

1 securing clips (2)

2 memory module

Replacing the DIMM B Memory Module

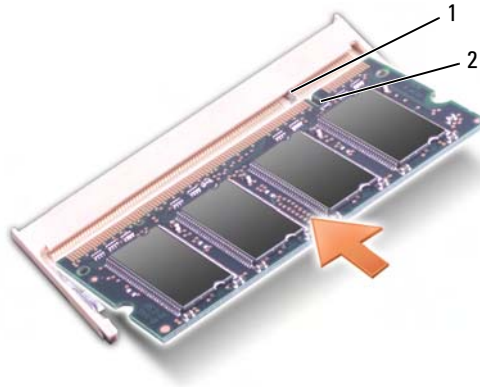


NOTICE: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on the back of the computer).

- 1 Align the notch in the module edge connector with the tab in the connector slot.
- 2 Slide the module firmly into the slot at a 45-degree angle, and rotate the module down until it clicks into place. If you do not feel the click, remove the module and reinstall it.



NOTE: If the memory module is not installed properly, the computer may not boot. No error message indicates this failure.



1 tab

2 notch

NOTICE: If the cover is difficult to close, remove the module and reinstall it. Forcing the cover to close may damage your computer.

- 3 Replace the memory module cover.
- 4 Insert the battery into the battery bay, or connect the AC adapter to your computer and an electrical outlet.
- 5 Turn on the computer.

As the computer boots, it detects the additional memory and automatically updates the system configuration information.


To confirm the amount of memory installed in the computer, click **Start** → **Help and Support** → **Dell System Information**.

Subscriber Identity Module

Subscriber Identity Modules (SIM) identify users uniquely through an International Mobile Subscriber Identity.



CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

 **NOTE:** Only GSM (HSDPA) type cards need a SIM. EVDO cards do not use a SIM.


- 1 Follow the procedures in "Before You Begin" on page 137.
- 2 In the battery bay, slide the SIM into the compartment with the cut-off corner of the card facing away from the compartment.




1 battery bay

2 SIM

Wireless Mini Cards

 **CAUTION:** Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

 **NOTICE:** To help prevent damage to the system board, you must remove the battery from the battery bay before you begin working inside the computer.

If you ordered a wireless Mini Card with your computer, the card is already installed. Your computer supports three types of wireless Mini Cards:

- Wireless Local Area Network (WLAN)

- Mobile Broadband or Wireless Wide Area Network (WWAN)
- Wireless Personal Area Network (WPAN)

Removing a WLAN Card

- 1** Follow the procedures in "Before You Begin" on page 137.
- 2** Turn the computer over.
- 3** Loosen the captive screws on the cover of the Mini Card compartment and remove the cover.



1 captive screws (2)

2 cover

- 4** Disconnect the antenna cables from the WLAN card.



1 antenna cable connectors (2)

2 WLAN card

- 5** Release the WLAN card by pushing the metal securing tabs toward the back of the computer until the card pops up slightly.
- 6** Lift the WLAN card out of its system board connector.



- | | | | |
|---|-------------------------|---|-----------|
| 1 | metal securing tabs (2) | 2 | WLAN card |
| 3 | mylar sleeve | | |

Replacing a WLAN Card

➔ **NOTICE:** The connectors are keyed to ensure correct insertion. If you feel resistance, check the connectors on the card and on the system board, and realign the card.

➔ **NOTICE:** To avoid damage to the WLAN card, never place cables under the card.

- 1 Insert the WLAN card connector into the system board connector labeled "WLAN" at a 45-degree angle.
- 2 Press the other end of the WLAN card down into the securing tabs until the card clicks into place.

- 3 Connect the appropriate antenna cables to the WLAN card you are installing:

If the WLAN card has two triangles on the label (white and black), connect the white antenna cable to the connector labeled "main" (white triangle), and connect the black antenna cable to the connector labeled "aux" (black triangle).

If the WLAN card has three triangles on the label (white, black, and gray), connect the white antenna cable to the white triangle, connect the black antenna cable to the black triangle, and connect the gray antenna cable to the gray triangle.

- 4 Secure unused antenna cables in the protective mylar sleeve.
- 5 Replace the cover and tighten the captive screws.

Removing a Mobile Broadband or WWAN Card



NOTE: WWAN is also available on an ExpressCard (see "Using ExpressCards" on page 77).

- 1 Follow the procedures in "Before You Begin" on page 137.
- 2 Turn the computer over.
- 3 Loosen the captive screws on the cover of the Mini Card compartment and remove the cover.



1 captive screws (2)

2 cover

- 4 Disconnect the two antenna cables from the WWAN card.



- 1 antenna cable connectors (2) 2 WWAN card

- 5 Release the WWAN card by pushing the metal securing tabs toward the back of the computer until the card pops up slightly.
- 6 Lift the WWAN card out of its system board connector.



- | | | | |
|---|-------------------------|---|-----------|
| 1 | metal securing tabs (2) | 2 | WWAN card |
| 3 | mylar sleeve | | |

Replacing a WWAN Card

- ➔ **NOTICE:** The connectors are keyed to ensure correct insertion. If you feel resistance, check the connectors on the card and on the system board, and realign the card.
 - ➔ **NOTICE:** To avoid damage to the WWAN card, never place cables under the card.
- 1 Insert the WWAN card connector into the system board connector labeled "WWAN" at a 45-degree angle.
 - 2 Press the other end of the WWAN card down into the securing tabs until the card clicks into place.

- 3 Connect the black antenna cable with a gray stripe to the connector labeled "aux" (black triangle) and connect the white antenna cable with a gray stripe to the connector labeled "main" (white triangle).
- 4 Secure unused antenna cables in the protective mylar sleeve.
- 5 Replace the cover and tighten the captive screws.

Removing a WPAN Card

- 1 Follow the procedures in "Before You Begin" on page 137.
- 2 Turn the computer over.
- 3 Loosen the captive screws on the cover of the Mini Card compartment and remove the cover.



- 1 captive screws (2) 2 cover

- 4 Disconnect the blue antenna cable from the WPAN card.
- 5 Release the WPAN card by pushing the metal securing tabs toward the back of the computer until the card pops up slightly.
- 6 Lift the WPAN card out of its system board connector.

Replacing a WPAN Card



NOTICE: The connectors are keyed to ensure correct insertion. If you feel resistance, check the connectors on the card and on the system board, and realign the card.




NOTICE: To avoid damage to the WPAN card, never place cables under the card.

- 1 Insert the WPAN card connector into the system board connector labeled "WPAN" at a 45-degree angle.
- 2 Press the other end of the WPAN card down into the securing tabs until the card clicks into place.
- 3 Connect the blue antenna cable to the WPAN card.
- 4 Secure unused antenna cables in the protective mylar sleeve.
- 5 Replace the cover and tighten the captive screws.

Flash Cache Module

The Flash Cache Module (FCM) is an internal flash drive that helps improve the performance of your computer. If you ordered an FCM with your computer, the card is already installed.

Removing the FCM

- 1 Follow the procedures in "Before You Begin" on page 137.
 - 2 Turn the computer over and remove the cover on the Mini Card compartment.
 - 3 Ground yourself by touching one of the metal connectors on the back of the computer.
-  **NOTE:** If you leave the area, ground yourself again when you return to the computer.
- 4 Release the FCM by pushing the metal securing brackets away from the card until the card pops up slightly.
 - 5 Remove the FCM.



1 metal securing tabs (2)

2 FCM

Replacing the FCM

➡ NOTICE: Install the FCM in the WWAN or WPAN slot. Do not install an FCM in the WLAN card slot. Doing so may cause damage to your computer.

- 1 Insert the FCM connector into the system board connector at a 45-degree angle
- 2 Press the other end of the FCM down into the securing tabs until the card clicks into place.

Internal Card With Bluetooth[®] Wireless Technology



CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.



NOTICE: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on the back of the computer).



NOTICE: To help prevent damage to the system board, you must remove the battery from the battery bay before you begin working inside the computer.

If you ordered a card with Bluetooth wireless technology with your computer, it is already installed.

Removing the Card

- 1 Follow the procedures in "Before You Begin" on page 137.
- 2 Remove the hinge cover (see "Hinge Cover" on page 143).
- 3 Disconnect the cable on the card.
- 4 Grasp the connector end of the card and slide it out from under the securing tabs.



