

# **Upgrading and Servicing Guide**

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# Upgrading and Servicing Guide

## Safety Information

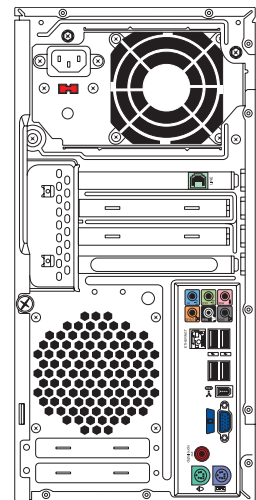
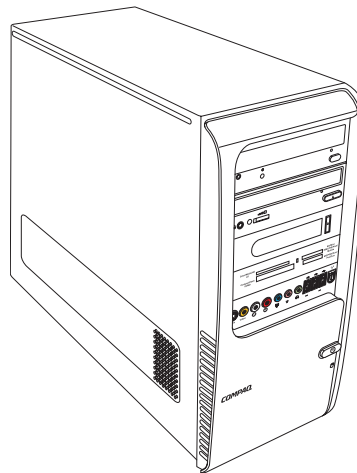
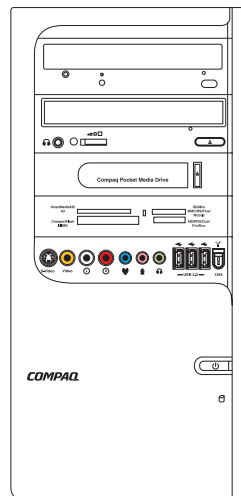
This product has not been evaluated for connection to an "IT" power system (an AC distribution system with no direct connection to the earth, according to IEC 60950).



**WARNING:** Please read "Safety Information" in the *Warranty and Support Guide* before installing and connecting your system to the electrical power system.

The *Upgrading and Servicing Guide* provides instructions on how to remove and replace hardware components of your PC.

## Opening and Closing the PC



## Preparing the PC

Before you upgrade any component in your PC, you need to prepare the PC so that you can safely handle it and the components.

Read the following items before attempting to upgrade or service the PC:

- 1 These procedures assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.
- 2 Write down and save the system model and serial numbers, all installed options, and other information about the system. It's easier to consult this information than to open and examine the PC.
- 3 It is recommended that you use an antistatic wrist strap and a conductive foam pad when working on the system.



**WARNING:** Always disconnect the modem cord from the telephone system, and then disconnect the PC from the power source before removing the front and side panels of the PC. Failure to do so before you open the PC or do any procedures can result in personal injury or equipment damage.

---

## Before Opening the PC

To avoid injury and equipment damage, always follow this procedure in this order before opening the PC:

- 1 Remove any diskette or optical disc (CD or DVD) from the PC.
- 2 Click the **Windows Start Button**<sup>®</sup>, and then click **Shut Down**.
- 3 Disconnect the modem/telephone cable, if present.



**CAUTION:** To reduce the risk of personal injury from electrical shock or hot surfaces, disconnect the power cord from the wall outlet, and allow the internal system components to cool before touching.

---

- 4 Disconnect the power cord from the electrical outlet and then from the PC.
- 5 Disconnect all other attached cables (such as the keyboard, mouse, and monitor).
- 6 Disconnect all external devices.



**CAUTION:** Static electricity can damage the electronic components of the PC or optional equipment. Ensure that you are discharged of static electricity by briefly touching a grounded metal object.

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## After Closing the PC

To avoid injury and equipment damage, always follow this procedure in this order after closing the PC:

- 1 Reconnect the power cord.



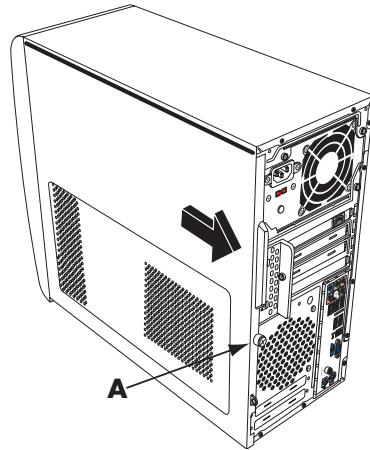
**WARNING:** To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telecommunications or telephone connectors into the network interface card (NIC) (labeled as an Ethernet connector).

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- 2 Reconnect the modem/telephone cable and all other cables (such as the keyboard, mouse, and monitor).
- 3 Reconnect external devices.
- 4 Turn on the PC and all peripherals such as the monitor.
- 5 If you installed an add-in card, install any software drivers supplied by the card manufacturer.

## Removing the Side Panel

- 1 See "Before Opening the PC" on page 2.
- 2 Loosen the thumbscrew (A) that secures the side panel to the PC chassis. You may need to use a screwdriver the first time you loosen the screw.



- 3 Use the handle to pull and slide the panel back about 1 inch (2.5 centimeters), and then lift it off the chassis.

