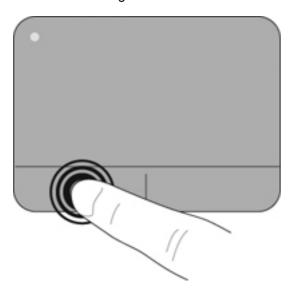
Navigating

To move the pointer, slide one finger across the TouchPad in the direction you want the pointer to go.



Selecting

Use the left and right TouchPad buttons like the corresponding buttons on an external mouse.



Using TouchPad gestures

The TouchPad supports a variety of gestures. To use TouchPad gestures, place two fingers on the TouchPad at the same time.

To turn the gestures on and off:

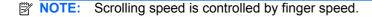
- 1. Double-click the **Synaptics** icon in the notification area, at the far right of the taskbar, and then click the **Device Settings** tab.
- 2. Select the device, and then click **Settings**.
- 3. Select the gesture that you want to turn on or off.
- 4. Click Apply, and then click OK.
- NOTE: The computer also supports additional TouchPad features. To view and turn on these features, double-click the **Synaptics** icon in the notification area, at the far right of the taskbar, and then click the **Device Settings** tab. Select the device, and then click **Settings**.

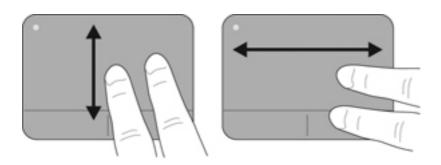
ENWW Using pointing devices

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Scrolling

Scrolling is useful for moving up, down, or sideways on a page or image. To scroll, place two fingers slightly apart on the TouchPad, and then drag them across the TouchPad in an up, down, left, or right motion.

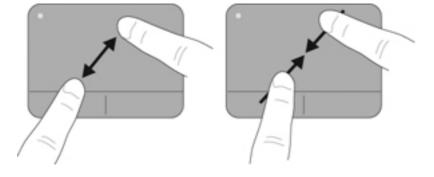




Pinching/Zooming

Pinching allows you to zoom in or out on images or text.

- Zoom in by placing two fingers together on the TouchPad, and then moving them apart.
- Zoom out by placing two fingers apart on the TouchPad, and then moving them together.



5 Maintenance

Removing or inserting the battery

NOTE: The battery is preinstalled in the battery bay at the factory.

NOTE: For additional information on using the battery, refer to the *HP Notebook Reference Guide*.

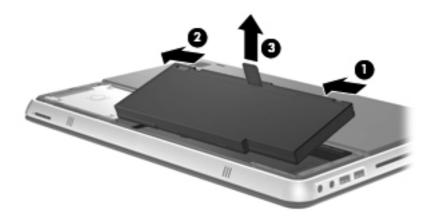
Removing the battery

- △ CAUTION: Removing a battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work and initiate Hibernation or shut down the computer through Windows before removing the battery.
 - 1. Slide the battery cover release latch (1).
 - Slide the battery cover (2) away from the computer, and then remove the battery cover.



- 3. Slide the right battery release latch (1) to unlock the battery.
- 4. Slide the left battery release latch (2) to release the battery.

5. Pull the battery tab up (3) and remove the battery from the computer.

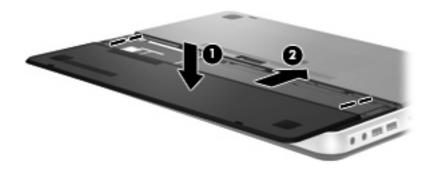


Inserting the battery

- 1. Align the tabs on the battery with the notches on the outer edge of the battery bay (1), and rotate the battery (2) into the battery bay until it is seated.
- 2. Slide the right battery release latch (3) to lock the battery into place.
- NOTE: The left battery release latch automatically locks into place.



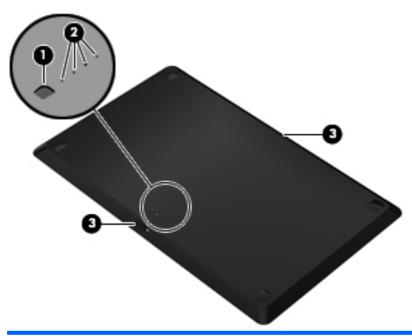
- 3. Replace the battery cover (1).
- 4. Slide the battery cover (2) to the rear until it is seated.
- NOTE: The battery cover release latch automatically locks into place.