- | | | | |
|---|--------------|---|-------|
| 1 | securing tab | 2 | card |
| 3 | securing tab | 4 | cable |

Replacing the Card

- 1 Replace the card at an angle to slide it under the securing tabs in the card compartment.
- 2 Connect the cable to the card.

Coin-Cell Battery



CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.



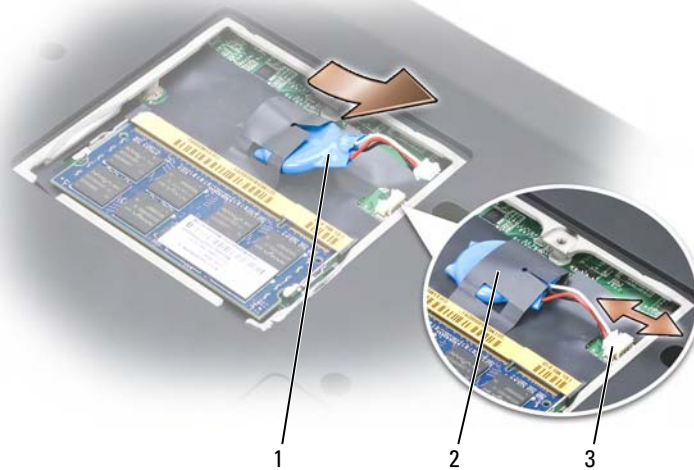
NOTICE: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on the back of the computer).



NOTICE: To help prevent damage to the system board, you must remove the battery from the battery bay before you begin working inside the computer.

Removing the Coin-Cell Battery

- 1 Follow the procedures in "Before You Begin" on page 137.
- 2 Turn the computer over.
- 3 Loosen the captive screw on the memory module/coin-cell battery cover (see "Bottom View" on page 31), and remove the cover.
- 4 Disconnect the coin-cell battery cable from the system board.



- | | | | |
|---|-------------------------|---|--------------|
| 1 | coin-cell battery | 2 | mylar sleeve |
| 3 | battery cable connector | | |

- 5 Slide the battery out of the mylar sleeve.

Replacing the Coin-Cell Battery

- 1 Connect the coin-cell battery cable to the system board.
- 2 Slide the coin-cell battery into the mylar sleeve.
- 3 Replace the cover and tighten the captive screw.

Dell™ QuickSet Features



NOTE: This feature may not be available on your computer.

Dell QuickSet provides you with easy access to configure or view the following types of settings:

- Network connectivity
- Power management
- Display
- System information

Depending on what you want to do in Dell QuickSet, you can start it by either *clicking*, *double-clicking*, or *right-clicking* the QuickSet icon in the Microsoft® Windows® notification area. The notification area is located in the lower-right corner of your screen.

For more information about QuickSet, right-click the QuickSet icon and select **Help**.

Traveling With Your Computer

Identifying Your Computer

- Attach a name tag or business card to the computer.
- Write down your Service Tag and store it in a safe place away from the computer or carrying case. Use the Service Tag if you need to report a loss or theft to law enforcement officials and to Dell.
- Create a file on the Microsoft® Windows® desktop called **if_found**. Place information such as your name, address, and phone number in this file.
- Contact your credit card company and ask if it offers coded identification tags.

Packing the Computer

- Remove any external devices attached to the computer and store them in a safe place.
- Fully charge the main battery and any spare batteries that you plan to carry with you.
- Shut down the computer.
- Disconnect the AC adapter.



NOTICE: When the display is closed, extraneous items on the keyboard or palm rest could damage the display.

- Remove any extraneous items, such as paper clips, pens, and paper, from the keyboard and palm rest and close the display.
- Use the optional Dell carrying case to pack the computer and its accessories together safely.
- Avoid packing the computer with items such as shaving cream, colognes, perfumes, or food.



NOTICE: If the computer has been exposed to extreme temperatures, allow it to acclimate to room temperature for 1 hour before turning it on.

- Protect the computer, the batteries, and the hard drive from hazards such as extreme temperatures and overexposure to sunlight, dirt, dust, or liquids.
- Pack the computer so that it does not slide around in the trunk of your car or in an overhead storage compartment.

Travel Tips

➡ **NOTICE:** Do not move the computer while using the optical drive to prevent loss of data.

➡ **NOTICE:** Do not check the computer as baggage.

- Consider disabling wireless activity on your computer to maximize battery operating time. To disable wireless activity, use the wireless switch (see "wireless switch" on page 25).
- Consider changing your power management options to maximize battery operating time (see "Configuring Power Management Settings" on page 50).
- If you are traveling internationally, carry proof of ownership—or of your right to use the computer if it is company-owned—to speed your passage through customs. Investigate the customs regulations of the countries you plan to visit, and consider acquiring an international carnet (also known as a *merchandise passport*) from your government.
- Find out what type of electrical outlets are used in the countries you will visit, and have appropriate power adapters.
- Check with your credit card company for information about the kinds of emergency travel assistance it offers to users of portable computers.


Traveling by Air

➡ **NOTICE:** Do not walk the computer through a metal detector. Send the computer through an X-ray machine or have it hand-inspected.

- Ensure that you have a charged battery available in case you are asked to turn on the computer.
- Prior to entering the airplane, verify that using a computer is permitted. Some airlines forbid the use of electronic devices during flight. All airlines forbid the use of electronic devices during takeoff and landing.


Getting Help


Obtaining Assistance

 **CAUTION:** If you need to remove the computer cover, first disconnect the computer power and modem cables from all electrical outlets.

If you experience a problem with your computer, you can complete the following steps to diagnose and troubleshoot the problem:


- 1 See "Troubleshooting" on page 99 for information and procedures that pertain to the problem your computer is experiencing.
- 2 See "Dell Diagnostics" on page 99 for procedures on how to run Dell Diagnostics.
- 3 Fill out the "Diagnostics Checklist" on page 176.
- 4 Use Dell's extensive suite of online services available at Dell Support (support.dell.com) for help with installation and troubleshooting procedures. See "Online Services" on page 172 for a more extensive list of Dell Support online.
- 5 If the preceding steps have not resolved the problem, see "Contacting Dell" on page 177.

 **NOTE:** Call Dell Support from a telephone near or at the computer so that the support staff can assist you with any necessary procedures.

 **NOTE:** Dell's Express Service Code system may not be available in all countries.

When prompted by Dell's automated telephone system, enter your Express Service Code to route the call directly to the proper support personnel. If you do not have an Express Service Code, open the **Dell Accessories** folder, double-click the **Express Service Code** icon, and follow the directions.

For instructions on using the Dell Support, see "Technical Support and Customer Service" on page 172.

 **NOTE:** Some of the following services are not always available in all locations outside the continental U.S. Call your local Dell representative for information on availability.

Technical Support and Customer Service

Dell's support service is available to answer your questions about Dell™ hardware. Our support staff uses computer-based diagnostics to provide fast, accurate answers.

To contact Dell's support service, see "Before You Call" on page 175, and then see "Contacting Dell" on page 177.

DellConnect

DellConnect is a simple online access tool that allows a Dell service and support associate to access your computer through a broadband connection, diagnose your problem and repair it all under your supervision. For more information, go to support.dell.com and click DellConnect.

Online Services

You can learn about Dell products and services on the following websites:

www.dell.com

www.dell.com/ap (Asian/Pacific countries only)

www.dell.com/jp (Japan only)

www.euro.dell.com (Europe only)

www.dell.com/la (Latin American and Caribbean countries)

www.dell.ca (Canada only)

You can access Dell Support through the following websites and e-mail addresses:

- Dell Support websites
support.dell.com
support.jp.dell.com (Japan only)
support.euro.dell.com (Europe only)
- Dell Support e-mail addresses
mobile_support@us.dell.com
support@us.dell.com

la-techsupport@dell.com (Latin America and Caribbean countries only)

apsupport@dell.com (Asian/Pacific countries only)

- Dell Marketing and Sales e-mail addresses
apmarketing@dell.com (Asian/Pacific countries only)
sales_canada@dell.com (Canada only)
- Anonymous file transfer protocol (FTP)
ftp.dell.com

Log in as user: `anonymous`, and use your e-mail address as your password.

AutoTech Service

Dell's automated support service—AutoTech—provides recorded answers to the questions most frequently asked by Dell customers about their portable and desktop computers.

When you call AutoTech, use your touch-tone telephone to select the subjects that correspond to your questions. For the telephone number to call for your region, see "Contacting Dell" on page 177.