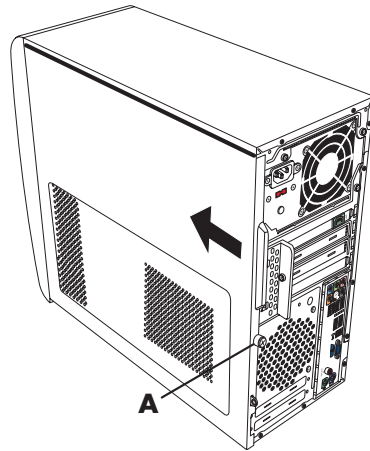


**WARNING:** Beware of sharp edges inside the chassis.

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## Replacing the Side Panel

- 1 Align the tabs at the bottom of the side panel to the ridge on the bottom of the chassis. Place the side panel in the proper position on the chassis and slide it toward the front of the chassis.



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**NOTE:** There is a 3mm gap between the top of the side panel and the top of the chassis when the side panel is attached properly.

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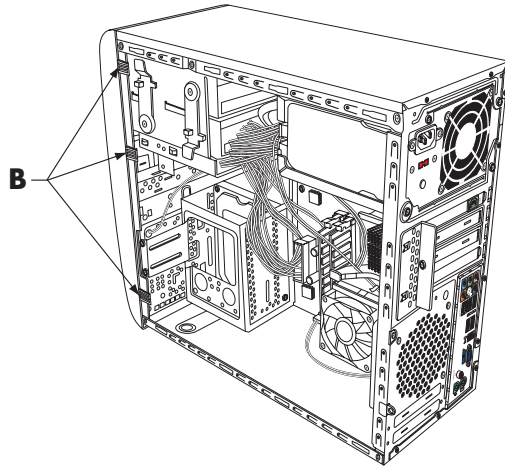
- 2 Ensure that the hole for the thumbscrew aligns with the hole in the chassis, and then replace the thumbscrew **(A)**.
- 3 See "After Closing the PC" on page 3.



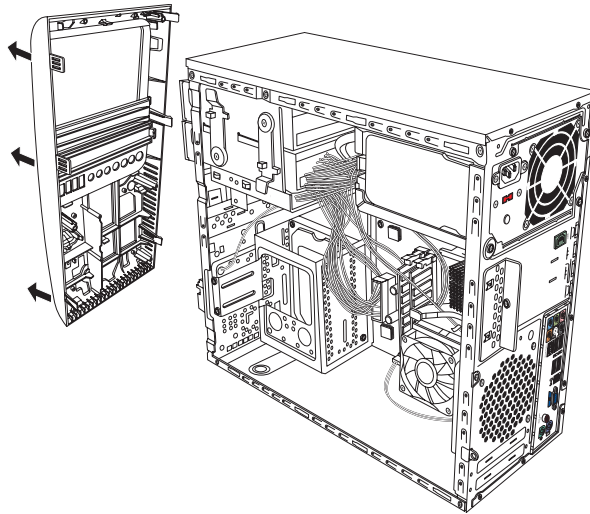
## Removing the Front Panel

This procedure is necessary only when removing or replacing an optical drive, memory card reader, an HP Pocket Media Drive, diskette drive, or the hard disk drive.

- 1 Pull the three tabs (**B**) away from the outside edge of the chassis.

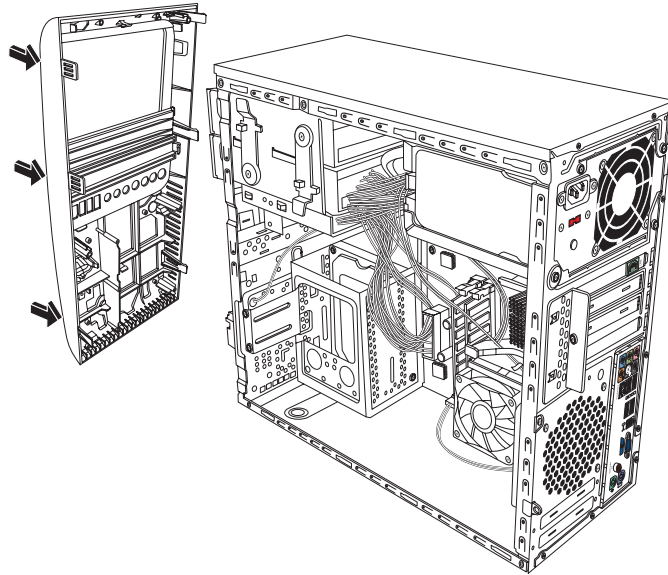


- 2 Swing the front panel away from the chassis toward the left to remove it.