Using the accessory battery (select models only)

An accessory battery can extend the battery life of your computer.

Identifying the accessory battery components



Component		Description		
(1)	Battery fuel gauge		When pressed, the battery fuel gauge checks the amount of available battery charge.	
(2)	Battery charge lights (4)	Show the percentage of available battery power.		
		•	Blinking: The accessory battery has reached a low battery level.	
		•	One light on: The accessory battery has 25 percent remaining battery charge.	
		•	Two lights on: The accessory battery has 50 percent remaining battery charge.	
		•	Three lights on: The accessory battery has 75 percent remaining battery charge.	
		•	Four lights on: The accessory battery is fully charged.	
(3)	Battery release latches (2)	Release the battery from the bottom of the computer.		

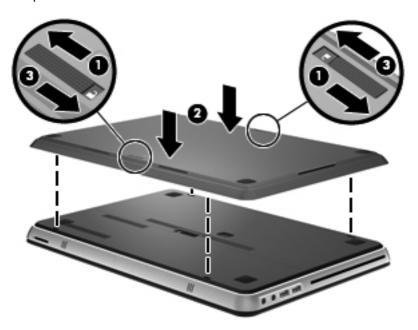
Inserting or removing an accessory battery

To insert the accessory battery:

NOTE: When you install the accessory battery for the first time, be sure to remove the protective cover on the accessory battery connector.

NOTE: It is not necessary to turn off the computer before inserting or removing the accessory battery.

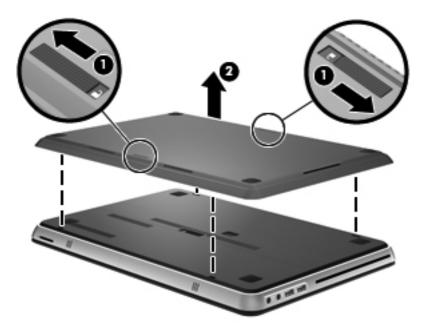
- 1. Turn the computer upside down, with the battery bay toward you.
- 2. Slide the battery release latches (1) on the accessory battery to unlock the battery.
- 3. Align the accessory battery with the bottom of the computer, with the battery fuel gauge toward you.
- 4. Press the accessory battery down (2) until it is seated.
- NOTE: Press down on the center of the accessory battery to be sure that the battery is connected securely to the bottom of the computer.
- 5. Slide the battery release latches (3) on the accessory battery to lock it into place on the computer.



To remove the accessory battery:

1. Slide the battery release latches (1) on the accessory battery to unlock it.

2. Lift the accessory battery (2) from the bottom of the computer.



Battery charging and discharging sequence

The battery charging and discharging sequence varies when both the primary battery and optional accessory battery are installed.

- The computer supports Fast Charge Mode (enabled at the factory). When both batteries are charging, the primary battery will charge to 90 percent before the accessory battery begins charging. Charging is then switched to the accessory battery. When the accessory battery reaches 90 percent, the primary battery will then charge to 100 percent. After the primary battery is completely charged, the accessory battery will charge to 100 percent.
- When the accessory battery reaches a critical battery level, battery power is transferred to the primary battery.
- The accessory battery will discharge before the primary battery discharges.
- When the accessory battery is removed from the computer, battery power is transferred to the primary battery.
- When the accessory battery is inserted in the computer, battery power is transferred to the accessory battery.

Replacing or upgrading the hard drive

NOTE: The hard drive is located inside the battery bay.

△ **CAUTION**: To prevent information loss or an unresponsive system:

Shut down the computer before removing the hard drive from the hard drive bay. Do not remove the hard drive while the computer is on, in the Sleep state, or in Hibernation.

If you are not sure whether the computer is off or in Hibernation, turn the computer on by pressing the power button. Then shut down the computer through the operating system.

