Dell™ Dimension™ 4700C Service Manual

Model DHP

Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

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Troubleshooting Tools

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Power Lights

The power button light located on the front of your computer illuminates and blinks or remains solid to indicate different states:

- If the power light is green and the computer is not responding, see "Diagnostic Lights."
- If the power light is blinking green, the computer is in standby mode. Press a key on the keyboard, press the power button, or move the mouse to resume normal operation.
- If the power light is off, the computer is either turned off or is not receiving power.
  - Reseat the power cable into both the power connector on the back of the computer and the electrical outlet.
  - If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and that the power strip is turned on. Also bypass power protection devices, power strips, and power extension cables to verify that the computer turns on properly.
  - Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
  - Ensure that the main power cable and front panel cable are securely connected to the system board.
- If the power light is blinking amber, the computer is receiving electrical power, but an internal power problem might exist.
  - Ensure that the voltage selection switch is set to match the AC power at your location (if applicable). See your *Owners Manual* for more information.
  - Ensure that the processor power cable is securely connected to the system board. See your *Owners Manual* for more information.
- If the power light is steady amber, a device might be malfunctioning or incorrectly installed.
  - Remove and then reinstall the memory modules.
  - Remove and then reinstall any cards.
  - Remove and then reinstall the graphics card, if applicable.
- Eliminate sources of interference. Some possible causes of interference are:
  - Power, keyboard, and mouse extension cables
  - Too many devices on a power strip
  - Multiple power strips connected to the same electrical outlet

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Network Lights

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

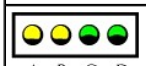
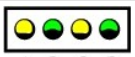
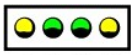
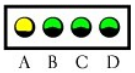
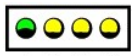
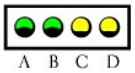
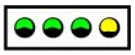
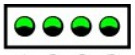
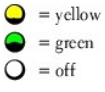
- Check the network cable connector to ensure that the network cable is firmly inserted into both the network connector on the back of the computer and the network jack.
- Check the network lights on the back of the computer. If the link integrity light is off, that indicates no network communication exists. Replace the network cable. For a description of network lights, see your *Owner's Manual*.
- Restart the computer and log on to the network again.
- Check your network settings. Contact your network administrator or the person who set up your network to verify that your network settings are correct and that the network is functioning.
- Run the Hardware Troubleshooter. See your *Owner's Manual*.

Diagnostic Lights

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

To help you troubleshoot a problem, your computer has four lights labeled "A," "B," "C," and "D" on the back panel (see your *Owner's Manual*). The lights can be yellow or green. When the computer starts normally, the lights flash. After the computer starts, all four lights display solid green. If the computer

malfunctions, the color and sequence of the lights identify the problem.

Light Pattern	Problem Description	Suggested Resolution
	The computer is in a normal "off" condition or a possible pre-BIOS failure has occurred.	Plug the computer into a working electrical outlet and press the power button.
	A possible processor failure has occurred.	Contact Dell (see your *Owner's Manual*).
	Memory modules are detected, but a memory failure has occurred.	• If you have two or more memory modules installed, remove the modules, reinstall one module (see your *Owner's Manual*), and then restart the computer. If the computer starts normally, reinstall an additional module. Continue until you have identified a faulty module or reinstalled all modules without error. • If available, install properly working memory of the same type into your computer (see your *Owner's Manual*). • If the problem persists, contact Dell (see your *Owner's Manual*).
	A possible graphics card failure has occurred.	• If the computer has a graphics card, remove the card, reinstall it (see your *Owner's Manual*), and then restart the computer. • If the problem still exists, install a graphics card that you know works and restart the computer. • If the problem persists or the computer has integrated graphics, contact Dell (see your *Owner's Manual*).
	A possible floppy or hard drive failure has occurred.	Reseat all power and data cables and restart the computer.
	A possible USB failure has occurred.	Reinstall all USB devices, check cable connections, and then restart the computer.
	No memory modules are detected.	• If you have two or more memory modules installed, remove the modules, reinstall one module (see your *Owner's Manual*), and then restart the computer. If the computer starts normally, reinstall an additional module. Continue until you have identified a faulty module or reinstalled all modules without error. • If available, install properly working memory of the same type into your computer (see your *Owner's Manual*). • If the problem persists, contact Dell (see your *Owner's Manual*).
	Memory modules are detected, but a memory configuration or compatibility error exists.	• Ensure that no special memory module/memory connector placement requirements exist (see your *Owner's Manual*). • Verify that the memory modules that you are installing are compatible with your computer (see your *Owner's Manual*). • If the problem persists, contact Dell (see your *Owner's Manual*).
	A possible expansion card failure has occurred.	1. Determine if a conflict exists by removing a card (not a graphics card) (see your *Owner's Manual*) and restarting the computer. 2. If the problem persists, reinstall the card that you removed, remove a different card, and then restart the computer. 3. Repeat this process for each card. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts (see your *Owner's Manual*). 4. If the problem persists, contact Dell (see your *Owner's Manual*).
	Another failure has occurred.	• Ensure that the cables are properly connected to the system board from the hard drive, CD drive, and DVD drive (see your *Owner's Manual*). • If there is an error message on your screen identifying a problem with a device (such as the floppy drive or hard drive), check the device to make sure it is functioning properly. • The operating system is attempting to boot from a device (such as the floppy drive or hard drive); check system setup (see your *Owner's Manual*) to make sure the boot sequence is correct for the devices installed on your computer. • If the problem persists, contact Dell (see your *Owner's Manual*).
	The computer is in a normal operating condition after POST.	None.
		

Beep Codes

Your computer might emit a series of beeps during start-up if the monitor cannot display errors or problems. This series of beeps, called a beep code, identifies a problem. One possible beep code (code 1-3-1) consists of one beep, a burst of three beeps, and then one beep. This beep code tells you that the computer encountered a memory problem.

Reseating the memory modules may fix the beep code errors listed in the following table. If the problem persists, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.

Code	Cause
1-3-1 through 2-4-4	Memory not being properly identified or used
4-3-1	Memory failure above address 0FFFFh

If you hear one of the beep codes listed in the following table, see "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.

Code	Cause
1-1-2	Microprocessor register failure
1-1-3	NVRAM
1-1-4	ROM BIOS checksum failure
1-2-1	Programmable interval timer
1-2-2	DMA initialization failure
1-2-3	DMA page register read/write failure
3-1-1	Slave DMA register failure
3-1-2	Master DMA register failure
3-1-3	Master interrupt mask register failure
3-1-4	Slave interrupt mask register failure
3-2-2	Interrupt vector loading failure
3-2-4	Keyboard Controller Test failure
3-3-1	NVRAM power loss
3-3-2	NVRAM configuration
3-3-4	Video Memory Test failure
3-4-1	Screen initialization failure
3-4-2	Screen retrace failure
3-4-3	Search for video ROM failure
4-2-1	No timer tick
4-2-2	Shutdown failure
4-2-3	Gate A20 failure
4-2-4	Unexpected interrupt in protected mode
4-3-3	Timer-chip counter 2 failure
4-3-4	Time-of-day clock stopped
4-4-1	Serial or parallel port test failure
4-4-4	Cache test failure

System Messages

NOTE: If the message you received is not listed in the following table, see the documentation for either the operating system or the program that was running when the message appeared.

Message	Possible Cause	Corrective Action
`8042 Gate-A20 error`	The keyboard controller failed its test.	If you receive this message after you make changes in the system setup program, enter the system setup program and restore the original value.
`Address Line Short!`	An error in the address decoding circuitry in the memory has occurred.	Reseat the memory modules.

`C: Drive Error`
 	
`C: Drive Failure`
	The hard drive is not working or is not configured correctly.	Ensure that the drive is installed correctly in the computer and defined correctly in the system setup program.