Automated Order-Status Service

To check on the status of any Dell products that you have ordered, you can go to support.dell.com, or you can call the automated order-status service. A recording prompts you for the information needed to locate and report on your order. For the telephone number to call for your region, see "Contacting Dell" on page 177.

Problems With Your Order

If you have a problem with your order, such as missing parts, wrong parts, or incorrect billing, contact Dell for customer assistance. Have your invoice or packing slip handy when you call. For the telephone number to call for your region, see "Contacting Dell" on page 177.

Product Information

If you need information about additional products available from Dell, or if you would like to place an order, visit the Dell website at www.dell.com. For the telephone number to call for your region or to speak to a sales specialist, see "Contacting Dell" on page 177.

Returning Items for Warranty Repair or Credit

Prepare all items being returned, whether for repair or credit, as follows:

- 1 Call Dell to obtain a Return Material Authorization Number, and write it clearly and prominently on the outside of the box.
For the telephone number to call for your region, see "Contacting Dell" on page 177.
- 2 Include a copy of the invoice and a letter describing the reason for the return.
- 3 Include a copy of the Diagnostics Checklist (see "Diagnostics Checklist" on page 176), indicating the tests that you have run and any error messages reported by the Dell Diagnostics (see "Dell Diagnostics" on page 99).
- 4 Include any accessories that belong with the item(s) being returned (power cables, software floppy disks, guides, and so on) if the return is for credit.
- 5 Pack the equipment to be returned in the original (or equivalent) packing materials.

You are responsible for paying shipping expenses. You are also responsible for insuring any product returned, and you assume the risk of loss during shipment to Dell. Collect On Delivery (C.O.D.) packages are not accepted.

Returns that are missing any of the preceding requirements will be refused at Dell's receiving dock and returned to you.

Before You Call



NOTE: Have your Express Service Code ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently. You may also be asked for your Service Tag (located on the back or bottom of your computer).

Remember to fill out the Diagnostics Checklist (see "Diagnostics Checklist" on page 176). If possible, turn on your computer before you call Dell for assistance and call from a telephone at or near the computer. You may be asked to type some commands at the keyboard, relay detailed information during operations, or try other troubleshooting steps possible only at the computer itself. Ensure that the computer documentation is available.



CAUTION: Before working inside your computer, follow the safety instructions in your *Product Information Guide*.

Diagnostics Checklist

Name:

Date:

Address:

Phone number:

Service Tag (bar code on the back or bottom of the computer):

Express Service Code:

Return Material Authorization Number (if provided by Dell support technician):

Operating system and version:

Devices:

Expansion cards:

Are you connected to a network? Yes No

Network, version, and network adapter:

Programs and versions:

See your operating system documentation to determine the contents of the system's start-up files. If the computer is connected to a printer, print each file. Otherwise, record the contents of each file before calling Dell.

Error message, beep code, or diagnostic code:

Description of problem and troubleshooting procedures you performed:

Contacting Dell




NOTE: If you do not have an active Internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

- 1 Visit support.dell.com.
- 2 Verify your country or region in the **Choose A Country/Region** drop-down menu at the bottom of the page.
- 3 Click **Contact Us** on the left side of the page.
- 4 Select the appropriate service or support link based on your need.
- 5 Choose the method of contacting Dell that is convenient for you.

Specifications



NOTE: Offerings may vary by region. For more information regarding the configuration of your computer, click **Start** , click **Help and Support**, and then select the option to view information about your computer.

Processor	
Processor type	Intel® Core™ 2 Duo
L1 cache	32 KB per instruction 32 KB data cache per core
L2 cache	2 MB or 4 MB per core depending on model
Front side bus frequency	533 MHz and 800 MHz
System Information	
System chipset	Intel 965 Express Chipset Family
Data bus width	64 bits
DRAM bus width	dual-channel (2) 64-bit buses
Processor address bus width	32 bits
Flash EPROM	1 MB
Graphics bus	PCI-E X16
PCI bus (PCI-Express used for video controllers)	32 bits x16
ExpressCard	
NOTE: The ExpressCard slot is designed only for ExpressCards. It does NOT support PC Cards.	
NOTE: PCMCIA may not be available in some regions.	
ExpressCard controller	Intel ICH8M
ExpressCard connector	one ExpressCard slot (54 mm)

ExpressCard (continued)

Cards supported	ExpressCard/34 (34 mm)
	ExpressCard/54 (54 mm)
	1.5 V and 3.3 V
ExpressCard connector size	26 pins

8-in-1 Memory Card Reader

8-in-1 memory card controller	Ricoh R5C833
8-in-1 memory card connector	8-in-1 combo card connector
Cards supported	<ul style="list-style-type: none">• Secure Digital (SD)• SDIO• MultiMediaCard (MMC)• Memory Stick• Memory Stick PRO• xD-Picture Card• Hi Speed-SD• Hi Density-SD

Memory

Memory module connector	two user-accessible SoDIMM connectors
Memory module capacities	512 MB, 1 GB, 2 GB
Memory type	667 MHz SoDIMM DDR2
Minimum memory	512 MB
Maximum memory	4 GB

NOTE: In order to take advantage of the dual channel bandwidth capability, both memory slots must be populated and must match in size.

NOTE: The available memory displayed does not reflect the complete maximum memory installed because some memory is reserved for system files.

Ports and Connectors

Audio	microphone connector, stereo headphone/speakers connector
-------	--

Ports and Connectors *(continued)*

IEEE 1394	4-pin serial connector
Consumer IR	sensor compatible with Philips RC6 (receive only)
Mini Card	three Type IIIA Mini Card slots
Modem	RJ-11 port
Network adapter	RJ-45 port
S-video TV-out	7-pin mini-DIN connector (optional S-video to composite video adapter cable)
USB	four 4-pin USB 2.0-compliant connector
Video	15-hole connector

Communications

Modem:

Type	v.92 56K MDC
Controller	softmodem
Interface	Intel High-Definition Audio
Network adapter	10/100 Ethernet LAN on system board
Wireless	internal WLAN, WWAN, WPAN Mini Cards
	WWAN ExpressCard
	Bluetooth® wireless technology

Video

NOTE: Optional video controller upgrades are available for your computer subject to availability at the time of purchase. To determine the configuration of your computer, see "Determining Your Computer's Configuration" on page 19.

Video type:	integrated on system board
Video controller	Intel 965 GM
Video memory	dynamic based on system memory capacity
LCD interface	LVDS

Video (*continued*)

TV support	NTSC or PAL in S-video, composite, and component modes
Video type:	discrete video card
Data bus	PCI Express X16
Video controller	nVIDIA GeForce 8400M GS or nVIDIA GeForce 8600M GT
Video memory	128 MB (GeForce 8400M GS) or 256 MB (GeForce 8600M GT)
LCD interface	LVDS
TV support	NTSC or PAL in S-video, composite, and component modes

Audio

Audio type	two-channel high-definition stereo
Audio controller	Sigmatel STAC9205 High Definition Audio codec
Stereo conversion	24-bit (analog-to-digital and digital-to-analog)
Interfaces:	
Internal	Intel High Definition Audio
External	microphone-in connector, stereo headphones/speakers connector
Speaker	two 4-ohm speakers
Internal speaker amplifier	2 Watts per channel into 4 ohms
Internal microphone	Dual digital microphone array
Volume controls	program menus, media control buttons

Display	
Type (active-matrix TFT)	15.4-inch WXGA 15.4-inch WXGA with TrueLife 15.4-inch WXGA+ with TrueLife 15.4-inch WSXGA+ with TrueLife

Display (continued)

Dimensions:

Height	222.5 mm (8.8 in)
Width	344.5 mm (13.6 in)
Diagonal	391.2 mm (15.4 in)

Maximum resolutions:

WXGA	1280 x 800 at 262 K colors
WXGA with TrueLife	1280 x 800 at 262 K colors
WXGA+ with TrueLife	1440 x 900 at 262 K colors
WSXGA+ with TrueLife	1680 x 1050 at 262 K colors

Refresh rate 60 Hz

Operating angle 0° (closed) to 155°

Viewing angles:

Horizontal	±40° (WXGA) ±40° (WXGA with TrueLife) ±55° (WXGA+ with TrueLife) ±60° (WSXGA+ with TrueLife)
Vertical	+15°/-30° (WXGA) +15°/-30° (WXGA with TrueLife) ±45° (WXGA+ with TrueLife) +40°/-50° (WSXGA+ with TrueLife)