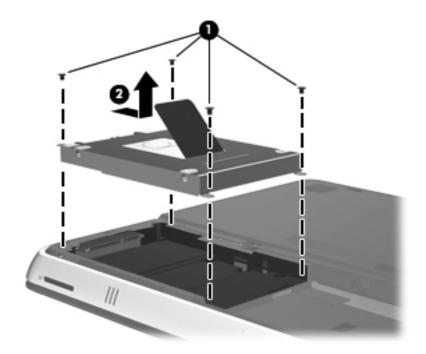
Removing the hard drive

- 1. Save your work and shut down the computer.
- Disconnect all external devices connected to the computer.
- 3. Unplug the power cord from the AC outlet.
- 4. Slide the battery cover release latch (1).
- 5. Slide the battery cover (2) away from the computer, and then remove the battery cover.



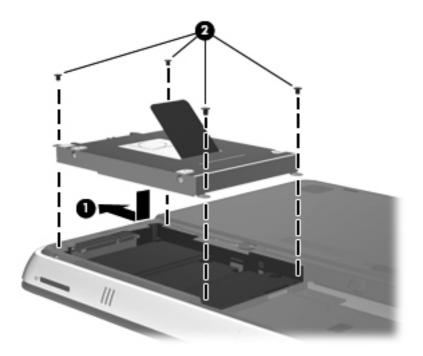
- **6.** Remove the battery.
- NOTE: For instructions on removing the battery, refer to Removing the battery on page 27.
- 7. Remove the hard drive screws (1).

Slide the hard drive (2) to the right and lift it out of the hard drive bay.



Installing a hard drive

- 1. Insert the hard drive (1) into the hard drive bay, and then slide the hard drive to the left until it snaps into place.
- 2. Replace the hard drive screws (2).



- 3. Replace the battery.
- NOTE: For instructions on replacing the battery, refer to <u>Inserting the battery on page 28</u>.
- 4. Replace the battery cover (1).
- 5. Slide the battery cover (2) to the rear until it is seated.
 - NOTE: The battery cover release latch automatically locks into place.



- 6. Reconnect external power and external devices.
- 7. Turn on the computer.

Adding or replacing memory modules

The computer has one memory module compartment. The capacity of the computer can be upgraded by replacing the existing memory module in the primary memory module slot.

- ▲ WARNING! To reduce the risk of electric shock and damage to the equipment, unplug the power cord and remove all batteries before installing a memory module.
- △ CAUTION: Electrostatic discharge (ESD) can damage electronic components. Before beginning any procedure, ensure that you are discharged of static electricity by touching a grounded metal object.

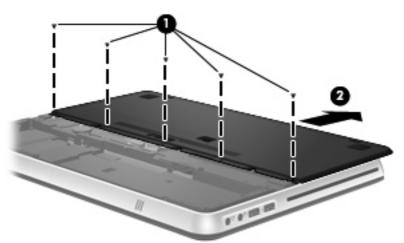
To add or replace a memory module:

△ CAUTION: To prevent information loss or an unresponsive system:

Shut down the computer before adding or replacing memory modules. Do not remove a memory module while the computer is on, in the Sleep state, or in Hibernation.

If you are not sure whether the computer is off or in Hibernation, turn the computer on by pressing the power button. Then shut down the computer through the operating system.

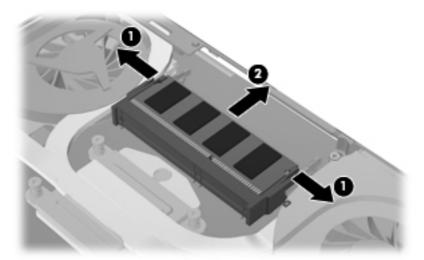
- 1. Save your work and shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- Unplug the power cord from the AC outlet.
- 4. Remove the battery cover and battery.
 - NOTE: For instructions on removing the battery, refer to Removing the battery on page 27.
- 5. Remove the 5 memory module compartment cover screws (1).
- 6. Slide the memory module compartment cover (2) to the rear, and then remove the memory module compartment cover.



- 7. If you are replacing a memory module, remove the existing memory module:
 - **a.** Pull away the retention clips (1) on each side of the memory module.