`Cache Memory`	The cache memory is not	See "Contacting Dell" in your *Owner's*

Bad, Do Not Enable Cache	operating.	*Manual* for instructions on obtaining technical assistance.
CH-2 Timer Error	An error is occurring on the timer on the system board.	See "Contacting Dell" in your *Owner's Manual* for instructions on obtaining technical assistance.
CMOS Battery State Low CMOS Checksum Failure CMOS System Options Not Set CMOS Display Type Mismatch CMOS Memory Size Mismatch CMOS Time and Date Not Set	The system configuration information in the system setup program is incorrect or the battery charge may be low.	Enter the system setup program, verify the system configuration, and then restart the computer. If the battery charge is low, replace the battery. (See "Battery" in your *Owner's Manual*.)
CPU Fan failure	The fan has stopped spinning or is spinning too slowly.	Check the fan to see if anything is stopping or slowing it down.
Previous Fan Failure	The fan stopped spinning or is spinning too slowly. This event happened sometime during normal operation before the last boot.	Check the fan to see if anything is stopping or slowing it down.
Diskette Boot Failure	Drive A or B is present but has failed the BIOS POST.	Ensure that the drive is installed correctly in the computer and defined correctly in the system setup program. Check the interface cable at both ends.
DMA Error DMA 1 Error DMA 2 Error	An error occurred in the DMA controller on the system board.	The keyboard or system board may need to be replaced.
FDD Controller Failure HDD Controller Failure	The BIOS cannot communicate with the floppy drive or hard drive controller.	Ensure that the floppy drive or the hard drive is installed correctly in the computer and defined correctly in the system setup program. Check the interface cable at both ends.
INTR1 Error INTR2 Error	An interrupt channel on the system board failed to POST.	The keyboard or system board may need to be replaced.
Invalid Boot Diskette	The operating system cannot be located on drive A or drive C.	Enter the system setup program and confirm that drive A or drive C is properly identified.
Keyboard Error	The BIOS has detected a stuck key.	Ensure that nothing is resting on the keyboard; if a key appears to be stuck, carefully pry it up. If the problem persists, you may need to replace the keyboard.
KB/Interface Error	An error occurred with the keyboard connector.	Ensure that nothing is resting on the keyboard; if a key appears to be stuck, carefully pry it up. If the problem persists, you may need to replace the keyboard.
No ROM Basic	The operating system cannot be located on drive A or drive C.	Enter the system setup program and confirm that drive A or drive C is properly identified.

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Before You Begin

Dell™ Dimension™ 4700C Service Manual

This document provides procedures for removing and installing the components in your computer. Unless otherwise noted, each procedure assumes that the following conditions exist:

- You have performed the steps in "Turning Off Your Computer" and "Before Working Inside Your Computer."
- You have read the safety information in your Dell™ *Product Information Guide*.
- A component can be replaced or—if purchased separately—installed by performing the removal procedure in reverse order.

Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- Phillips #0 and #2 screwdrivers
- Phillips #1 screwdriver

Turning Off Your Computer

NOTICE: To avoid losing data, save and close any open files and exit any open programs before you turn off your computer.

1. Shut down the operating system:
   a. Save and close any open files, exit any open programs, click the **Start** button, and then click **Turn Off Computer**.
   b. In the **Turn off computer** window, click **Turn off**.

   The computer turns off after the operating system shutdown process finishes.
2. Ensure that the computer and any attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for 4 seconds.

Before Working Inside Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to help ensure your own personal safety.

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

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

NOTICE: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

NOTICE: When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

NOTICE: To avoid damaging the computer, perform the following steps before you begin working inside the computer.

1. Turn off your computer.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

2. Disconnect any telephone or network cables from the computer.
3. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.

4. Remove the computer stand, if it is attached.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

5. Open the computer cover.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

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Opening the Computer Cover

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

1. Shut down the computer through the Start menu.
2. Ensure that your computer and attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, turn them off now.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

3. Disconnect any telephone or telecommunication lines from the computer.
4. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.
5. Remove the computer stand, if it is attached.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

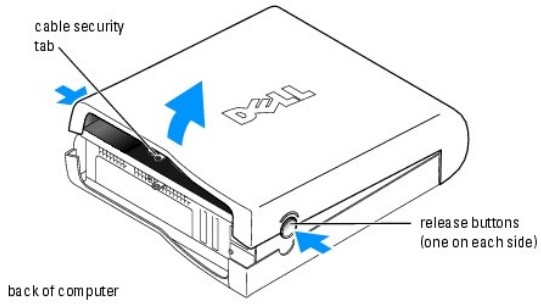
NOTICE: Ensure that there is sufficient space to support the open cover—at least 30 cm (1 ft) of desk top space.

6. Locate the *two* release buttons shown in the illustration. Then press the *two* release buttons as you lift the cover.

NOTICE: Open the cover slowly to ensure that you do not damage any cables.

7. Raise the back of the cover, and pivot it toward the front of the computer.

NOTE: Make sure that the computer is oriented with the cable security tab on top, as shown in the illustration.



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Removing and Installing Parts

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Reattaching the Front Door

To prevent damage to your computer, the front door is designed to "break away" if it is opened too far. To reattach the front door:

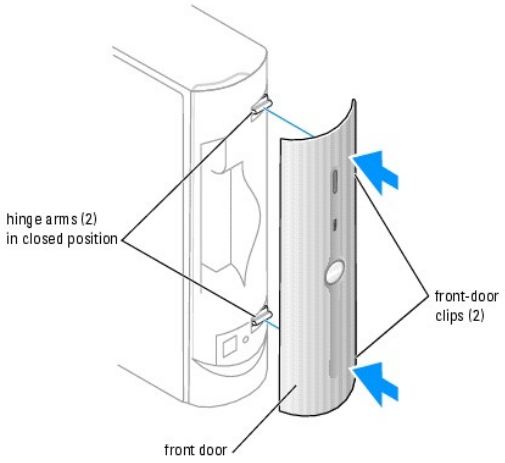
1. Shut down the computer through the **Start** menu.
2. Ensure that your computer and attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, turn them off now.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

3. Disconnect any telephone or telecommunication lines from the computer.
4. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.

NOTE: The top hinge arm clicks when it is moved to the closed position—the bottom hinge arm does not.

5. Move the hinge arms to the closed position.
6. Align the two clips on the inside of the front door with the two hinge arms.
7. Press inward on the front door until it clips to both hinge arms.



Memory

You can increase your computer memory by installing memory modules on the system board.

Your computer supports DDR2 memory. For additional information on the type of memory supported by your computer, see the memory specifications.

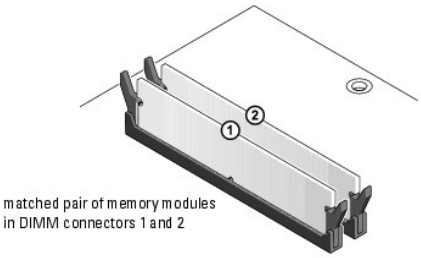
DDR2 Memory Overview

If you are installing two DDR2 memory modules, you should install the modules as a pair, *with matched memory size and speed*. If the DDR2 memory modules are not installed in a matched pair, the computer will continue to operate, but with a slight reduction in performance. If you install a mixed pair of DDR2 400-MHz (PC2-3200) and DDR2 533-MHz (PC2-4300) memory, the modules function at the slowest speed installed. See the label on the module to determine the module's capacity.

NOTE: Always install DDR2 memory modules in the order indicated on the system board.

NOTICE: Do not install ECC memory modules.

The recommended memory configuration is a pair of matched memory modules installed in DIMM connectors 1 and 2.



matched pair of memory modules
in DIMM connectors 1 and 2

NOTE: Memory purchased from Dell is covered under your computer warranty.

NOTICE: If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules that you may have, even if you purchased the new modules from Dell. If possible, *do not* pair an original memory module with a new memory module. Otherwise, your computer may not start properly. You should install your original memory modules as a pair in DIMM connectors 1 and 2.

Addressing Memory With 4-GB Configurations

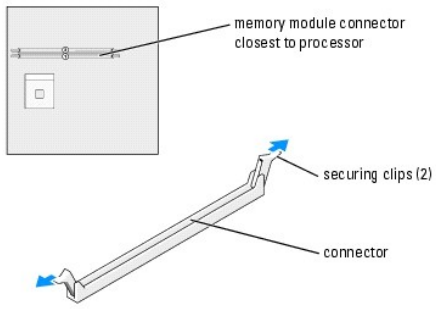
Your computer supports a maximum of 4 GB of memory when you use two 2-GB DIMMs. Current operating systems, such as Microsoft® Windows® XP, can only use a maximum of 4 GB of address space; however, the amount of memory available to the operating system is less than 4 GB. Certain components within the computer require address space in the 4-GB range. Any address space reserved for these components cannot be used by computer memory.

Installing Memory

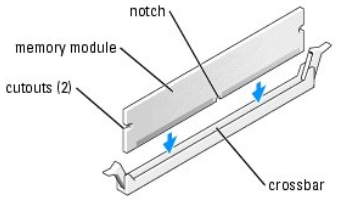
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "Before You Begin."
2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
3. Press out the securing clip at each end of the memory module connector.