Pixel pitch:

WXGA	0.258 mm
WXGA with TrueLife	0.258 mm
WXGA+ with TrueLife	0.2304 mm
WSXGA+ with TrueLife	0.197 mm

Controls brightness can be controlled through keyboard shortcuts (see "Display Functions" on page 42)

Keyboard	
Number of keys	87 (U.S. and Canada); 88 (Europe); 91 (Japan)
Layout	QWERTY/AZERTY/Kanji
Touch Pad	
XY position resolution (graphics table mode)	240 cpi
Size:	
Width	71.7-mm (2.8-in) sensor-active area
Height	34.0-mm (1.3-in) rectangle
Battery	
Type	9-cell "smart" lithium ion 6-cell "smart" lithium ion
Dimensions:	
Depth	67.6 mm (2.66 in) (9 cell) 47.5 mm (1.87 in) (6 cell)
Height	20.4 mm (0.8 in)
Width	209.9 mm (8.26 in)
Weight	0.48 kg (1.06 lb) (9 cell) 0.33 kg (0.7 lb) (6 cell)
Voltage	11.1 VDC
Charge time (approximate):	
Computer off	4 hours
Operating time	Battery operating time varies depending on operating conditions and can be significantly reduced under certain power-intensive conditions (see "Power Problems" on page 120). See "Using a Battery" on page 47 for more information on battery life.

Battery (continued)

Life span (approximate)	300 discharge/charge cycles
Temperature range:	
Operating	0° to 35°C (32° to 95°F)
Storage	-40° to 65°C (-40° to 149°F)
Coin-cell battery	CR-2032

AC Adapter

Input voltage	90–264 VAC
Input current (maximum)	1.5 A
Input frequency	47–63 Hz
Output current (65 W)	4.34 A (maximum at 4-second pulse) 3.34 A (continuous)
Output current (90 W)	5.62 A (maximum at 4-second pulse) 4.62 A (continuous)

NOTE: If your computer has the discrete video configuration, you must use the 90 W AC adapter that is shipped with your computer. Using the incorrect AC adapter will prevent optimal system performance and produce a BIOS warning.

Output power	65 W, 90 W
Rated output voltage	19.5 +/- 1.0 VDC
Dimensions (65 W):	
Height	28.2 mm (1.11 in)
Width	57.9 mm (2.28 in)
Depth	137.2 mm (5.4 in)
Weight (with cables)	0.4 kg (0.9 lb)
Dimensions (90 W):	
Height	34.2 mm (1.34 in)
Width	60.8 mm (2.39 in)
Depth	153.4 mm (6.0 in)
Weight (with cables)	0.46 kg (1.01 lb)

AC Adapter (continued)

Temperature range:

Operating	0° to 35°C (32° to 95°F)
Storage	–40° to 65°C (–40° to 149°F)

Physical

Height	42 mm (1.65 in)
Width	358.7 mm (14.12 in)
Depth	269 mm (10.59 in)
Weight (with 6-cell battery):	
Configurable to less than	3.0 kg (6.61 lb)

Environmental

Temperature range:

Operating	0° to 35°C (32° to 95°F)
Storage	–40° to 65°C (–40° to 149°F)

Relative humidity (maximum):

Operating	10% to 90% (noncondensing)
Storage	5% to 95% (noncondensing)

Maximum vibration (using a random vibration spectrum that simulates user environment):

Operating	0.66 GRMS
Storage	1.3 GRMS

Maximum shock (Measured with hard drive in operating status and a 2-ms half-sine pulse for operating. Also measured with hard drive in head-parked position and a 2-ms halfsine pulse for storage):

Operating	142 G
Storage	163 G

Environmental *(continued)*

Altitude (maximum):



Operating	–15.2 to 3048 m (–50 to 10,000 ft)
Storage	–15.2 to 10,668 m (–50 to 35,000 ft)

Camera (optional)

Still Resolution	2 Mega-Pixel
Video Resolution	640 x 480 at 30 fps
Camera activation	Desktop icon

Appendix

Using the System Setup Program

 **NOTE:** Your operating system may automatically configure most of the options available in system setup, thus overriding options that you set through system setup. An exception is the **External Hot Key** option, which you can disable or enable only through system setup. For more information on configuring features for your operating system, see Windows Help and Support (click **Start** , and then click **Help and Support**).


You can use system setup as follows:

- To set or change user-selectable features such as your computer password
- To verify information about the computer's current configuration such as the amount of system memory

After you set up the computer, run system setup to familiarize yourself with your system configuration information and optional settings. You may want to write down the information for future reference.

The system setup screens display the current setup information and settings for your computer, such as:

- System configuration
- Boot order
- Boot (start-up) configuration
- Basic device configuration settings
- System security and hard drive password settings

 **NOTE:** Unless you are an expert computer user or are directed to do so by Dell technical support, do not change the system setup settings. Certain changes might make your computer work incorrectly.

Viewing the System Setup Screen

- 1 Turn on (or restart) your computer.
- 2 When the DELL logo appears, press <F2> immediately.
If you wait too long and the Microsoft Windows logo appears, continue to wait until you see the Windows desktop, then shut down your computer and try again.

System Setup Screen



NOTE: For information about a specific item on a system setup screen, highlight the item and see the **Help** area on the screen.

On each screen, the system setup options are listed at the left. To the right of each option is the setting or value for that option. You can change settings that appear as white type on the screen. Options or values that you cannot change (because they are determined by the computer) appear less bright.

The upper-right corner of the screen displays help information for the currently highlighted option; the lower-right corner displays information about the computer. System setup key functions are listed across the bottom of the screen.

Commonly Used Options

Certain options require that you reboot the computer for new settings to take effect.

Changing the Boot Sequence

The *boot sequence*, or *boot order*, tells the computer where to look to find the software needed to start the operating system. You can control the boot sequence and enable/disable devices using the **Boot Order** page of the system setup program.



NOTE: To change the boot sequence on a one-time-only basis, see "Performing a One-Time Boot" on page 191.

The **Boot Order** page displays a general list of the bootable devices that may be installed in your computer, including but not limited to the following:

- Diskette Drive
- Internal HDD

- USB Storage Device
- CD/DVD/CD-RW drive
- Modular bay HDD



NOTE: Only devices that are preceded by a number are bootable.

During the boot routine, the computer starts at the top of the list and scans each enabled device for the operating system start-up files. When the computer finds the files, it stops searching and starts the operating system.

To control the boot devices, select (highlight) a device by pressing the down-arrow or up-arrow key, and then enable or disable the device or change its order in the list.

- To enable or disable a device, highlight the item and press the space bar. Enabled items are preceded by a number; disabled items are not preceded by a number.
- To reorder a device in the list, highlight the device and press <u> to move the device up the list or <d> to move a device down the list.

Boot sequence changes take effect as soon as you save the changes and exit the system setup program.

Performing a One-Time Boot

You can set a one-time-only boot sequence without entering the system setup program (you can also use this procedure to boot the Dell Diagnostics on the diagnostics utility partition on your hard drive).

- 1** Shut down the computer through the **Start** menu.
- 2** Connect the computer to an electrical outlet.
- 3** Turn on the computer. When the DELL logo appears, press <F12> immediately.

If you wait too long and the Windows logo appears, continue to wait until you see the Windows desktop, then shut down your computer and try again.

- 4** When the boot device list appears, highlight the device from which you want to boot and press <Enter>.

The computer boots to the selected device.

The next time you reboot the computer, the previous boot order is restored.

Cleaning Your Computer



CAUTION: Before you begin any of the procedures in this section, follow the safety instructions located in the *Product Information Guide*.

Computer, Keyboard, and Display



CAUTION: Before you clean your computer, disconnect the computer from the electrical outlet and remove any installed batteries. Clean your computer with a soft cloth dampened with water. Do not use liquid or aerosol cleaners, which may contain flammable substances.