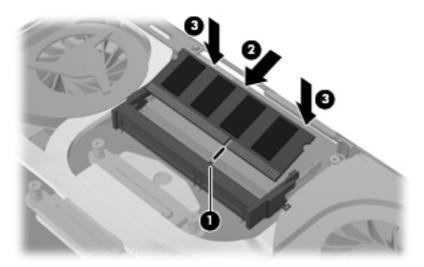
The memory module tilts up.

- **b.** Grasp the edge of the memory module **(2)**, and then gently pull the memory module out of the memory module slot.
 - △ CAUTION: To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.

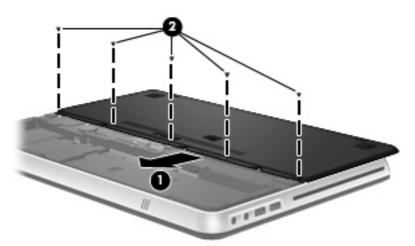


To protect a memory module after removal, place it in an electrostatic-safe container.

- 8. Insert a new memory module:
 - △ CAUTION: To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.
 - a. Align the notched edge (1) of the memory module with the tab in the memory module slot.
 - **b.** With the memory module at a 45-degree angle from the surface of the memory module compartment, press the module (2) into the memory module slot until it is seated.
 - **c.** Gently press the memory module **(3)** down, applying pressure to both the left and right edges of the memory module, until the retention clips snap into place.
 - △ CAUTION: To prevent damage to the memory module, be sure that you do not bend the memory module.



- 9. Replace the memory module compartment cover (1) and then slide the cover to the front until it is seated.
- 10. Replace the 5 memory module compartment cover screws (2).



- **11.** Replace the battery and battery cover.
- NOTE: For instructions on replacing the battery, refer to <u>Inserting the battery on page 28</u>.
- 12. Reconnect external power and external devices.
- **13.** Turn on the computer.

Connecting an external monitor or projector

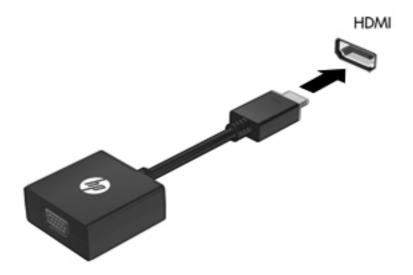
To connect an external display such as a monitor or projector to the computer, connect the HP HDMI to VGA Display Adapter (select models only) to the HDMI port on the computer.

The HP HDMI to VGA Display Adapter supports the following resolution types:

- 800 × 600
- 1024 × 768
- 1280 × 720
- 1280 × 800
- 1280 × 1024
- 1400 × 1050
- 1440 × 900
- 1600 × 1200
- 1680 × 1050
- 1920 × 1080

To connect an external monitor or projector using the HDMI to VGA Display Adapter, follow these steps:

1. Connect the HDMI to VGA Display Adapter to the HDMI port on the computer.



- 2. Connect an external monitor or projector to the other end of the adapter.
- NOTE: If a properly connected external display device does not display an image, press the switch screen image key to transfer the image to the device. Repeatedly pressing the switch screen image key alternates the screen image between the computer display and the device.

Updating programs and drivers

HP recommends that you update your programs and drivers on a regular basis. Go to http://www.hp.com/support to download the latest versions. You can also register to receive automatic update notifications when they become available.

Routine care

Cleaning the display

△ CAUTION: To prevent permanent damage to the computer, never spray water, cleaning fluids, or chemicals on the display.

To remove smudges and lint, frequently clean the display with a soft damp, lint-free cloth. If the screen requires additional cleaning, use premoistened antistatic wipes or an antistatic screen cleaner.

Cleaning the TouchPad and keyboard

Dirt and grease on the TouchPad can cause the pointer to jump around on the screen. To avoid this, clean the TouchPad with a damp cloth, and wash your hands frequently when using the computer.

▲ WARNING! To reduce the risk of electric shock or damage to internal components, do not use a vacuum cleaner attachment to clean the keyboard. A vacuum cleaner can deposit household debris on the keyboard surface.

Clean the keyboard regularly to prevent keys from sticking, and to remove dust, lint, and particles that can become trapped beneath the keys. A can of compressed air with a straw extension can be used to blow air around and under the keys to loosen and remove debris.