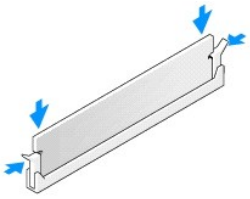
4. Align the notch on the bottom of the module with the crossbar in the connector.



NOTICE: To avoid damage to the memory module, press the module straight down into the connector while you apply equal force to each end of the module.

5. Insert the module into the connector until the module snaps into position.

   If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.



6. Close the computer cover.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.
8. Right-click the **My Computer** icon and click **Properties**.
9. Click the **General** tab.
10. To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

Removing Memory

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

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "Before You Begin."
2. Press out the securing clip at each end of the memory module connector.
3. Grasp the module and pull up.

   If the module is difficult to remove, gently ease the module back and forth to remove it from the connector.

Cards

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

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

Your Dell™ computer provides the following slots for PCI Express cards:

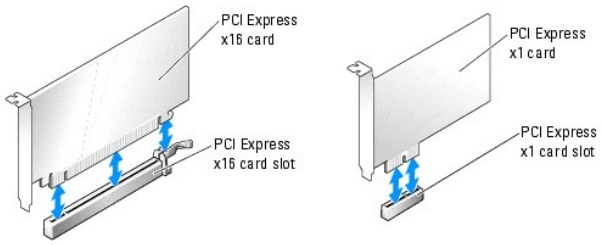
- One PCI Express x16 card slot

- One PCI Express x1 card slot

NOTE: The slots for the PCI Express x16 and PCI Express x1 cards are half-height slots.

PCI Express Cards

Your computer supports one PCI Express x16 card and one PCI Express x1 card.

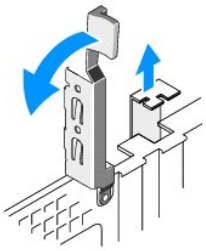


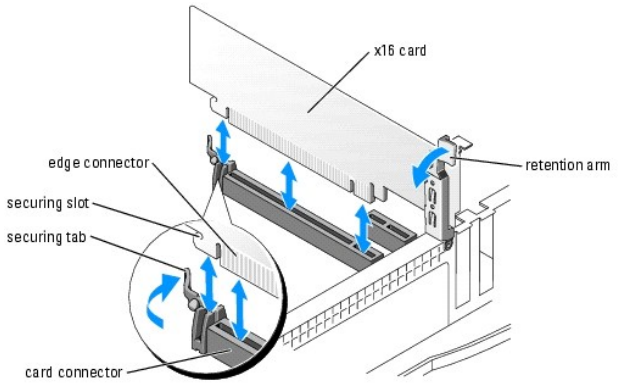
If you are installing or replacing a PCI Express card, follow the procedures in the next section. If you are removing but not replacing a card, see "Removing a PCI Express Card."

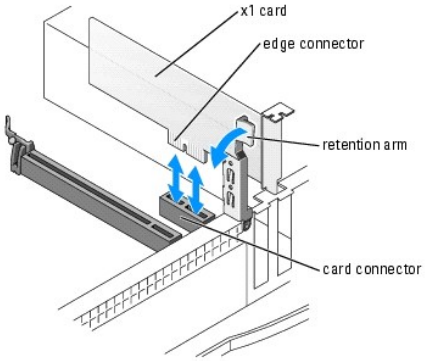
If you are replacing a card, remove the current driver for the card from the operating system.

Installing a PCI Express Card

1. Follow the procedures in "Before You Begin."
2. If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 4.







3. If you are replacing a card that is already installed in the computer, remove the card.

   If necessary, disconnect any cables connected to the card. Gently pull the securing tab, grasp the card by its top corners, and then ease it out of its connector.

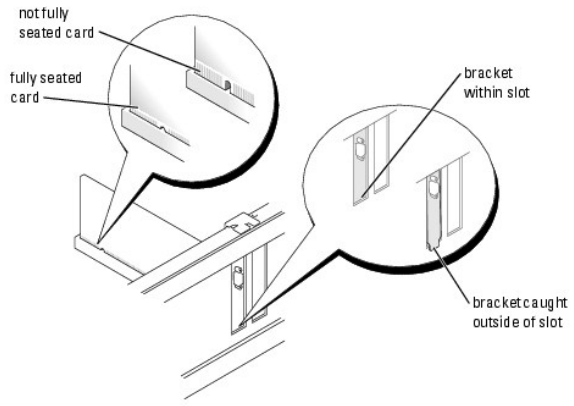
4. Prepare the card for installation.

   See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

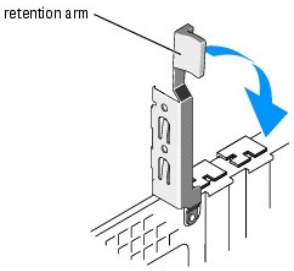
⚠ **CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.**

5. If you are installing the card into the x16 card connector, position the card so the securing slot is aligned with the securing tab, and gently pull the securing tab.

6. Place the card in the connector and press down firmly. Ensure that the card is fully seated in the slot.



7. Ensure that:
   - The tops of all cards and filler brackets are flush with the alignment bar.
   - The notch in the top of the card or filler bracket fits around the alignment guide.
8. Secure the card(s) in the computer.



NOTICE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

9. Connect any cables that should be attached to the card.

   See the documentation that came with the card for information about the card's cable connections.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

10. Close the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.
11. Install any drivers required for the card as described in the card documentation.

Removing a PCI Express Card

1. Follow the procedures in "Before You Begin."
2. If necessary, disconnect any cables connected to the card.
3. Gently pull back the securing tab, grasp the card by its top corners, and then ease it out of its connector.
4. If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

   If you need a filler bracket, see "Contacting Dell" in your *Owner's Manual*.

NOTE: Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

5. Close the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.
6. Remove the card's driver from the operating system.

Flash Card Reader

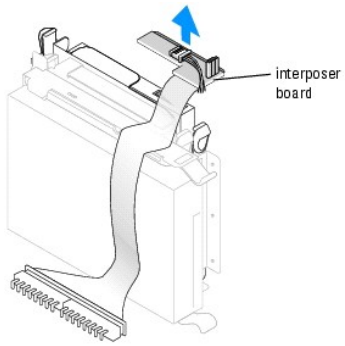
For information on using the Flash Card Reader, see "Using a Flash Card Reader" in your *Owner's Manual*.

Removing a Flash Card Reader

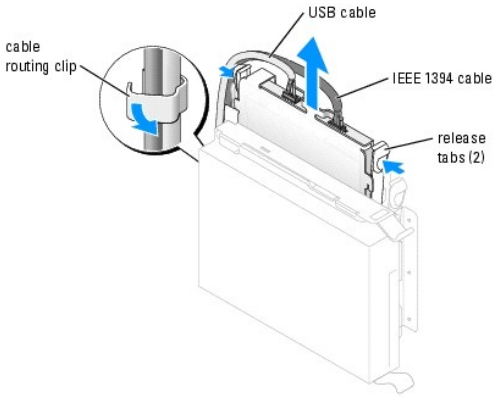
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "Before You Begin."



2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
3. Open the computer cover.
4. Disconnect the flex cable assembly from the back of the CD drive.
5. Disconnect the USB cable on the back of the Flash Card Reader from the front-panel USB connector on the system board.



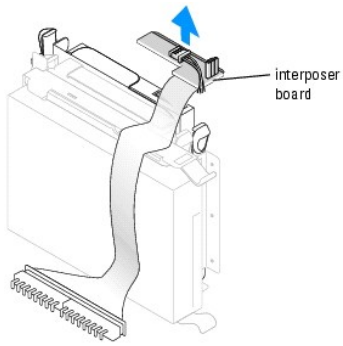
6. Disconnect the IEEE 1394 connector on the system board.
7. Release the cable from the cable routing clip.
8. Press in on the release tabs at each end of the media bracket and slide the unit out.
9. Reconnect the flex cable assembly to the back of the CD drive.
10. Close the computer cover.