- Use a can of compressed air to remove dust from between the keys on the keyboard and to remove any dirt or lint from the display.
 - ➡ **NOTICE:** To help prevent damage to the computer or display, do not spray cleaning solution directly onto the display. Only use products specifically designed for cleaning displays, and follow the instructions that are included with the product.
 - Moisten a soft, lint-free cloth with either water or a display cleaner. Do not use alcohol or an ammonia-based cleaner. Wipe the display gently working from the center to the edges until it is clean and any fingerprints are removed. Do not use excessive pressure.
 - ➡ **NOTICE:** To prevent damage to the antiglare coating, do not wipe the display with soap or alcohol.
 - Moisten a soft, lint-free cloth with water and wipe the computer and keyboard. Do not allow water from the cloth to seep between the touch pad and the surrounding palm rest.
 - To clean your monitor screen, lightly dampen a soft, clean cloth with water. You can also use a special screen-cleaning tissue or solution suitable for the monitor's antistatic coating.
 - Wipe the keyboard, computer, and monitor plastics with a soft cleaning cloth moistened with a solution of three parts water and one part dishwashing detergent.
- Do not soak the cloth or let water drip inside your computer or keyboard.

Touch Pad

- 1 Shut down and turn off your computer (see "Turning Off Your Computer" on page 137).

- 2 Disconnect any attached devices from the computer and from their electrical outlets.
- 3 Remove any installed batteries (see "Battery Performance" on page 47).
- 4 Moisten a soft, lint-free cloth with water, and wipe it gently across the surface of the touch pad. Do not allow water from the cloth to seep between the touch pad and the surrounding palm rest.

Mouse



NOTICE: Disconnect the mouse from the computer before cleaning the mouse

If your screen cursor skips or moves abnormally, clean the mouse.

Cleaning a Non-Optical Mouse

- 1 Clean the outside casing of the mouse with a cloth moistened with a mild cleaning solution.
- 2 Turn the retainer ring on the underside of your mouse counterclockwise, and then remove the ball.
- 3 Wipe the ball with a clean, lint-free cloth.
- 4 Blow carefully into the ball cage or use a can of compressed air to dislodge dust and lint.
- 5 If the rollers inside the ball cage are dirty, clean the rollers with a cotton swab moistened lightly with isopropyl alcohol.
- 6 Recenter the rollers in their channels if they are misaligned. Ensure that fluff from the swab is not left on the rollers.
- 7 Replace the ball and retainer ring, and turn the retainer ring clockwise until it clicks into place.

Cleaning an Optical Mouse

Clean the outside casing of the mouse with a cloth moistened with a mild cleaning solution.

Media



NOTICE: Always use compressed air to clean the lens in the optical drive, and follow the instructions that come with the compressed air product. Never touch the lens in the drive.

If you notice problems, such as skipping, with the playback quality of your media, try cleaning the discs.

- 1 Hold the disc by its outer edge. You can also touch the inside edge of the center hole.



NOTICE: To help prevent damage to the surface, do not wipe in a circular motion around the disc.

- 2 With a soft, lint-free cloth, gently wipe the bottom of the disc (the unlabeled side) in a straight line from the center to the outer edge of the disc.

For stubborn dirt, try using water or a diluted solution of water and mild soap. You can also purchase commercial products that clean discs and provide some protection from dust, fingerprints, and scratches. Cleaning products for CDs are also safe to use on DVDs.

Dell Technical Support Policy (U.S. Only)

Technician assisted technical support requires the cooperation and participation of the customer in the troubleshooting process and provides for restoration of the operating system, software programs, and hardware drivers to the original default configuration as shipped from Dell, as well as the verification of appropriate functionality of the computer and all Dell-installed hardware. In addition to this technician assisted technical support, online technical support is available at support.dell.com. Additional technical support options may be available for purchase.

Dell provides limited technical support for the computer and any "Dell-installed" software and peripherals¹. Support for third-party software and peripherals is provided by the original manufacturer, including those purchased and/or installed through Dell Software and Peripherals, Readyware, and Custom Factory Integration².

¹ Repair services are provided pursuant to the terms and conditions of your limited warranty and any optional support service contract purchased with the computer.

² All Dell-standard components included in a Custom Factory Integration (CFI) project are covered by the standard Dell limited warranty for your computer. However, Dell also extends a parts replacement program to cover all nonstandard, third-party hardware components integrated through CFI for the duration of the computer's service contract.

Definition of "Dell-Installed" Software and Peripherals

Dell-installed software includes the operating system and some of the software programs that are installed on the computer during the manufacturing process (Microsoft Office, Norton Antivirus, etc).

Dell-installed peripherals include any internal expansion cards, or Dell-branded module bay or ExpressCard accessories. In addition, any Dell-branded monitors, keyboards, mice, speakers, microphones for telephonic modems, docking stations/port replicators, networking products, and all associated cabling are included.

Definition of "Third-Party" Software and Peripherals

Third-party software and peripherals include any peripheral, accessory, or software program sold by Dell not under the Dell brand (printers, scanners, cameras, games, etc). Support for all third-party software and peripherals is provided by the original manufacturer of the product.

FCC Notice (U.S. Only)

FCC Class B

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- This device may not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.



NOTICE: The FCC regulations provide that changes or modifications not expressly approved by Dell Inc. could void your authority to operate this equipment.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does

cause harmful interference with radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the system with respect to the receiver.
- Move the system away from the receiver.
- Plug the system into a different outlet so that the system and the receiver are on different branch circuits.

If necessary, consult a representative of Dell Inc. or an experienced radio/television technician for additional suggestions.

The following information is provided on the device or devices covered in this document in compliance with the FCC regulations:

Product name:	Dell™ Vostro™ 1500
Model number:	PP22L
Company name:	Dell Inc. Worldwide Regulatory Compliance & Environmental Affairs One Dell Way Round Rock, TX 78682 USA 512-338-4400

Macrovision Product Notice

This product incorporates copyright protection technology that is protected by U.S. patents and other intellectual property rights. Use of this copyright protection technology must be authorized by Macrovision, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision. Reverse engineering or disassembly is prohibited.

Glossary

Terms in this Glossary are provided for informational purposes only and may or may not describe features included with your particular computer.

A

AC — alternating current — The form of electricity that powers your computer when you plug the AC adapter power cable in to an electrical outlet.

ACPI — advanced configuration and power interface — A power management specification that enables Microsoft® Windows® operating systems to put a computer in standby or hibernate mode to conserve the amount of electrical power allocated to each device attached to the computer.

AGP — accelerated graphics port — A dedicated graphics port that allows system memory to be used for video-related tasks. AGP delivers a smooth, true-color video image because of the faster interface between the video circuitry and the computer memory.

AHCI — Advanced Host Controller Interface — An interface for a SATA hard drive Host Controller which allows the storage driver to enable technologies such as Native Command Queuing (NCQ) and hot plug.

ALS — ambient light sensor — A feature that helps to control display brightness.

antivirus software — A program designed to identify, quarantine, and/or delete viruses from your computer.

ASF — alert standards format — A standard to define a mechanism for reporting hardware and software alerts to a management console. ASF is designed to be platform- and operating system-independent.

B

battery life span — The length of time (years) during which a portable computer battery is able to be depleted and recharged.

battery operating time — The length of time (minutes or hours) that a portable computer battery powers the computer.

BIOS — basic input/output system — A program (or utility) that serves as an interface between the computer hardware and the operating system. Unless you understand what effect these settings have on the computer, do not change them. Also referred to as *system setup*.

bit — The smallest unit of data interpreted by your computer.

Bluetooth® wireless technology — A wireless technology standard for short-range (9 m [29 feet]) networking devices that allows for enabled devices to automatically recognize each other.

boot sequence — Specifies the order of the devices from which the computer attempts to boot.

bootable CD — A CD that you can use to start your computer. In case your hard drive is damaged or your computer has a virus, ensure that you always have a bootable CD or floppy disk available. Your *Drivers and Utilities* media is a bootable CD.

bootable disk — A disk that you can use to start your computer. In case your hard drive is damaged or your computer has a virus, ensure that you always have a bootable CD or floppy disk available.

bps — bits per second — The standard unit for measuring data transmission speed.

BTU — British thermal unit — A measurement of heat output.

bus — A communication pathway between the components in your computer.

bus speed — The speed, given in MHz, that indicates how fast a bus can transfer information.

byte — The basic data unit used by your computer. A byte is usually equal to 8 bits.

C

C — Celsius — A temperature measurement scale where 0° is the freezing point and 100° is the boiling point of water.

cache — A special high-speed storage mechanism which can be either a reserved section of main memory or an independent high-speed storage device. The cache enhances the efficiency of many processor operations.

L1 cache — Primary cache stored inside the processor.