Chapter 5 Maintenance

6 Backup and recovery

Recovery after a system failure is as good as your most recent backup. HP recommends that you create recovery discs immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

Tools provided by the operating system and HP Recovery Manager software are designed to help you with the following tasks for safeguarding your information and restoring it in case of a computer failure:

- Creating a set of recovery discs (Recovery Manager software feature)
- Backing up your information
- Creating system restore points
- Recovering a program or driver
- Performing a full system recovery (from the partition or recovery discs)

NOTE: Recovery discs have been included if your computer does not have a partition. Use these discs to recover your operating system and software. To check for the presence of a recovery partition, click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**. If the partition is present, an HP Recovery drive is listed in the window.

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Recovery discs

HP recommends that you create recovery discs to be sure that you can restore your computer to its original factory state if the hard drive fails, or if for any reason you cannot recover using the recovery partition tools. Create these discs after setting up the computer for the first time.

Handle these discs carefully and keep them in a safe place. The software allows the creation of only one set of recovery discs.

NOTE: If your computer does not include an integrated optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can purchase recovery discs for your computer from the HP Web site. If you use an external optical drive, it must be connected directly to a USB port on the computer, not to a USB port on an external device, such as a USB hub.

Guidelines:

- Purchase high-quality DVD-R, DVD+R, BD-R (writable Blu-ray), or CD-R discs. DVDs and BDs have a much higher storage capacity than CDs. If you use CDs, up to 20 discs may be required, whereas only a few DVDs or BDs are required.
- NOTE: Read-write discs, such as CD-RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) discs, are not compatible with the Recovery Manager software.
- The computer must be connected to AC power during this process.
- Only one set of recovery discs can be created per computer.
- Number each disc before inserting it into the optical drive.
- If necessary, you can exit the program before you have finished creating the recovery discs. The next time you open Recovery Manager, you will be prompted to continue the disc creation process.

To create a set of recovery discs:

- 1. Select Start > All Programs > Recovery Manager > Recovery Disc Creation.
- Follow the on-screen instructions.

Performing a system recovery

Recovery Manager software allows you to repair or restore the computer to its original factory state. Recovery Manager works from recovery discs or from a dedicated recovery partition (select models only) on the hard drive.

Note the following when performing a system recovery:

- You can recover only files that you have previously backed up. HP recommends that you use HP Recovery Manager to create a set of recovery discs (entire drive backup) as soon as you set up the computer.
- Windows has its own built-in repair features, such as System Restore. If you have not already tried these features, try them before using Recovery Manager.
- Recovery Manager recovers only software that was preinstalled at the factory. Software not
 provided with this computer must be downloaded from the manufacturer's Web site or reinstalled
 from the disc provided by the manufacturer.

Recovering using the dedicated recovery partition (select models only)

On some models, you can perform a recovery from the partition on the hard drive, accessed by clicking **Start** or pressing the f11 key. This type of recovery restores the computer to its factory condition without using recovery discs.

To restore the computer from the partition, follow these steps:

- 1. Access Recovery Manager in either of the following ways:
 - Select Start > All Programs > Recovery Manager > Recovery Manager.
 - or -
 - Turn on or restart the computer, and then press esc while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen. Then, press f11 while the "F11 (HP Recovery)" message is displayed on the screen.
- Click System Recovery in the Recovery Manager window.
- 3. Follow the on-screen instructions.

Recovering using the recovery discs

- If possible, back up all personal files.
- Insert the first recovery disc into the optical drive on your computer or an optional external optical drive, and then restart the computer.
- 3. Follow the on-screen instructions.

Backing up your information

You should back up your computer files on a regular schedule to maintain a current backup. You can back up your information to an optional external hard drive, a network drive, or discs. Back up your system at the following times:

- At regularly scheduled times
- NOTE: Set reminders to back up your information periodically.
- Before the computer is repaired or restored
- Before you add or modify hardware or software

Guidelines:

- Create system restore points using the Windows® System Restore feature, and periodically
 copy them to an optical disc or an external hard drive. For more information on using system
 restore points, refer to Using system restore points on page 44.
- Store personal files in the Documents library and back up this folder periodically.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

Using Windows Backup and Restore

Windows Backup and Restore allows you to back up individual files or back up the entire computer image.