Installing a Flash Card Reader

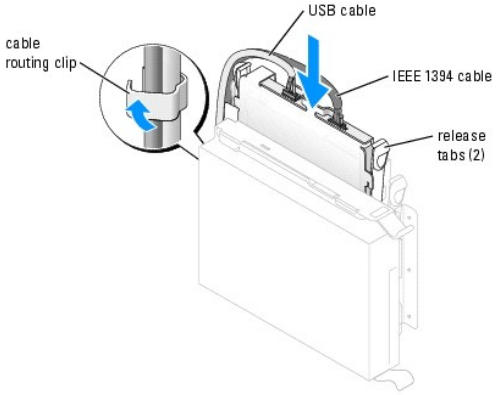
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "Before You Begin."



2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
3. Open the computer cover.
4. Disconnect the flex cable assembly from the back of the CD drive.
5. Remove the Flash Card Reader and bracket from its packaging.
6. Make sure the USB cable and IEEE 1394 cable are connected to the back of the media drive.



7. Press in on the release tabs at each end of the media bracket and slide the unit until it clicks in place.
8. Connect the USB cable on the back of the Flash Card Reader to the front-panel USB connector on the system board.
9. Connect the IEEE 1394 cable on the back of the Flash Card Reader to the front-panel IEEE 1394 connector on the system board.
10. Route the USB cable and the IEEE 1394 cable through the cable routing clip.
11. Reconnect the flex cable assembly to the back of the CD drive.
12. Close the computer cover.

Processor

Removing the Processor

NOTICE: Do not perform the following steps unless you are familiar with hardware removal and replacement. Performing these steps incorrectly could damage your system board. For technical service, see "Contacting Dell" in the *Owner's Manual*.

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

1. Follow the procedures in "Before You Begin."

2. Open the computer cover.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

3. Disconnect the cooling fan power cable from the FAN connector on the system board.

4. Disconnect the power cable from the 12VPOWER connector on the system board.

CAUTION: The heat sink assembly can get very hot during normal operation. Be sure that the assembly has had sufficient time to cool before you touch it.

5. If you are replacing the heat sink only, remove the two screws on the blower to remove it from the heat sink.

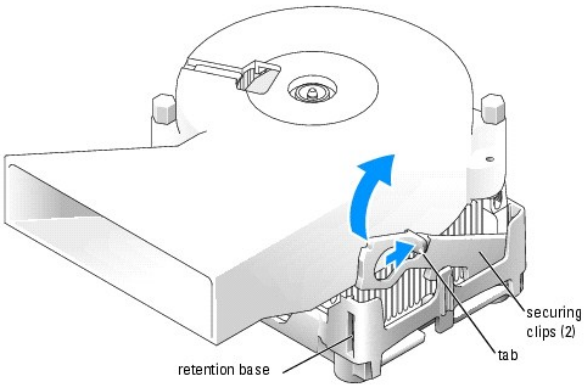
NOTICE: If you are installing a processor upgrade kit from Dell, discard the original heat sink. If you are *not* installing a processor upgrade kit from Dell, reuse the original heat sink when you install your new processor.

6. Remove the heat-sink/blower assembly:

   a. Press the tab on the securing clip to remove the clip from the retention base.

NOTICE: Remove only one securing clip from the retention.

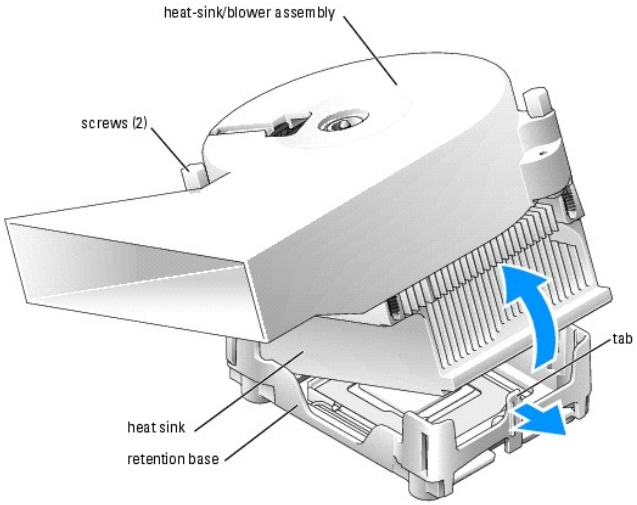
NOTE: Your computer's heat sink may differ in appearance than illustrated below, but it is removed and reinstalled in the same manner.



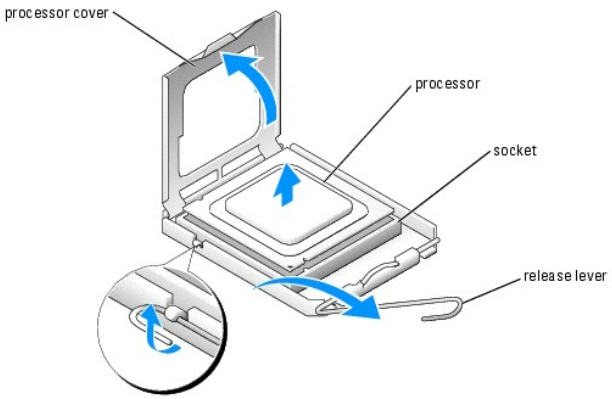
   b. Remove the heat sink by pressing the tab while lifting one end of the heat sink.

NOTICE: Lay the heat sink down with the thermal material facing upward.

NOTE: Your computer's heat sink may differ in appearance than illustrated below, but it is removed and reinstalled in the same manner.



7. Open the processor cover.



NOTICE: Carefully remove the processor from the socket to avoid permanent damage to the processor.

8. To remove the processor from the socket, lift the processor vertically in one motion.

   Leave the release lever extended in the release position so that the socket is ready for the new processor.

Installing the Processor

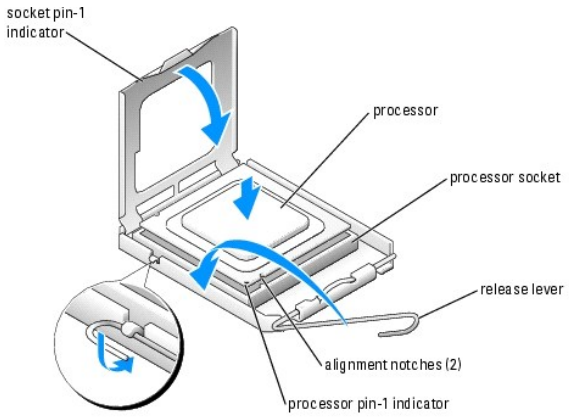
NOTICE: Ground yourself by touching an unpainted metal surface on the back of the computer.

1. Unpack the new processor.

NOTICE: You must position the processor correctly in the socket to avoid permanent damage to the processor and the computer when you turn on the computer.

2. If the release lever on the socket is not fully extended, move it to that position.

3. Align the pin-1 corners of the processor and socket.



NOTICE: Socket pins are delicate. To avoid damage, ensure that the processor is aligned properly with the socket, and do not use excessive force when you install the process. Be careful not to touch or bend the pins on the system board.

4. Set the processor lightly in the socket and ensure that the processor is level in the socket. When the processor is positioned correctly, press it with minimal pressure to seat it.
5. When the processor is fully seated in the socket, close the processor cover.
6. Pivot the socket release lever back toward the socket and snap it into place to secure the processor.

NOTICE: If you are *not* installing a processor upgrade kit from Dell, reuse the original heat-sink assembly when you replace the processor.

If you installed a processor replacement kit from Dell, return the original heat-sink assembly and processor to Dell in the same package in which your replacement kit was sent.

7. If you are replacing the heat sink only, reinstall the two screws that attach the blower to the heat sink.
8. Install the heat-sink/blower assembly:
   a. Place the one end of the heat-sink assembly under the tab on one side of the retention base.
   b. Lower the assembly until the heat sink fits securely under the tab on the retention base.
   c. Insert the securing clip by placing the notched end of the clip opposite the tab into the slot on the retention base. Press on the securing clip tab and lower the securing clip into place. Make sure that the notched ends of the securing clip are secured in the retention base slots.
9. Plug the fan cable into the FAN connector on the system board.
10. Plug the power cable into the 12VPOWER connector on the system board.
11. Close the computer cover.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

12. Connect your computer and devices to electrical outlets, and turn them on.

Modem

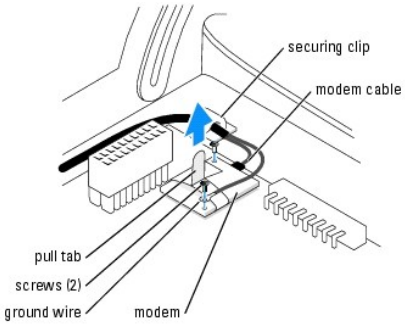
Replacing the Modem

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

NOTICE: Before you remove or install the modem, make sure to disconnect all telephone and network cables from your computer.