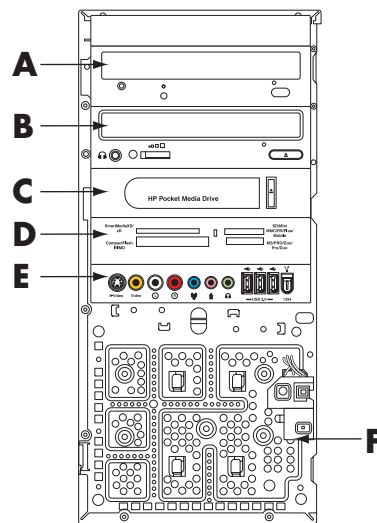


## Replacing the Front Panel

- 1 Align and insert the three hooks on the left side of the front panel with the holes on the left side of the chassis.
- 2 Swing the front panel around and press the three hooks on the right side of the front panel into the three holes on the right side of the chassis until the panel snaps into place.



# Locating Components Inside the Computer



- A** Upper 5.25-inch optical drive bay, may be a CD-ROM, CD-RW, DVD-ROM, DVD+RW/+R, or combination drive
- B** Lower 5.25-inch optical drive bay, may be empty (knockout plate) or a CD-ROM, CD-RW, DVD-ROM, DVD+RW/+R, combination drive, or HP Personal Media Drive bay
- C** HP Pocket Media Drive bay, a hard disk drive, or a diskette (floppy) drive (select models)
- D** Memory card reader (select models)
- E** Front connector panel (no replacement instructions)
- F** Hard disk drive and space for a second hard disk drive (located inside the chassis) (select models only)

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**NOTE:** The connectors and components of your chassis model may vary from the illustration.

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# Removing and Replacing Drives

Your PC has several drives that you can replace or upgrade. See the preceding topic, “Locating Components Inside the Computer” on page 7 for drive type and location.

The hard disk drive is either a Serial ATA (advanced technology attachment) drive, which uses a narrow data cable, or a Parallel ATA drive, which uses a wide data cable.

Select models have a second hard disk drive.



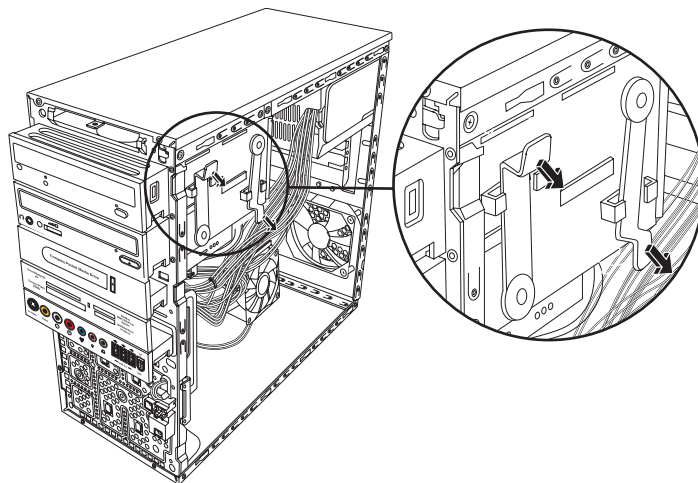
**CAUTION:** Back up your personal files on the hard disk drive to an external storage device, such as a CD, before removing the hard disk drive. Failure to do so will result in data loss. After replacing the hard disk drive, you need to run System Recovery using the recovery discs to load the factory-installed files. See the user documentation that came with your PC for details about the recovery procedure.

You can add an optical drive into an empty lower optical drive bay.

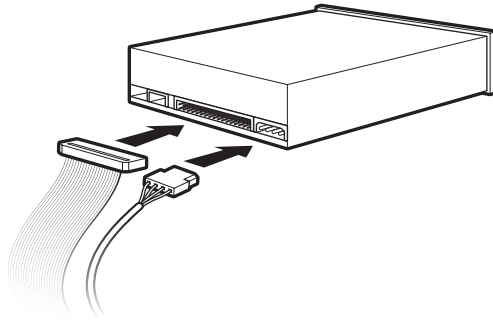
**IMPORTANT:** Before adding a new optical drive, make sure that it is compatible with the Microsoft Windows Vista™ operating system. Also, make sure you have the correct software and drivers for the optical drive to work with the operating system.

## Removing an Optical Drive

- 1 Complete the procedures to prepare the PC to remove the side panel and to remove the front panel. See “Opening and Closing the PC” on page 1.
- 2 Release the drive by pulling the latch out away from the chassis and then pulling the drive part way out of the front of the chassis. (The latch drive brackets secure the drives in their respective positions in the chassis.)