L2 cache — Secondary cache which can either be external to the processor or incorporated into the processor architecture.

carnet — An international customs document that facilitates temporary imports into foreign countries. Also known as a *merchandise passport*.

CD-R — CD recordable — A recordable version of a CD. Data can be recorded only

once onto a CD-R. Once recorded, the data cannot be erased or written over.

CD-RW — CD rewritable — A rewritable version of a CD. Data can be written to a CD-RW disc, and then erased and written over (rewritten).

CD-RW drive — A drive that can read CDs and write to CD-RW (rewritable CDs) and CD-R (recordable CDs) discs. You can write to CD-RW discs multiple times, but you can write to CD-R discs only once.

CD-RW/DVD drive — A drive, sometimes referred to as a combo drive, that can read CDs and DVDs and write to CD-RW (rewritable CDs) and CD-R (recordable CDs) discs. You can write to CD-RW discs multiple times, but you can write to CD-R discs only once.

clock speed — The speed, given in MHz, that indicates how fast computer components that are connected to the system bus operate.

CMOS — A type of electronic circuit. Computers use a small amount of battery-powered CMOS memory to hold date, time, and system setup options.

COA — Certificate of Authenticity — The Windows alpha-numeric code located on a sticker on your computer. Also referred to as the *Product Key* or *Product ID*.

Consumer IR — A port that allows you to transfer data between the computer and infrared-compatible devices without using a cable connection.

Control Panel — A Windows utility that allows you to modify operating system and hardware settings, such as display settings.

controller — A chip that controls the transfer of data between the processor and memory or between the processor and devices.

CRIMM — continuity rambus in-line memory module — A special module that has no memory chips and is used to fill unused RIMM slots.

cursor — The marker on a display or screen that shows where the next keyboard, touch pad, or mouse action will occur. It often is a blinking solid line, an underline character, or a small arrow.

D

DDR SDRAM — double-data-rate SDRAM — A type of SDRAM that doubles the data burst cycle, improving system performance.

DDR2 SDRAM — double-data-rate 2 SDRAM — A type of DDR SDRAM that uses a 4-bit prefetch and other architectural changes to boost memory speed to over 400 MHz.

device — Hardware such as a disk drive, printer, or keyboard that is installed in or

connected to your computer.

device driver — See *driver*.

DIMM — dual in-line memory module — A circuit board with memory chips that connects to a memory module on the system board.

DIN connector — A round, six-pin connector that conforms to DIN (Deutsche Industrie-Norm) standards; it is typically used to connect PS/2 keyboard or mouse cable connectors.

disk striping — A technique for spreading data over multiple disk drives. Disk striping can speed up operations that retrieve data from disk storage. Computers that use disk striping generally allow the user to select the data unit size or stripe width.

DMA — direct memory access — A channel that allows certain types of data transfer between RAM and a device to bypass the processor.

DMTF — Distributed Management Task Force — A consortium of hardware and software companies who develop management standards for distributed desktop, network, enterprise, and Internet environments.

domain — A group of computers, programs, and devices on a network that are administered as a unit with common rules and procedures for use by a specific group of users. A user logs on to the domain to gain access to the resources.

DRAM — dynamic random-access memory — Memory that stores information in integrated circuits containing capacitors.

driver — Software that allows the operating system to control a device such as a printer. Many devices do not work properly if the correct driver is not installed in the computer.

DSL — Digital Subscriber Line — A technology that provides a constant, high-speed Internet connection through an analog telephone line.

dual-core — An Intel® technology in which two physical computational units exist inside a single processor package, thereby increasing computing efficiency and multi-tasking ability.

dual display mode — A display setting that allows you to use a second monitor as an extension of your display. Also referred to as *extended display mode*.

DVD-R — DVD recordable — A recordable version of a DVD. Data can be recorded only once onto a DVD-R. Once recorded, the data cannot be erased or written over.

DVD+RW — DVD rewritable — A rewritable version of a DVD. Data can be written to a DVD+RW disc, and then erased and written over (rewritten). (DVD+RW technology is different from DVD-RW technology.)

DVD+RW drive — drive that can read DVDs and most CD media and write to DVD+RW (rewritable DVDs) discs.

DVI — digital video interface — A standard for digital transmission between a computer and a digital video display.

E

ECC — error checking and correction — A type of memory that includes special circuitry for testing the accuracy of data as it passes in and out of memory.

ECP — extended capabilities port — A parallel connector design that provides improved bidirectional data transmission. Similar to EPP, ECP uses direct memory access to transfer data and often improves performance.

EIDE — enhanced integrated device electronics — An improved version of the IDE interface for hard drives and CD drives.

EMI — electromagnetic interference — Electrical interference caused by electromagnetic radiation.

ENERGY STAR® — Environmental Protection Agency requirements that decrease the overall consumption of electricity.

EPP — enhanced parallel port — A parallel connector design that provides bidirectional data transmission.

ESD — electrostatic discharge — A rapid discharge of static electricity. ESD can damage integrated circuits found in computer and communications equipment.

expansion card — A circuit board that installs in an expansion slot on the system board in some computers, expanding the capabilities of the computer. Examples include video, modem, and sound cards.

expansion slot — A connector on the system board (in some computers) where you insert an expansion card, connecting it to the system bus.

ExpressCard — A removable I/O card adhering to the PCMCIA standard. Modems and network adapters are common types of ExpressCards. ExpressCards support both the PCI Express and USB 2.0 standard.

Express Service Code — A numeric code located on a sticker on your Dell™ computer. Use the Express Service Code when contacting Dell for assistance. Express Service Code service may not be available in some countries.

extended display mode — A display setting that allows you to use a second monitor as an extension of your display. Also referred to as *dual display mode*.

extended PC Card — A PC Card that extends beyond the edge of the PC Card slot when installed.

F

Fahrenheit — A temperature measurement scale where 32° is the freezing point and 212° is the boiling point of water.

FBD — fully-buffered DIMM — A DIMM with DDR2 DRAM chips and an Advanced Memory Buffer (AMB) that speeds communication between the DDR2 SDRAM chips and the system.

FCC — Federal Communications Commission — A U.S. agency responsible for enforcing communications-related regulations that state how much radiation computers and other electronic equipment can emit.

fingerprint reader — A strip sensor that uses your unique fingerprint to authenticate your user identity to help secure your computer.

folder — A term used to describe space on a disk or drive where files are organized and grouped. Files in a folder can be viewed and ordered in various ways, such as alphabetically, by date, and by size.

format — The process that prepares a drive or disk for file storage. When a drive or disk is formatted, the existing information on it is lost.

FSB — front side bus — The data path and physical interface between the processor and RAM.

FTP — file transfer protocol — A standard Internet protocol used to exchange files between computers connected to the Internet.

G

G — gravity — A measurement of weight and force.

GB — gigabyte — A measurement of data storage that equals 1024 MB (1,073,741,824 bytes). When used to refer to hard drive storage, the term is often rounded to 1,000,000,000 bytes.

GHz — gigahertz — A measurement of frequency that equals one thousand million Hz, or one thousand MHz. The speeds for computer processors, buses, and interfaces are often measured in GHz.

graphics mode — A video mode that can be defined as *x* horizontal pixels by *y* vertical pixels by *z* colors. Graphics modes can display an unlimited variety of shapes and fonts.

GUI — graphical user interface — Software that interacts with the user by means of menus, windows, and icons. Most programs that operate on the Windows operating systems are GUIs.

H

hard drive — A drive that reads and writes data on a hard disk. The terms hard drive and hard disk are often used interchangeably.

heat sink — A metal plate on some processors that helps dissipate heat.

hibernate mode — A power management mode that saves everything in memory to a reserved space on the hard drive and then turns off the computer. When you restart the computer, the memory information that was saved to the hard drive is automatically restored.

HTTP — hypertext transfer protocol — A protocol for exchanging files between computers connected to the Internet.

Hyper-Threading — Hyper-Threading is an Intel technology that can enhance overall computer performance by allowing one physical processor to function as two logical processors, capable of performing certain tasks simultaneously.

Hz — hertz — A unit of frequency measurement that equals 1 cycle per second. Computers and electronic devices are often measured in kilohertz (kHz), megahertz (MHz), gigahertz (GHz), or terahertz (THz).

I

IC — integrated circuit — A semiconductor wafer, or chip, on which thousands or millions of tiny electronic components are fabricated for use in computer, audio, and video equipment.

IDE — integrated device electronics — An interface for mass storage devices in which the controller is integrated into the hard drive or CD drive.