1. Follow the procedures in "Before You Begin."

2. Open the computer cover



3. Remove the existing modem:
    a. Disconnect the modem cable from the modem.
    b. Use a size #1 screwdriver to remove the screws securing the modem and ground wire to the system board, and set the screws aside.
    c. Move the ground wire out of the way.
    d. Pull straight up on the attached pull-tab to lift the modem out of its connector on the system board, and disconnect the modem cable.

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

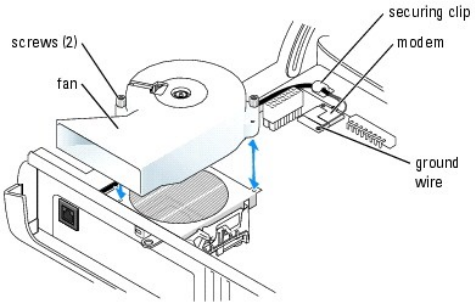
4. Install the new modem:
    a. Align the modem with the screw holes and press the modem into the connector on the system board.
    b. Replace the ground wire.
    c. Use a size #1 screwdriver to install the screws that secure the modem and ground wire to the system board.
    d. Connect the modem cable to the modem.
5. Close the computer cover.

Replacing the Modem Cable and External Modem Connector

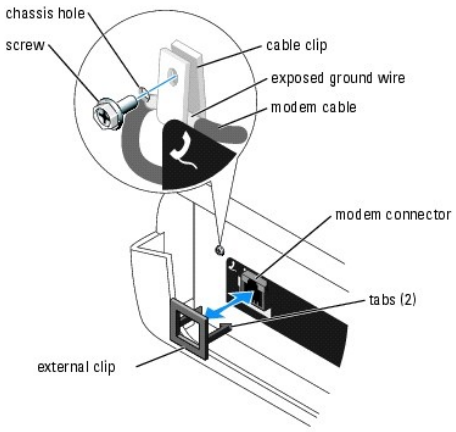
CAUTION: Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: Before you remove or install the modem, make sure to disconnect all telephone and network cables from your computer.

1. Follow the procedures in "Before You Begin."
2. Open the computer cover.
3. Remove the modem cable and ground wire from the modem:
    a. Disconnect the modem cable from the modem.
    b. Remove the screw that secures the ground wire to the modem and system board and set the screw aside.
    c. Remove the cable and ground wire from the securing clip that is located next to the modem.



4. Remove the external modem connector:
    a. Remove the two screws from the fan and lift the fan up and out of the way.
    b. Remove the screw from the cable clip located by the external modem connector.



    c. To release the modem connector, gently open the tabs on each side of the external clip that holds the external modem connector in place.
    d. Lift the modem cable and connector from the computer.

5. To install a new modem cable and external modem connector:
    a. Align the external connector with the slot on the back on the computer.
    b. Press on each side of the external clip and secure the external modem connector in place.
    c. Push on the back of the modem connector to make sure that the external clip completely engages and fits tightly against the back of the computer.
    d. Place the modem cable and ground wire in the cable clip and secure the clip to the computer chassis with the screw.
    e. Carefully route the cable and ground wire around the processor making sure that you keep the wires away from any internal parts.

6. Attach the modem cable and ground wire to the modem:
    a. Connect the modem cable to the modem.
    b. Replace the screw that secures the ground wire to the modem and system board.

7. Align the fan with the holes on the heat sink and replace the two screws.

8. Close the computer cover.

Power Supply

Removing the Power Supply

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

1. Shut down the computer through the **Start** menu.

2. Ensure that your computer and attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, turn them off now.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

3. Follow the procedures in "Before You Begin."

4. Disconnect any telephone or telecommunication lines from the computer.

5. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.

6. Remove the computer stand, if it is attached.

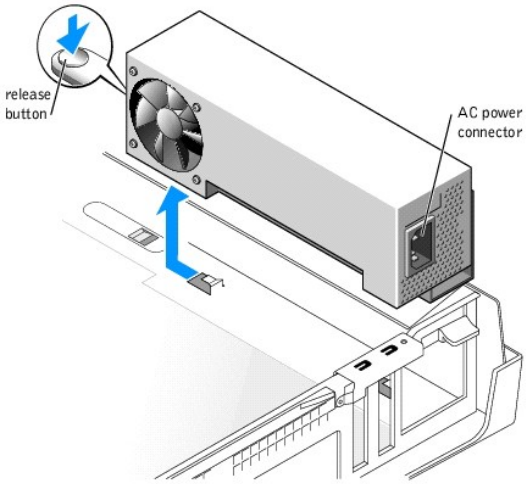
CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

7. Disconnect the AC power cable from the power supply connector.
8. Open the computer cover.
9. Disconnect the DC power cables from the system board and the drives.

   Note the routing of the DC power cables underneath the tabs in the computer frame as you remove them from the system board and drives. You must route these cables properly when you replace them to prevent their being pinched or crimped.

10. Press the release button located on the floor of the computer frame.



11. Slide the power supply approximately 1 inch toward the front of the computer.
12. Lift the power supply up and out of the computer.

Replacing the Power Supply

1. Slide the power supply into place.
2. Run the cables underneath the clips, and press the clips to close them over the cables.
3. Reconnect the DC power cables
4. Close the computer cover.
5. Connect the AC power cable to the power supply connector.
6. Attach the computer stand (optional).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.

System Board

Removing the System Board

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

1. Shut down the computer through the **Start** menu.
2. Ensure that your computer and attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your computer, turn them off now.

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

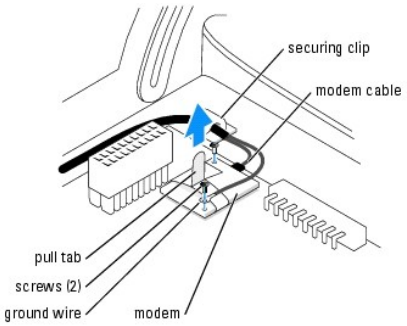
3. Disconnect any telephone or telecommunication lines from the computer.
4. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.
5. Follow the procedures in "Before You Begin."
6. Remove the computer stand, if it is attached.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

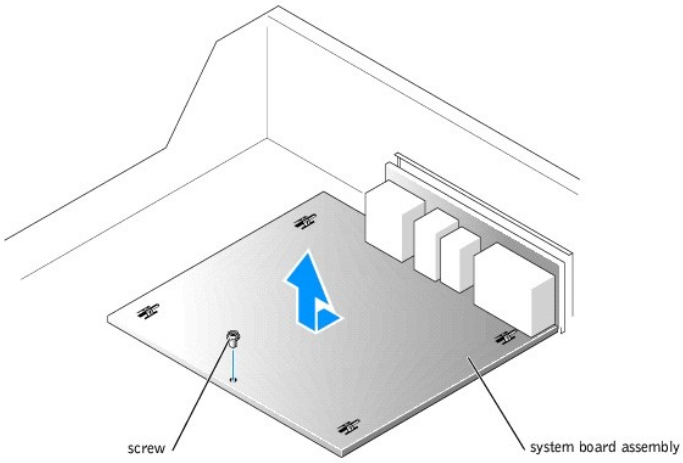
7. Open the computer cover.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

8. Remove the power supply, installed cards, and any components that restrict access to the system board.
9. Disconnect all cables from the system board.
10. Disconnect the modem cable and ground wire from the modem:
    a. Disconnect the modem cable from the modem.
    b. Use a size #1 screwdriver to remove the screws securing the modem and ground wire to the system board, and set the screws aside.



11. Before you remove the existing system board, visually compare the replacement system board to the existing system board to make sure that you have the correct part.
12. Remove the system board:
    a. Remove the screw from the system board toward the front of the computer.
    b. Slide the system board toward the front of the computer to until it stops and then lift the board straight up.



13. Place the system board that you just removed next to the replacement system board.

Replacing the System Board

1. Transfer components from the existing system board to the replacement system board:
   a. Remove the memory modules and install them on the replacement system board.

CAUTION: The heat-sink assembly and processor package can get hot. To avoid burns, ensure that the assembly and package have had sufficient time to cool before you touch them.

   b. Remove the heat-sink assembly and processor package from the existing system board and transfer them to the replacement system board.
   c. Remove the modem from the existing system board and transfer it to the replacement system board.