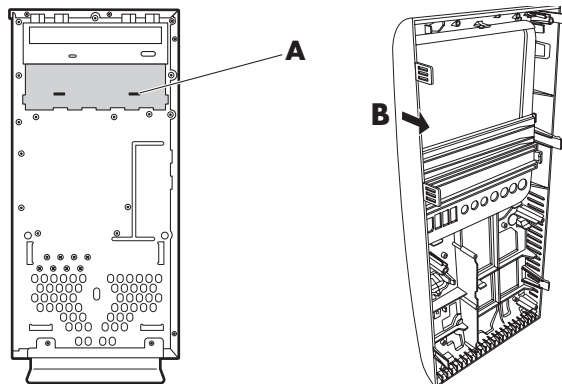
- 3 Disconnect the power, data, and the sound cable, if available, from the back of the optical drive you want to remove. For most drive cables, use a gentle rocking motion to free the plug. For Serial ATA hard disk drive cables, press the latch (select models only) in the center of each plug, and pull the plug from the drive connector.



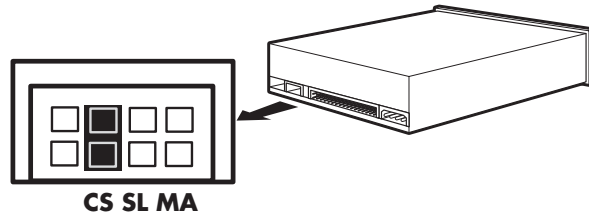
- 4 Pull the drive out through the front of the chassis.

## Adding or Replacing an Optical Drive

- 1 If necessary, remove the existing drive. See “Removing an Optical Drive” on page 8.
- 2 If you are adding a drive to an empty lower optical drive bay, you must remove the knockout plate from the bay. To do so, insert a flat screwdriver into the knockout plate slot **(A)** and rotate the screwdriver to break the knockout plate out of the chassis. Discard the knockout plate.
- 3 Remove the knockout plate on the front cover. To do so, insert a flat screwdriver into the knockout plate slot **(B)** and rotate the screwdriver to break the knockout plate out of the front cover. Discard the knockout plate.

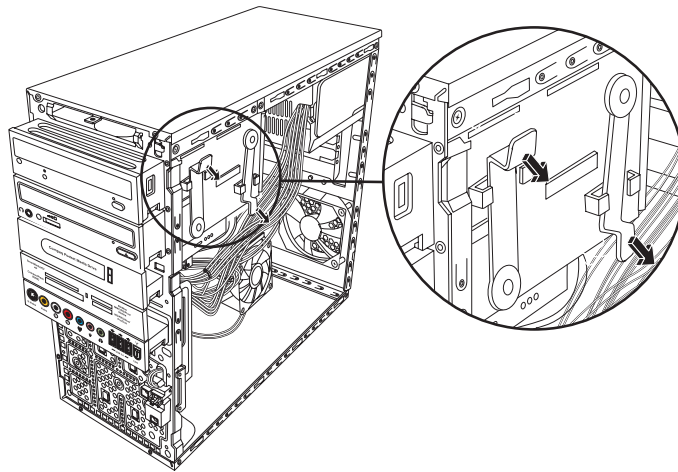


- 4 Make sure the jumper on the new optical drive or new Parallel ATA hard disk drive is in the CS (Cable Select) position. Your drive may vary from the illustration. The Serial ATA hard disk drive does not use Cable Select.

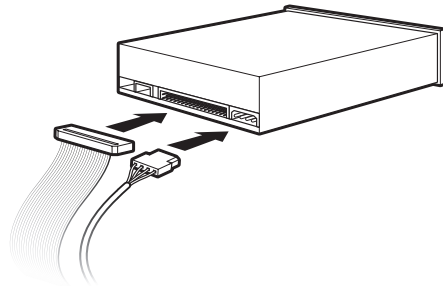


### Cable Select jumper

- 5 Release the drive bay by pulling the latch out away from the chassis and then sliding the drive part way into the front of the chassis. (The latch drive brackets secure the drives in their respective positions in the chassis.)



- 6 Connect the power and data cables from the back of the optical drive you want to add. Reconnect the sound cable, if present.

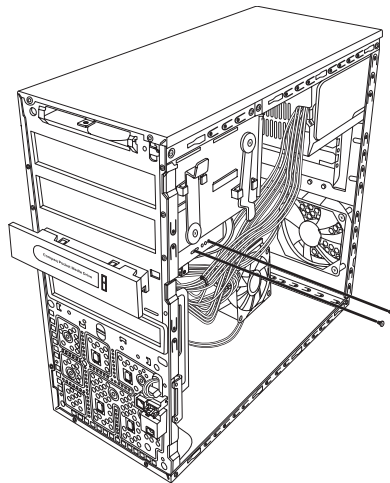


**WARNING:** For a second Parallel ATA drive, make sure to connect the data cable labeled Master to the primary hard disk drive, and the data cable labeled Slave to the secondary hard disk drive. If the data cable is not connected correctly, the PC is unable to locate the hard disk drive and data may be lost.