IEEE 1394 — Institute of Electrical and Electronics Engineers, Inc. — A high-performance serial bus used to connect IEEE 1394-compatible devices, such as digital cameras and DVD players, to the computer.

infrared sensor — A port that allows you to transfer data between the computer and infrared-compatible devices without using a cable connection.

integrated — Usually refers to components that are physically located on the computer's system board. Also referred to as *built-in*.

I/O — input/output — An operation or device that enters and extracts data from your computer. Keyboards and printers are I/O devices.

I/O address — An address in RAM that is associated with a specific device (such as a serial connector, parallel connector, or expansion slot) and allows the processor to communicate with that device.

IrDA — Infrared Data Association — The organization that creates international

standards for infrared communications.

IRQ — interrupt request — An electronic pathway assigned to a specific device so that the device can communicate with the processor. Each device connection must be assigned an **IRQ**. Although two devices can share the same **IRQ** assignment, you cannot operate both devices simultaneously.

ISP — Internet service provider — A company that allows you to access its host server to connect directly to the Internet, send and receive e-mail, and access websites. The ISP typically provides you with a software package, user name, and access phone numbers for a fee.

K

Kb — kilobit — A unit of data that equals 1024 bits. A measurement of the capacity of memory integrated circuits.

KB — kilobyte — A unit of data that equals 1024 bytes but is often referred to as 1000 bytes.

key combination — A command requiring you to press multiple keys at the same time.

kHz — kilohertz — A measurement of frequency that equals 1000 Hz.

L

LAN — local area network — A computer network covering a small area. A LAN usually is confined to a building or a few nearby buildings. A LAN can be connected to another LAN over any distance through telephone lines and radio waves to form a wide area network (WAN).

LCD — liquid crystal display — The technology used by portable computer and flat-panel displays.

LED — light-emitting diode — An electronic component that emits light to indicate the status of the computer.

local bus — A data bus that provides a fast throughput for devices to the processor.

LPT — line print terminal — The designation for a parallel connection to a printer or other parallel device.

M

Mb — megabit — A measurement of memory chip capacity that equals 1024 Kb.

Mbps — megabits per second — One million bits per second. This measurement is typically used for transmission speeds for networks and modems.

MB — megabyte — A measurement of data storage that equals 1,048,576 bytes. 1 MB equals 1024 KB. When used to refer to hard drive storage, the term is often rounded to 1,000,000 bytes.

MB/sec — megabytes per second — One million bytes per second. This measurement is typically used for data transfer ratings.

media bay — A bay that supports devices such as optical drives, a second battery, or a Dell TravelLite™ module.

memory — A temporary data storage area inside your computer. Because the data in memory is not permanent, it is recommended that you frequently save your files while you are working on them, and always save your files before you shut down the computer. Your computer can contain several different forms of memory, such as RAM, ROM, and video memory. Frequently, the word memory is used as a synonym for RAM.

memory address — A specific location where data is temporarily stored in RAM.

memory mapping — The process by which the computer assigns memory addresses to physical locations at start-up. Devices and software can then identify information that the processor can access.

memory module — A small circuit board containing memory chips, which connects to the system board.

MHz — megahertz — A measure of frequency that equals 1 million cycles per second. The speeds for computer processors, buses, and interfaces are often measured in MHz.

Mini PCI — A standard for integrated peripheral devices with an emphasis on communications such as modems and NICs. A Mini PCI card is a small external card that is functionally equivalent to a standard PCI expansion card.

Mini-Card — A small card designed for integrated peripherals, such as communication NICs. The Mini-Card is functionally equivalent to a standard PCI expansion card.

Mobile Broadband network — (also known as a WWAN) is a series of interconnected computers that communicate with each other through wireless cellular technology and provides Internet access in the same varied locations from which cellular telephone service is available. Your computer can maintain the Mobile Broadband network connection regardless of its physical location, as long as the computer remains in the service area of your cellular service provider.

modem — A device that allows your computer to communicate with other computers over analog telephone lines. Three types of modems include: external, PC Card, and internal. You typically use your modem to connect to the Internet and exchange e-mail.

module bay — See *media bay*.

MP — megapixel — A measure of image resolution used for digital cameras.

ms — millisecond — A measure of time that equals one thousandth of a second. Access times of storage devices are often measured in ms.

N

network adapter — A chip that provides network capabilities. A computer may include a network adapter on its system board, or it may contain a PC Card with an adapter on it. A network adapter is also referred to as a *NIC* (network interface controller).

NIC — See *network adapter*.

notification area — The section of the Windows taskbar that contains icons for providing quick access to programs and computer functions, such as the clock, volume control, and print status. Also referred to as *system tray*.

ns — nanosecond — A measure of time that equals one billionth of a second.

NVRAM — nonvolatile random access memory — A type of memory that stores data when the computer is turned off or loses its external power source. NVRAM is used for maintaining computer configuration information such as date, time, and other system setup options that you can set.

O

optical drive — A drive that uses optical technology to read or write data from CDs, DVDs, or DVD+RWs. Example of optical drives include CD drives, DVD drives, CD-RW drives, and CD-RW/DVD combo drives.

P

parallel connector — An I/O port often used to connect a parallel printer to your computer. Also referred to as an *LPT port*.

partition — A physical storage area on a hard drive that is assigned to one or more logical storage areas known as logical drives. Each partition can contain multiple logical drives.

PC Card — A removable I/O card adhering to the PCMCIA standard. Modems and

network adapters are common types of PC Cards.

PCI — peripheral component interconnect — PCI is a local bus that supports 32- and 64-bit data paths, providing a high-speed data path between the processor and devices such as video, drives, and networks.

PCI Express — A modification to the PCI interface that boosts the data transfer rate between the processor and the devices attached to it. PCI Express can transfer data at speeds from 250 MB/sec to 4 GB/sec. If the PCI Express chip set and the device are capable of different speeds, they will operate at the slower speed.

PCMCIA — Personal Computer Memory Card International Association — The organization that establishes standards for PC Cards.

PIO — programmed input/output — A method of transferring data between two devices through the processor as part of the data path.

pixel — A single point on a display screen. Pixels are arranged in rows and columns to create an image. A video resolution, such as 800 x 600, is expressed as the number of pixels across by the number of pixels up and down.

Plug-and-Play — The ability of the computer to automatically configure devices. Plug and Play provides automatic installation, configuration, and compatibility with existing hardware if the BIOS, operating system, and all devices are Plug and Play compliant.

POST — power-on self-test — Diagnostics programs, loaded automatically by the BIOS, that perform basic tests on the major computer components, such as memory, hard drives, and video. If no problems are detected during POST, the computer continues the start-up.

processor — A computer chip that interprets and executes program instructions. Sometimes the processor is referred to as the CPU (central processing unit).

PS/2 — personal system/2 — A type of connector for attaching a PS/2-compatible keyboard, mouse, or keypad.

PXE — pre-boot execution environment — A WfM (Wired for Management) standard that allows networked computers that do not have an operating system to be configured and started remotely.

R

RAID — redundant array of independent disks — A method of providing data redundancy. Some common implementations of RAID include RAID 0, RAID 1, RAID 5, RAID 10, and RAID 50.

RAM — random-access memory — The primary temporary storage area for program instructions and data. Any information stored in RAM is lost when you shut down your

computer.

readme file — A text file included with a software package or hardware product. Typically, readme files provide installation information and describe new product enhancements or corrections that have not yet been documented.

read-only — Data and/or files you can view but cannot edit or delete. A file can have read-only status if:

- It resides on a physically write-protected floppy disk, CD, or DVD.
- It is located on a network in a directory and the system administrator has assigned rights only to specific individuals.

refresh rate — The frequency, measured in Hz, at which your screen's horizontal lines are recharged (sometimes also referred to as its *vertical frequency*). The higher the refresh rate, the less video flicker can be seen by the human eye.

resolution — The sharpness and clarity of an image produced by a printer or displayed on a monitor. The higher the resolution, the sharper the image.

RFI — radio frequency interference — Interference that is generated at typical radio frequencies, in the range of 10 kHz to 100,000 MHz. Radio frequencies are at the lower end of the electromagnetic frequency spectrum and are more likely to have interference than the higher frequency radiations, such as infrared and light.

ROM — read-only memory — Memory that stores data and programs that cannot be deleted or written to by the computer. ROM, unlike RAM, retains its contents after you shut down your computer. Some programs essential to the operation of your computer reside in ROM.