2. Configure the settings of the replacement system board.

3. Set the jumpers on the replacement system board so that they are identical to the ones on the existing system board.

NOTE: Some components and connectors on the replacement system board may be in different locations from corresponding connectors on the existing system board.

4. Orient the replacement system board by aligning the slots in the bottom of the board to the tabs on the computer.

5. Slide the system board down onto the pins.

6. Replace the screw that holds the system board down.

7. Reconnect the modem cable and ground wire to the modem:
   a. Reconnect the modem cable from the modem.
   b. Use a size #1 screwdriver to remove the screws securing the modem and ground wire to the system board, and set the screws aside.

8. Replace any components and cables that you removed from the system board.

9. Reconnect all cables to their connectors at the back of the computer.

10. Close the computer cover.

11. Attach the computer stand (optional).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

12. Connect your computer and devices to electrical outlets, and turn them on.

Battery

Replacing the Battery

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

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

A coin-cell battery maintains computer configuration, date, and time information. The battery can last several years.

If you have to repeatedly reset time and date information after turning on the computer, replace the battery.

CAUTION: A new battery can explode if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

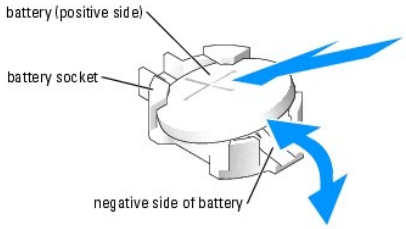
NOTE: For information regarding the type of coin-cell battery, see the power specifications.

To replace the coin-cell battery:

1. Record all the screens in system setup so that you can restore the correct settings in step 8.
2. Follow the procedures in "Before You Begin."
3. Locate the battery socket on the system board.

NOTICE: If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.

4. Remove the system battery:
   a. Support the battery connector by pressing down firmly on the positive side of the connector.
   b. While supporting the battery connector, press the battery toward the positive side of the connector and pry it up out of the securing tabs at the negative side of the connector.



NOTICE: To avoid damage to the battery connector, you must firmly support the connector while installing or removing a battery.

5. Install the new system battery:
   a. Support the battery connector by pressing down firmly on the positive side of the connector.
   b. Hold the battery with the "+" facing up, and slide it under the securing tabs at the positive side of the connector.
   c. Press the battery straight down into the connector until it snaps into place.
6. Close the computer cover.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

7. Connect your computer and devices to electrical outlets, and turn them on.
8. Enter system setup and restore the settings you recorded in step 1.
9. Properly dispose of the old battery. See the *Product Information Guide* for battery disposal information.

Closing the Computer Cover

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

1. Place the computer on a flat surface.
2. Ensure that all cables are connected, and fold cables out of the way.

   Gently pull the power cables toward you so that they do not get caught underneath the drives.
3. Ensure that no tools or extra parts are left inside the computer.
4. Close the cover:
   a. Pivot the cover down.
   b. Press down on the right side of the cover until it closes.
   c. Press down on the left side of the cover until it closes.
   d. Ensure that both sides of the cover are locked. If not, repeat all of step 4.
5. Attach the computer stand (optional).

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

6. Connect your computer and devices to electrical outlets, and turn them on.

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Specifications

Dell™ Dimension™ 4700C Service Manual

Memory	
Type	400-MHz and 533-MHz DDR2 unbuffered SDRAM
Memory connectors	two
Memory capacities	256-MB, 512-MB, 1-GB, or 2-GB non-ECC
Maximum memory	4 GB **NOTE:** See "Addressing Memory With 4-GB Configurations" in your *Owner's Manual* to verify the amount of memory available to the operating system.
BIOS address	F0000h

Computer Information	
Chip set	Intel 915G Express chip set
DMA channels	eight
Interrupt levels	24
BIOS chip (NVRAM)	4Mb
NIC	Integrated network interface capable of 10/100 Mbps communication
System clock	800-MHz data rate

Video	
Type	Intel integrated Graphics Media Accelerator (GMA) 900 x16 PCI Express Discrete Graphics

Audio	
Type	ADI 1980 AC97 Codec

Expansion Bus	
Bus type	PCI Express x1 and x16
Bus speed	PCI Express: x1 slot bidirectional speed: 500 MB/sec x16 slot bidirectional speed: 8 GB/sec
PCI Express:	
connector	one x1
connector size	36 pins
connector data width (maximum)	one PCI Express lane
PCI Express:	
connector	one x16
connector size	164 pins
connector data width (maximum)	16 PCI Express lanes

Drives	
Externally accessible	one slimline 3.5-inch media bay one slimline 5.25-inch drive bay
Available devices	Serial ATA drive, USB memory devices, CD drive, DVD drive, DVD+RW drive, DVD/CD-RW combo drive,

	DVD+/-RW, and Flash Card Reader
Internally accessible	one bay for 1-inch high hard drive

Connectors	
External connectors:	
Serial	9-pin, 16550C-compatible connector
IEEE 1394	one 6-pin powered back-panel connector (not present on all computers) one 6-pin powered front-panel connector (with optional Flash Card Reader)
Video	15-hole D-SUB connector
USB	two front-panel and five back-panel USB 2.0–compliant connectors
Headphone	front-panel miniature connector for line-out
Audio	five connectors for line-in, line-out, microphone, surround, and center/Low Frequency Effects (LFE) channel; S/PDIF back panel connector (S/PDIF connector not present on all computers)
Network adapter	RJ45 connector
Modem	RJ11 (MDC 1.5) connector
System board connectors:	
IDE drive	one 40-pin connector
Serial ATA	one 7-pin connectors
Fan	one 5-pin connectors
PCI Express x1	36-pin connector
PCI Express x16	164-pin connector
USB	8-pin header for optional Flash Card Reader (3.5-inch bay device)
MDC	one 12-pin connector
Front-panel audio	one 10-pin header
Front panel	one 34-pin header
Power	one 2 x 10 connector
Processor power	one 2 x 2 connector
IEEE 1394	one 2 x 5 header for optional Flash Card Reader (3.5-inch bay device)

Controls and Lights	
Power control	push button
Power light	green light — Blinking green in sleep state; solid green for power-on state. amber light — Blinking amber indicates a problem with an installed device; solid amber indicates an internal power problem (see "Power Problems" in your *Dell Dimension Owner's Manual*).
Hard-drive access light	green
Link integrity light (on integrated network adapter)	green light — A good connection exists between a 10-Mbps network and the computer. orange light — A good connection exists between a 100-Mbps network and the computer. off (no light) — The computer is not detecting a physical connection to the network.
Activity light (on integrated network adapter)	yellow blinking light
Diagnostic lights	four lights on the back panel (See "Diagnostic Lights" in your *Dell Dimension Owner's Manual*.)
Standby power light	AUX_PWR on the system board
Activity light (optional Flash Card Reader)	green blinking light

Power	
DC power supply:	
Wattage	160 W 270 W
Heat dissipation	460.7 BTU/hr

Voltage (See the safety instructions in the *Product Information Guide* for important voltage setting information.)	fixed-voltage power supply — 110 V at 50/60 Hz manual selection and auto-sensing power supplies — 90 to 135 V at 50/60 Hz; 180 to 265 V at 50/60 Hz; 100 V at 50/60 Hz for Japanese computers
Backup battery	3-V CR2032 lithium coin cell

Physical	
Height	32.3 cm (12.7 inches)
Width	9.6 cm (3.8 inches)
Depth	35.6 cm (14.0 inches)
Weight	7.4 kg (16.4 lb)

Environmental	
Temperature:	
Operating	10° to 35°C (50° to 95°F) **NOTE:** At 35°C (95°F), the maximum operating altitude is 914 m (3000 ft).
Storage	–40° to 65°C (–40° to 149°F)
Relative humidity	20% to 80% (noncondensing)
Maximum vibration:	
Operating	0.25 G at 3 to 200 Hz at 0.5 octave/min
Storage	0.5 G at 3 to 200 Hz at 1 octave/min
Maximum shock:	
Operating	bottom half-sine pulse with a change in velocity of 50.8 cm/sec (20 inches/sec)
Storage	27-G faired square wave with a velocity change of 508 cm/sec (200 inches/sec)
Altitude:	
Operating	–15.2 to 3048 m (–50 to 10,000 ft)
Storage	–15.2 to 10,668 m (–50 to 35,000 ft)

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Attaching and Removing the Computer Stand

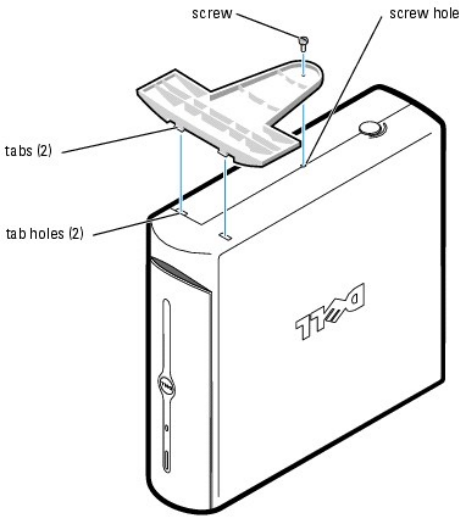
Dell™ Dimension™ 4700C Service Manual

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

NOTE: Place your computer on a soft surface to prevent scratching the top cover.