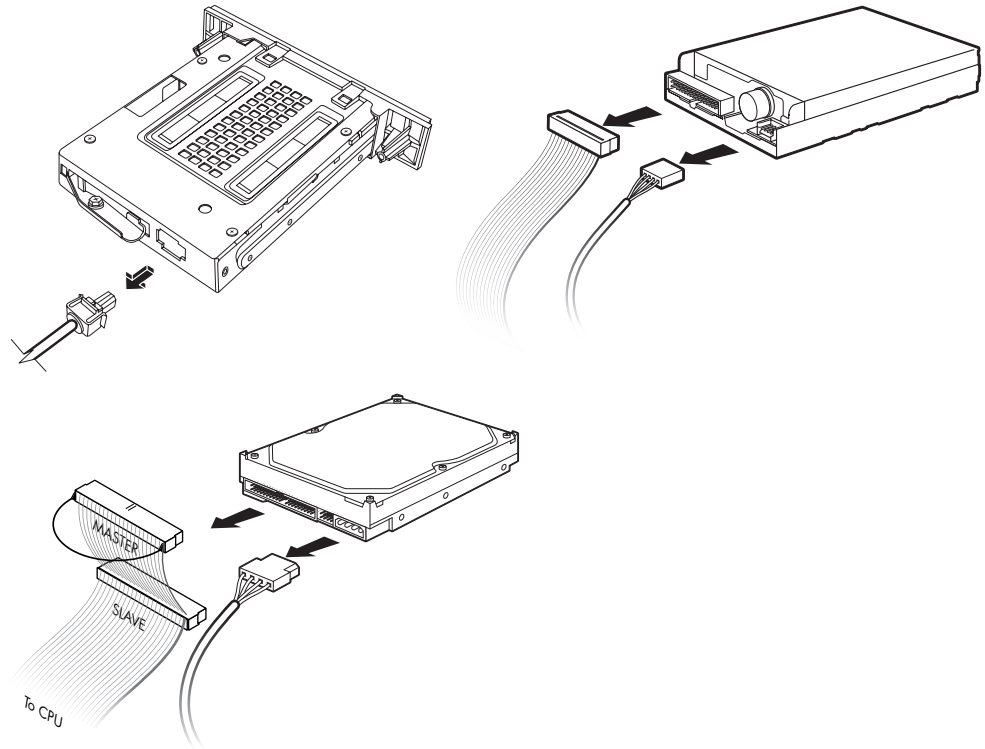
- 7 Make sure the drive is pushed all the way in through the front of the chassis until it locks into place.
- 8 Make sure the drive latch pin is fully inserted into the hole labeled (1).
- 9 Complete the procedures to replace the front panel, replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

## Removing the HP Pocket Media or Diskette or Hard Disk Drive

- 1 Complete the procedures to prepare the PC to remove the side panel and to remove the front panel. See "Opening and Closing the PC" on page 1.
- 2 Release the HP Pocket Media or diskette (floppy), or hard disk drive, by removing the two screws on the side of the drive, and then slide the drive part way out of the front of the chassis.



- 3** Disconnect the power and data cables from the back of the drive by squeezing the two latches and pulling the cable.

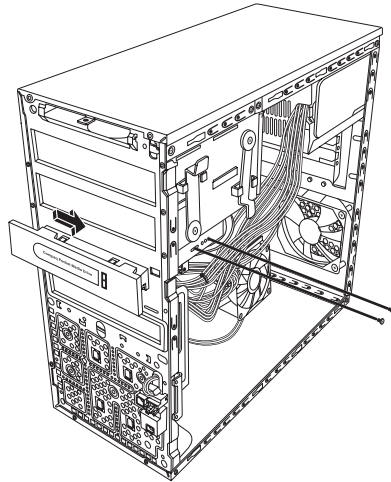


- 4** Pull the drive out through the front of the chassis.