Guidelines:

- Be sure that the computer is connected to AC power before you start the backup process.
- Allow enough time to complete the backup process. Depending on file sizes, it may take over an hour.

To create a backup:

- Select Start > Control Panel > System and Security > Backup and Restore.
- 2. Follow the on-screen instructions to schedule and create a backup.
- NOTE: Windows® includes the User Account Control feature to improve the security of the computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

Using system restore points

A system restore point allows you to save and name a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes.

NOTE: Recovering to an earlier restore point does not affect data files saved or e-mails created since the last restore point.

You also can create additional restore points to provide increased protection for your files and settings.

When to create restore points

- Before you add or extensively modify software or hardware
- Periodically, whenever the computer is functioning optimally
- NOTE: If you revert to a restore point and then change your mind, you can reverse the restoration.

Create a system restore point

- 1. Select Start > Control Panel > System and Security > System.
- 2. In the left pane, click System Protection.
- 3. Click the **System Protection** tab.
- Follow the on-screen instructions.

Restore to a previous date and time

To revert to a restore point (created at a previous date and time), when the computer was functioning optimally, follow these steps:

- 1. Select Start > Control Panel > System and Security > System.
- 2. In the left pane, click System protection.
- 3. Click the **System Protection** tab.
- 4. Click System Restore.
- Follow the on-screen instructions.

7 Customer support

Contacting Customer Support

If the information provided in this *Getting Started* guide, in the *HP Notebook Reference Guide*, or in Help and Support does not address your questions, you can contact HP Customer Support at:

http://www.hp.com/go/contactHP

NOTE: For worldwide support, click **Contact HP worldwide** on the left side of the page, or go to http://welcome.hp.com/country/us/en/wwcontact_us.html.

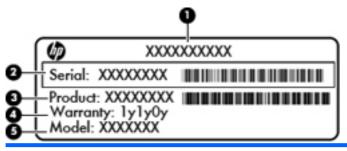
Here you can:

- Chat online with an HP technician.
- NOTE: When technical support chat is not available in a particular language, it is available in English.
- E-mail HP Customer Support.
- Find HP Customer Support worldwide telephone numbers.
- Locate an HP service center.

Labels

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

Serial number label—Provides important information, including the following:



Component		
(1)	Product name	
(2)	Serial number (s/n)	
(3)	Part number/Product number (p/n)	
(4)	Warranty period	
(5)	Model description	

Have this information available when you contact technical support. The serial number label is located inside the battery bay.

 Microsoft® Certificate of Authenticity—Contains the Windows Product Key. You may need the Product Key to update or troubleshoot the operating system. The Microsoft Certificate of Authenticity is located on the bottom of the computer.

- Regulatory label—Provides regulatory information about the computer. The regulatory label is affixed inside the battery bay.
- Wireless certification label or labels (select models only)—Provide information about optional
 wireless devices and the approval markings of some of the countries or regions in which the
 devices have been approved for use. If your computer model includes one or more wireless
 devices, one or more certification labels are included with your computer. You may need this
 information when traveling internationally. Wireless certification labels are located inside the
 battery bay.
- SIM (subscriber identity module) label (select models only)—Provides the ICCID (Integrated Circuit Card Identifier) of the SIM. This label is located inside the battery bay.
- HP Mobile Broadband Module serial number label (select models only)—Provides the serial number of the HP Mobile Broadband Module. This label is located inside the battery bay.

8 Specifications

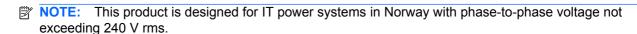
Input power

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. The AC power source must be rated at 100–240 V, 50–60 Hz. Although the computer can be powered from a standalone DC power source, it should be powered only with an AC adapter or a DC power source supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications. Your computer uses one of the following adapters.

Input power	Rating
Operating voltage and operating current	19.0 V dc @ 4.74 A - 90 W
Operating voltage and operating current (Slim Adapter)	19.5 V dc @ 4.62 A - 90 W



NOTE: The computer operating voltage and current can be found on the system regulatory label located inside the battery bay.

Operating environment

Factor	Metric	U.S.
Temperature		
Operating (writing to optical disc)	5°C to 35°C	41°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)		

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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

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