To attach the stand:

1. Rotate the computer to an upside-down position.
2. Insert the screw into the bottom of the stand.
3. Align the two tabs and the screw on the stand with the tab holes and screw hole in the bottom of the computer.



4. Tighten the screw.
5. Place the computer in the upright position.

To remove the stand:

1. Turn the computer over so that the stand is at the top.
2. Loosen the screw and lift the stand away.

3. Place the computer in a horizontal position until you reattach the stand.

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System Setup

Dell™ Dimension™ 4700C Service Manual

Overview

Use system setup as follows:

- To change the system configuration information after you add, change, or remove any hardware in your computer
- To set or change a user-selectable option such as the user password
- To read the current amount of memory or set the type of hard drive installed

Before you use system setup, it is recommended that you write down the system setup screen information for future reference.

NOTICE: Unless you are an expert computer user, do not change the settings for this program. Certain changes can make your computer work incorrectly.

Entering System Setup

1. Turn on (or restart) your computer.
2. When the blue DELL™ logo appears, press <F2> immediately.

   If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop. Then shut down your computer and try again.

System Setup Screens

The system setup screen displays current or changeable configuration information for your computer. Information on the screen is divided into three areas: the options list, active options field, and key functions.

Options List — This field appears on the left side of the system setup window. The field is a scrollable list containing features that define the configuration of your computer, including installed hardware, power conservation, and security features. Scroll up and down the list with the up- and down-arrow keys. As an option is highlighted, the **Option Field** displays more information about that option and the option's current and available settings. Press <Enter> to expand or contract each of the main option fields.	**Option Field** — This field contains information about each option. In this field you can view your current settings and make changes to your settings. Use the right- and left-arrow keys to highlight an option. Press <Enter> to make that selection active. Key Functions — This field appears below the **Option Field** and lists keys and their functions within the active system setup field.

System Setup Options

NOTE: Depending on your computer and installed devices, the items listed in this section may not appear, or may not appear exactly as listed.

System	
CPU Info	Identifies whether the computer's processor supports Hyper-Threading and lists the processor bus speed, processor ID, clock speed, and L2 cache.
Memory Info	Indicates amount of installed memory, memory speed, channel mode (dual or single), and type of memory installed.
Date/Time	Displays current date and time settings.
Boot Sequence	The computer attempts to boot from the sequence of devices specified in this list. **NOTE:** If you insert a boot device and restart the computer, this option appears in the system setup menu. To boot from a USB memory device, select the USB device and move it so it becomes the first device in the list.

Drives	
Diskette Drive	Identifies and defines the floppy drive attached to the FLOPPY connector on the system board as **Off**, **USB**, **Internal**, or **Read Only**.
Drives 0 through 1	Identifies the drives attached to the SATA or PRI IDE connectors on the system board, and lists the capacity for hard drives.
SATA Operation	Identifies and defines the SATA modes. You can set the SATA controller to **Normal** or **Combo** mode.
Onboard Devices	
NIC Controller	You can set the NIC to **On** (default), **Off**, or **On w/ PXE**. When the **On w/ PXE setting is active** (available only for the future boot process), the computer prompts the user to press <Ctrl><Alt><b>. Pressing this key combination causes a menu to display that allows you to select a method for booting from a network server. If a boot routine is not available from the network server, the computer attempts to boot from the next device in the boot sequence list.
Modem	Enables or disables the onboard modem.
1394 Controller	Enables of disables the IEEE 1394 connections.
Card Reader	Enables or disables the optional Flash Card Reader.
Audio Controller	Enables or disables the onboard audio controller.
USB Controller	Set to **On** (default) so that USB devices will be detected and supported in the operating system. The **No Boot** option enables a USB controller, but does not recognize a USB storage device.
Serial Port	Identifies and defines the serial port settings. **Auto** (default) automatically configures a connector to a particular designation (**COM1** or **COM3**). **NOTE:** If both resources are in use, the port is disabled.
Video	
Primary Video	This setting specifies which video controller is primary when two video controllers are present on the computer.
Video Memory Size	Use this option to select 8 MB (default) or 1 MB of system memory for an integrated video controller.
Performance	
HyperThreading	If your computer's processor supports Hyper-Threading, this option appears in the **Options List**.
HDD Acoustic Mode	- **Bypass** — Your computer does not test or change the current acoustics mode setting. - **Quiet** (default) — The hard drive operates at its most quiet setting. - **Suggested** — The hard drive operates at the level suggested by the drive manufacturer. - **Performance** — The hard drive operates at its maximum speed. **NOTE:** Switching to performance mode may cause the drive to be noisier, but its performance is not affected. **NOTE:** Changing the acoustics setting does not alter your hard drive image.
Security	This section displays available system security options.
Unlock Setup	Use this option with **Admin Password** to unlock setup options. **NOTE:** This option appears only when the **Admin Password** option is enabled.
Admin Password	This option provides restricted access to the computer's system setup program in the same way that access to the system can be restricted with the **System Password** option. **NOTE:** To delete a password, enter the old password and press <Enter> two times.
System Password	Displays the current status of the system's password security feature and allows a new system password to be assigned and verified.
Password Changes	This option locks the system password field with the setup password. When the field is locked, you can no longer disable password security by pressing <Ctrl><Enter> when the computer starts.
Power Management	
AC Recovery	Determines what happens when AC power is restored to the computer.
Auto Power On	Sets the computer to automatically turn on. Choices are **every day** or every **Monday through Friday**. The default setting is **Off**. This feature does not work if you turn off your computer using a power strip or surge protector.
Auto Power Time	Sets time to automatically turn on the computer. Time is kept in a 24-hour format (*hours:minutes*). Change the start-up time by pressing the right- or left-arrow key to increase or decrease the numbers, or type numbers in both the date and time fields. This feature does not work if you turn off your computer using a power strip or surge protector.
Low Power Mode	Use this mode to conserve power.
Suspend Mode	The options are **S1**, a suspend state where the computer is running in a low-power mode, and **S3**, a standby state where the power is reduced or turned off for most components; however, system memory remains active.

Maintenance	
Load Defaults	This setting restores the computer's factory-installed default settings.
Event Log	Displays the system event log.
POST Behavior	
Fastboot	When set to **On** (default), your computer starts more quickly because it skips certain configurations and tests.
Numlock Key	This option involves the rightmost bank of keys on your keyboard. When set to **On** (default), this option activates the numeric and mathematical features shown at the top of each key. When set to **Off**, this option activates the cursor-control functions labeled on the bottom of each key.
POST Hotkeys	This option allows you to specify the function keys to display on the screen when the computer starts.
Keyboard Errors	This option disables or enables keyboard error reporting when the computer starts.

Boot Sequence

This feature allows you to change the boot sequence for devices.

NOTICE: If you modify any boot sequence settings, save the new settings to avoid losing the changes.

Option Settings

- **Diskette Drive** — The computer attempts to boot from the floppy drive. If the floppy disk in the drive is not bootable, if no floppy disk is in the drive, or if there is no floppy drive installed in the computer, the computer generates an error message.
- **Hard Drive** — The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer generates an error message.
- **CD Drive** — The computer attempts to boot from the CD drive. If no CD is in the drive, or if the CD has no operating system, the computer generates an error message.
- **USB Flash Device** — Insert the memory device into a USB port and restart the computer. When F12 = Boot Menu appears in the upper-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB flash option to the boot menu.

NOTE: To boot to a USB device, the device must be bootable. To make sure that your device is bootable, check the device documentation.