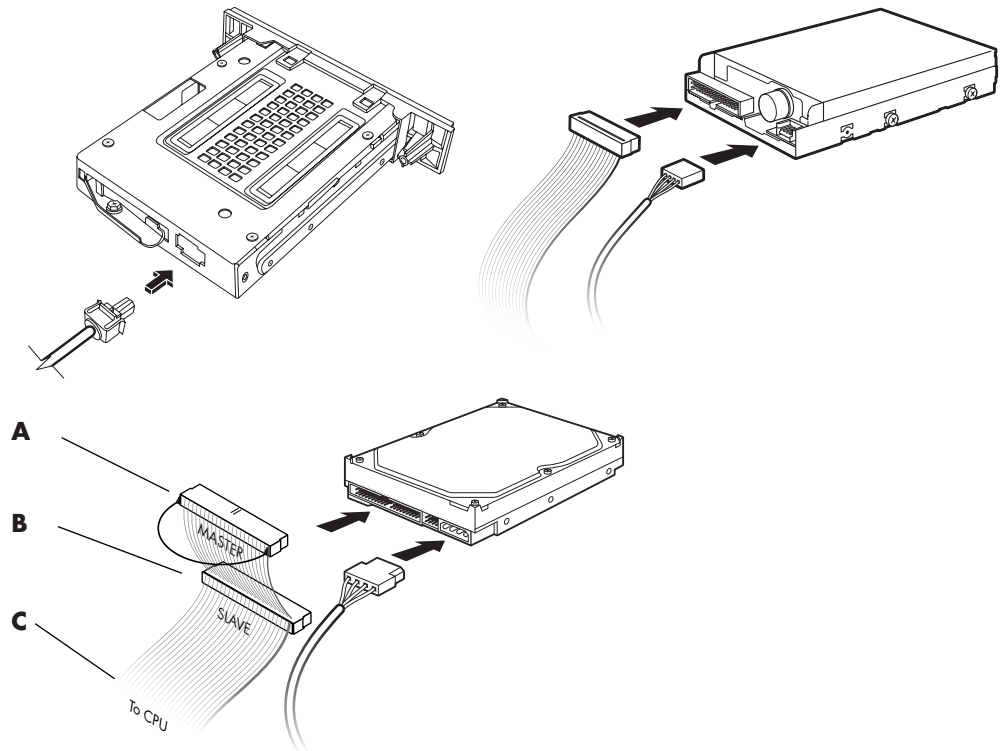


## Adding or Replacing the HP Pocket Media or Diskette or Hard Disk Drive

- 1** Complete the procedures to remove the HP Pocket Media, diskette (floppy), or hard disk drive, if necessary. See "Removing the HP Pocket Media or Diskette or Hard Disk Drive" on page 11.
- 2** Slide the HP Pocket Media, diskette (floppy), or hard disk drive into the front of the chassis until it locks into place.
- 3** Align the two screw holes on the chassis with the two screw holes on the side of the drive, and then attach the two screws. For the HP Pocket Media and diskette (floppy) drive, make sure to insert the screw into the holes labeled (1). For a hard disk drive, make sure to insert the screw into the holes labeled HDD.



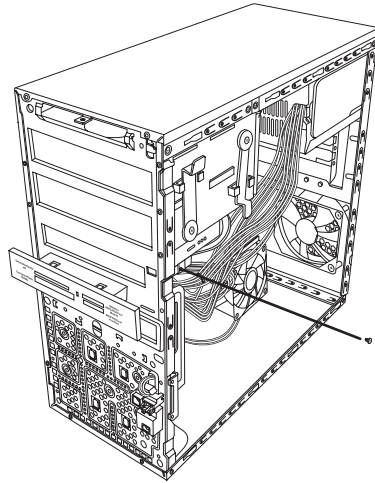
- 4** Connect the power and data cables to the back of the HP Pocket Media, diskette (floppy), or hard disk drive.



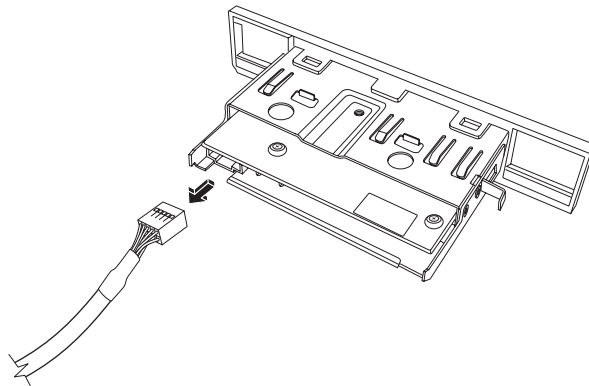
- A** — Connect to a primary hard disk drive.  
**B** — Connect to a secondary hard disk drive (select models only).  
**C** — Connect to the PC motherboard.
- 5** Complete the procedures to replace the front panel, replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

## Removing the Memory Card Reader

- 1 Complete the procedures to prepare the PC to remove the side panel and to remove the front panel. See "Opening and Closing the PC" on page 1.
- 2 Release the drive by removing the screw on the right side of the memory card reader, sliding the reader to the left to loosen it, and then pulling the memory card reader part way out of the front of the chassis.



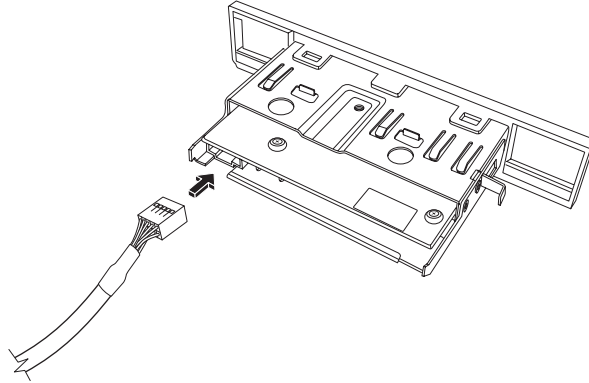
- 3 Disconnect the cable from the back of the memory card reader.