RPM — revolutions per minute — The number of rotations that occur per minute. Hard drive speed is often measured in rpm.

RTC — real time clock — Battery-powered clock on the system board that keeps the date and time after you shut down the computer.

RTCST — real-time clock reset — A jumper on the system board of some computers that can often be used for troubleshooting problems.

S

SAS — serial attached SCSI — A faster, serial version of the SCSI interface (as opposed to the original SCSI parallel architecture).

SATA — serial ATA — A faster, serial version of the ATA (IDE) interface.

ScanDisk — A Microsoft utility that checks files, folders, and the hard disk's surface for errors. ScanDisk often runs when you restart the computer after it has stopped responding.

SCSI — small computer system interface — A high-speed interface used to connect devices to a computer, such as hard drives, CD drives, printers, and scanners. The SCSI can connect many devices using a single controller. Each device is accessed by an individual identification number on the SCSI controller bus.

SDRAM — synchronous dynamic random-access memory — A type of DRAM that is synchronized with the optimal clock speed of the processor.

serial connector — An I/O port often used to connect devices such as a handheld digital device or digital camera to your computer.

Service Tag — A bar code label on your computer that identifies your computer when you access Dell Support at support.dell.com or when you call Dell for customer service or technical support.

setup program — A program that is used to install and configure hardware and software. The **setup.exe** or **install.exe** program comes with most Windows software packages. *Setup program* differs from *system setup*.

shortcut — An icon that provides quick access to frequently used programs, files, folders, and drives. When you place a shortcut on your Windows desktop and double-click the icon, you can open its corresponding folder or file without having to find it first. Shortcut icons do not change the location of files. If you delete a shortcut, the original file is not affected. Also, you can rename a shortcut icon.

SIM — Subscriber Identity Module — A SIM card contains a microchip that encrypts voice and data transmissions. SIM cards can be used in phones or portable computers.

smart card — A card that is embedded with a processor and a memory chip. Smart cards can be used to authenticate a user on computers equipped for smart cards.

S/PDIF — Sony/Philips Digital Interface — An audio transfer file format that allows the transfer of audio from one file to another without converting it to and from an analog format, which could degrade the quality of the file.

standby mode — A power management mode that shuts down all unnecessary computer operations to save energy.

Strike Zone™ — Reinforced area of the platform base that protects the hard drive by acting as a dampening device when a computer experiences resonating shock or is dropped (whether the computer is on or off).

surge protectors — Prevent voltage spikes, such as those that may occur during an electrical storm, from entering the computer through the electrical outlet. Surge protectors do not protect against lightning strikes or against brownouts, which occur when the voltage drops more than 20 percent below the normal AC-line voltage level.

Network connections cannot be protected by surge protectors. Always disconnect the network cable from the network connector during electrical storms.

SVGA — super-video graphics array — A video standard for video cards and controllers. Typical SVGA resolutions are 800 x 600 and 1024 x 768.

The number of colors and resolution that a program displays depends on the capabilities of the monitor, the video controller and its drivers, and the amount of video memory installed in the computer.

S-video TV-out — A connector used to attach a TV or digital audio device to the computer.

SXGA — super-extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1280 x 1024.

SXGA+ — super-extended graphics array plus — A video standard for video cards and controllers that supports resolutions up to 1400 x 1050.

system board — The main circuit board in your computer. Also known as the *motherboard*.

system setup — A utility that serves as an interface between the computer hardware and the operating system. System setup allows you to configure user-selectable options in the BIOS, such as date and time or system password. Unless you understand what effect the settings have on the computer, do not change the settings for this program.

T

TAPI — telephony application programming interface — Enables Windows programs to operate with a wide variety of telephony devices, including voice, data, fax, and video.

text editor — A program used to create and edit files that contain only text; for example, Windows Notepad uses a text editor. Text editors do not usually provide word wrap or formatting functionality (the option to underline, change fonts, and so on).

TPM — trusted platform module — A hardware-based security feature that when combined with security software enhances network and computer security by enabling features such as file and e-mail protection.

travel module — A plastic device designed to fit inside the module bay of a portable computer to reduce the weight of the computer.

U

UAC — user account control— Microsoft Windows® Vista™ security feature that, when enabled, provides an added layer of security between user accounts and access to operating system settings.

UMA — unified memory allocation — System memory dynamically allocated to video.

UPS — uninterruptible power supply — A backup power source used when the electrical power fails or drops to an unacceptable voltage level. A UPS keeps a computer running for a limited amount of time when there is no electrical power. UPS systems typically provide surge suppression and may also provide voltage regulation. Small UPS systems provide battery power for a few minutes to enable you to shut down your computer.

USB — universal serial bus — A hardware interface for a low-speed device such as a USB-compatible keyboard, mouse, joystick, scanner, set of speakers, printer, broadband devices (DSL and cable modems), imaging devices, or storage devices. Devices are plugged directly in to a 4-pin socket on your computer or in to a multi-port hub that plugs in to your computer. USB devices can be connected and disconnected while the computer is turned on, and they can also be daisy-chained together.

UTP — unshielded twisted pair — Describes a type of cable used in most telephone networks and some computer networks. Pairs of unshielded wires are twisted to protect against electromagnetic interference, rather than relying on a metal sheath around each pair of wires to protect against interference.

UXGA — ultra extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1600 x 1200.

V

video controller — The circuitry on a video card or on the system board (in computers with an integrated video controller) that provides the video capabilities—in combination with the monitor—for your computer.

video memory — Memory that consists of memory chips dedicated to video functions. Video memory is usually faster than system memory. The amount of video memory installed primarily influences the number of colors that a program can display.

video mode — A mode that describes how text and graphics are displayed on a monitor. Graphics-based software, such as Windows operating systems, displays in video modes that can be defined as *x* horizontal pixels by *y* vertical pixels by *z* colors. Character-based software, such as text editors, displays in video modes that can be defined as *x* columns by *y* rows of characters.

video resolution — See *resolution*.

virus — A program that is designed to inconvenience you or to destroy data stored on your computer. A virus program moves from one computer to another through an infected disk, software downloaded from the Internet, or e-mail attachments. When an infected program starts, its embedded virus also starts.

A common type of virus is a boot virus, which is stored in the boot sectors of a floppy disk. If the floppy disk is left in the drive when the computer is shut down and then turned on, the computer is infected when it reads the boot sectors of the floppy disk expecting to find the operating system. If the computer is infected, the boot virus may replicate itself onto all the floppy disks that are read or written in that computer until the virus is eradicated.

V — volt — The measurement of electric potential or electromotive force. One V appears across a resistance of 1 ohm when a current of 1 ampere flows through that resistance.

W

W — watt — The measurement of electrical power. One W is 1 ampere of current flowing at 1 volt.

WHr — watt-hour — A unit of measure commonly used to indicate the approximate capacity of a battery. For example, a 66-WHr battery can supply 66 W of power for 1 hour or 33 W for 2 hours.

wallpaper — The background pattern or picture on the Windows desktop. Change your wallpaper through the Windows Control Panel. You can also scan in your favorite picture and make it wallpaper.

WLAN — wireless local area network. A series of interconnected computers that communicate with each other over the air waves using access points or wireless routers to provide Internet access.

write-protected — Files or media that cannot be changed. Use write-protection when you want to protect data from being changed or destroyed. To write-protect a 3.5-inch floppy disk, slide its write-protect tab to the open position.

WPAN — wireless personal area network. A computer network used for communication among computer devices (including telephones and personal digital assistants) close to one person.

WWAN — wireless wide area network. A wireless high-speed data network using cellular technology and covering a much larger geographic area than WLAN.

WXGA — wide-aspect extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1280 x 800."

X

XGA — extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1024 x 768.

Z

ZIF — zero insertion force — A type of socket or connector that allows a computer chip to be installed or removed with no stress applied to either the chip or its socket.

Zip — A popular data compression format. Files that have been compressed with the Zip format are called Zip files and usually have a filename extension of **.zip**. A special kind of zipped file is a self-extracting file, which has a filename extension of **.exe**. You can unzip a self-extracting file by double-clicking it.

Zip drive — A high-capacity floppy drive developed by Iomega Corporation that uses 3.5-inch removable disks called Zip disks. Zip disks are slightly larger than regular floppy disks, about twice as thick, and hold up to 100 MB of data.

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