Changing Boot Sequence for the Current Boot

You can use this feature, for example, to restart your computer to a USB device such as a floppy drive, or memory key.

1. If you are booting to a USB device, connect the USB device to a USB connector. For more information, see your *Owner's Manual*.
2. Turn on (or restart) your computer.
3. When F2 = Setup, F12 = Boot Menu appears in the upper-right corner of the screen, press <F12>.

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

   The **Boot Device Menu** appears, listing all available boot devices.
4. Select a device and press <Enter>.

   For example, if you are booting to a USB memory key, highlight **USB Flash Device** and press <Enter>.

NOTE: To boot to a USB device, the device must be bootable. To make sure your device is bootable, check the device documentation.

NOTE: You can also change the boot sequence using the Boot Sequence options in the **System Setup Options.**

Changing Boot Sequence for Future Boots

1. Enter system setup.
2. Use the arrow keys to highlight the **Boot Sequence** menu option and press <Enter> to access the menu.

NOTE: Write down your current boot sequence in case you want to restore it.

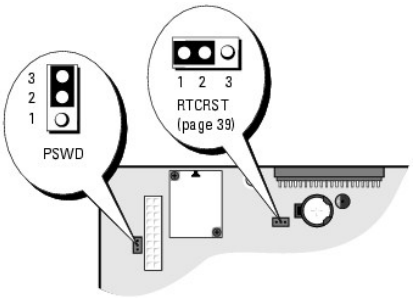
3. Press the up- and down-arrow keys to move through the list of devices.
4. Press the spacebar to enable or disable a device (enabled devices have a checkmark).

5. Press the <u> key or the <d> key to move a selected device up or down the list.

Clearing Forgotten Passwords

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

1. Follow the procedures in "Before You Begin."



2. Locate the 3-pin password jumper (PSWD) on the system board, and attach the jumper plug to pins 1 and 2 to clear the password.

NOTE: When you receive your computer, the jumper plug is attached to pins 2 and 3.

3. Close the computer cover.
4. Connect your computer and monitor to electrical outlets, and turn them on.
5. After the Microsoft® Windows® desktop appears on your computer, shut down the computer.
6. Turn off the monitor and disconnect it from the electrical outlet.
7. Disconnect the computer power cable from the electrical outlet, and press the power button to ground the system board.
8. Open the computer cover.
9. Locate the 3-pin password jumper (PSWD) on the system board and attach the jumper to pins 2 and 3 to re-enable the password feature.
10. Close the computer cover.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

11. Connect your computer and devices to electrical outlets, and turn them on.

Clearing CMOS Settings

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

1. Follow the procedures in "Before You Begin."
2. Reset the current CMOS settings:
   a. Locate the 3-pin CMOS jumper (RTCRST) on the system board.
   b. Remove the jumper plug from pins 1 and 2.
   c. Place the jumper plug on pins 2 and 3 and wait approximately 5 seconds.
   d. Replace the jumper plug on pins 1 and 2.

3. Close the computer cover.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

4. Connect your computer and devices to electrical outlets, and turn them on.

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Inside View of Your Computer

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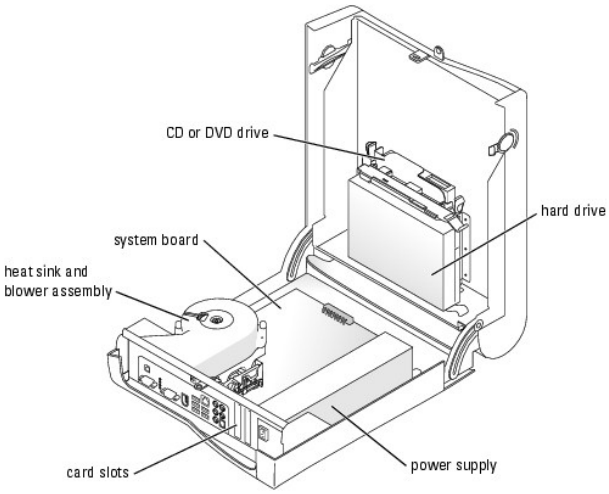
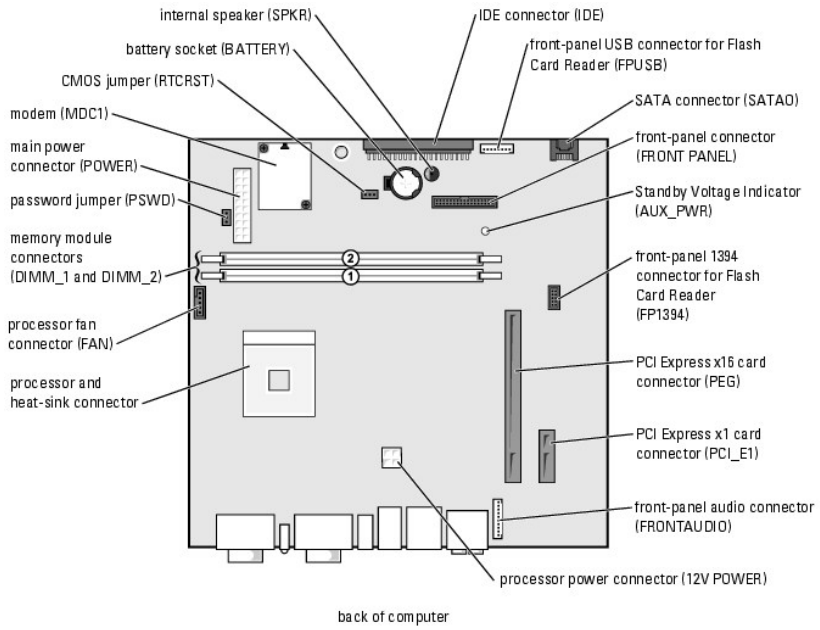
⚠ **CAUTION:** **Before you begin any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.**

⚠ **CAUTION:** **To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.**

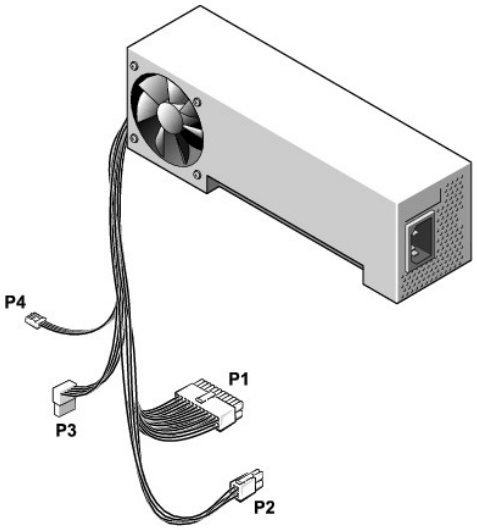
NOTICE: Be careful when opening the computer cover to ensure that you do not inadvertently disconnect cables from the system board.



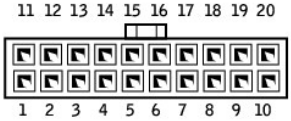
Internal System Board Components



Power Supply DC Connector Pin Assignments



DC Power Connector P1



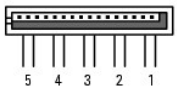
Pin Number	**Signal name**	**18-AWG Wire**

1	+3.3 VDC	Orange
2	+3.3 VDC	Orange
3	GND	Black
4	+5 VDC	Red
5	GND	Black
6	+5 VDC	Red
7	GND	Black
8	POK	Gray
9	+5 VSB	Purple
10	+12 VDC	Yellow
11	+3.3 VDC*	Orange
12	–12 VDC	Blue
13	GND	Black
14	PS ON	Green
15	GND	Black
16	GND	Black
17	GND	Black
18	+5 VDC	N/C
19	+5 VDC	Red
20	+5 VDC	Red
*Sense connector.		

DC Power Connector P2

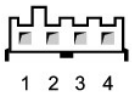
Pin Number	Signal Name	18-AWG Wire
1	GND	Black
2	GND	Black
3	+12 VDC	Yellow
4	+12 VDC	Yellow

DC Power Connector P3



Pin Number	Signal Name	18-AWG Wire
1	+3.3 VDC	Orange
2	GND	Black
3	+5 VDC	Red
4	GND	Black
5	+12 VDC	Yellow

DC Power Connectors P4



Pin Number	Signal Name	22-AWG Wire
1	+5 VCD	Red
2	GND	Black
3	GND	Black
4	+12 VDC	Yellow

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Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

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