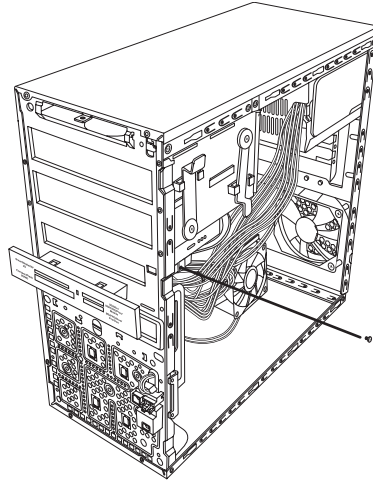
- 4 Pull the memory card reader out of the front of the chassis.

## Adding or Replacing the Memory Card Reader

- 1 Complete the procedures to remove the memory card reader, if necessary. See “Removing the Memory Card Reader” on page 15.
- 2 Slide the memory card reader part way into the front of the chassis.
- 3 Attach the cable to the back of the memory card reader.



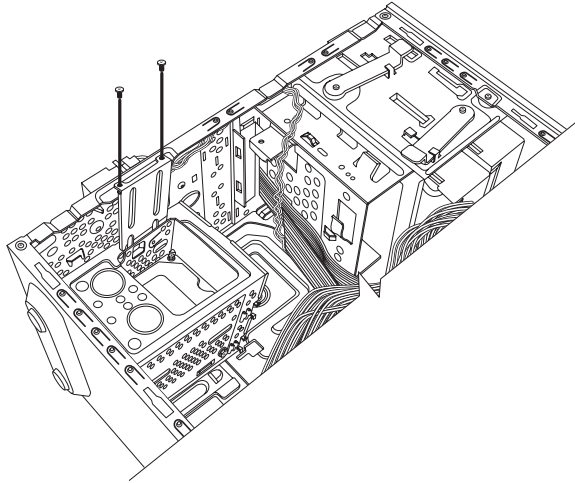
- 4 Push the memory card reader into the chassis until the screw hole on the chassis is aligned with the screw hole on the right side of the memory card reader, and then insert the screw to secure the memory card reader to the chassis.



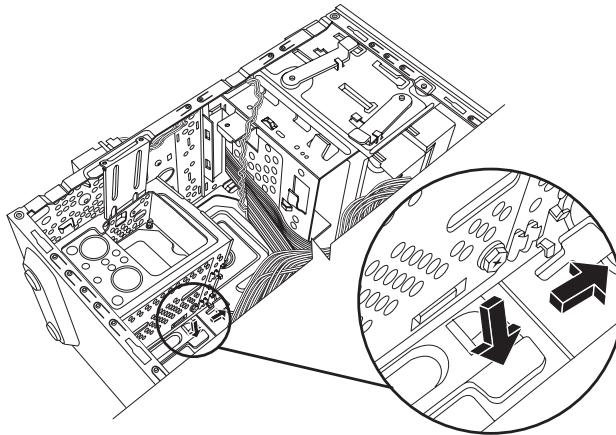
- 5 Complete the procedures to replace the front panel, replace the side panel, and close the PC. See “Opening and Closing the PC” on page 1.

## Removing the Hard Disk Drive

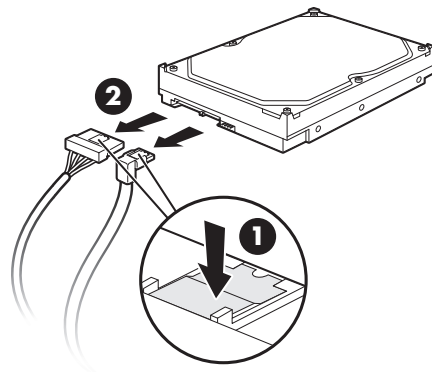
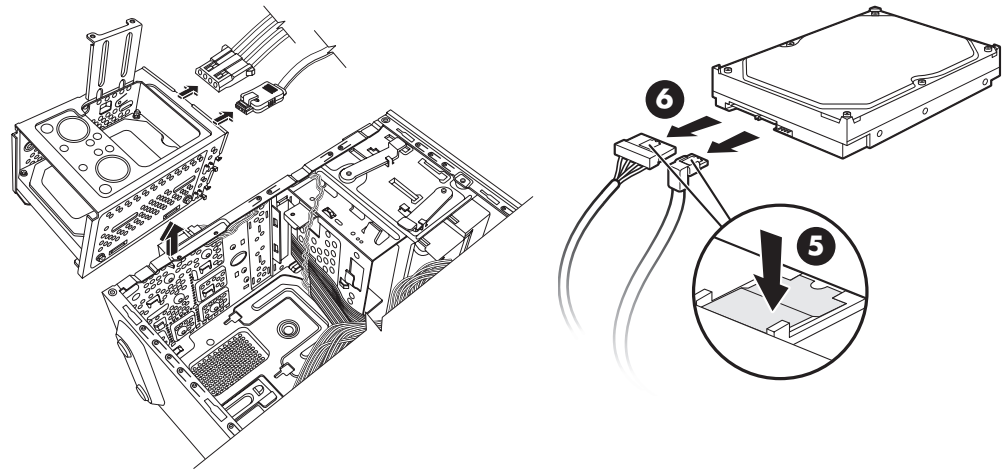
- 1 Complete the procedures to prepare the PC to remove the side panel and to remove the front panel. See "Opening and Closing the PC" on page 1.
- 2 Lay the computer gently on its side.
- 3 Remove the two screws that secure the hard disk drive cage to the chassis.



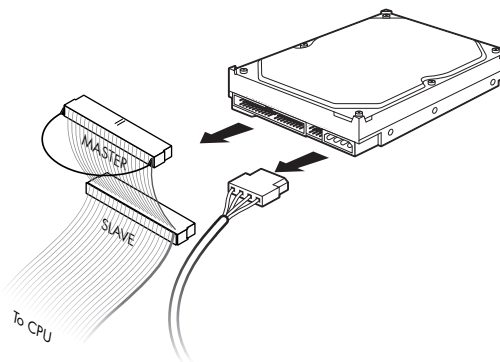
- 4 Push down the latch on the side of the hard disk drive cage, and then slide the hard disk drive cage away from the bottom of the chassis as shown below.



- 5 Lift the hard disk drive cage out of the chassis, and then remove the hard disk drive cables (1, 2). For most drive cables, use a gentle rocking motion to free the plug. For Serial ATA hard disk drive cables, press the latch (5) (select models only) in the center of each plug (6), and pull the plug from the drive connector.

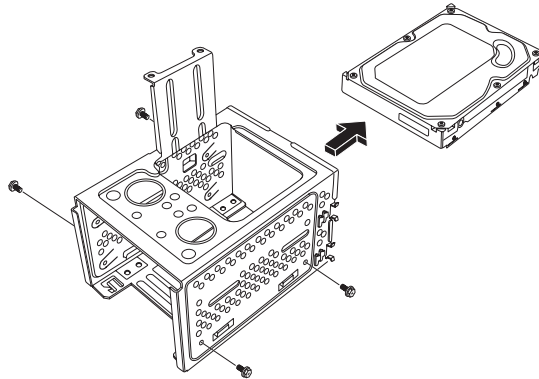


### Disconnecting the Serial ATA hard disk drive cables



### Disconnecting the Parallel ATA hard disk drive cables

- 6 Remove the four screws that secure the hard disk drive to the hard disk drive cage, and then slide the hard disk drive out of the hard disk drive cage.



## Adding or Replacing a Hard Disk Drive

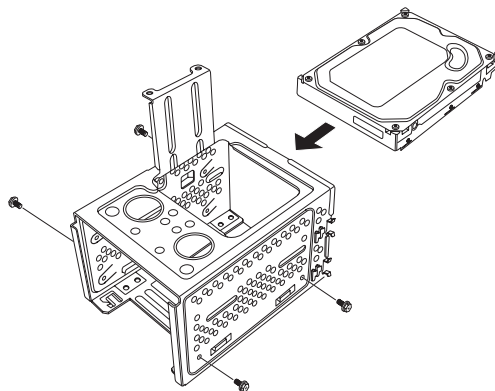
- 1 If necessary, remove the existing drive. See “Removing the Hard Disk Drive” on page 17.
- 2 Slide the new drive into the hard disk drive cage, aligning the drive with the four screw holes on the cage. Install the four screws that secure the hard disk drive to the hard disk drive cage. Make sure the hard disk drive cables are facing the top of the drive cage.

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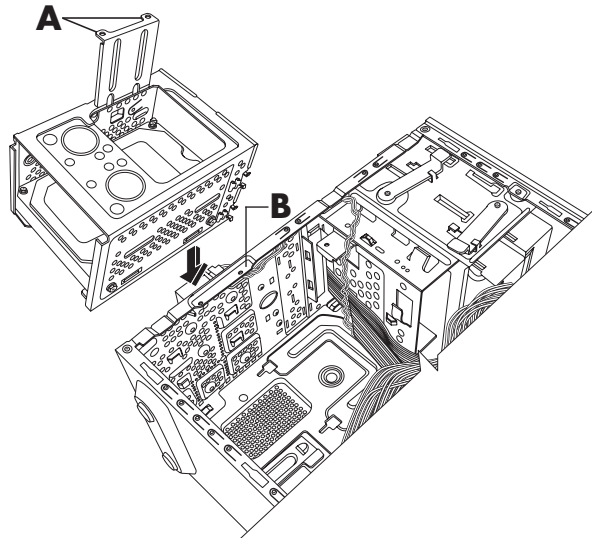
**NOTE:** If you are replacing an old drive with a new drive, remove the four guide screws from the old drive, and use the screws to install the new drive.

If you are installing a second hard disk drive, use four standard 6-32 screws that you purchase separately.

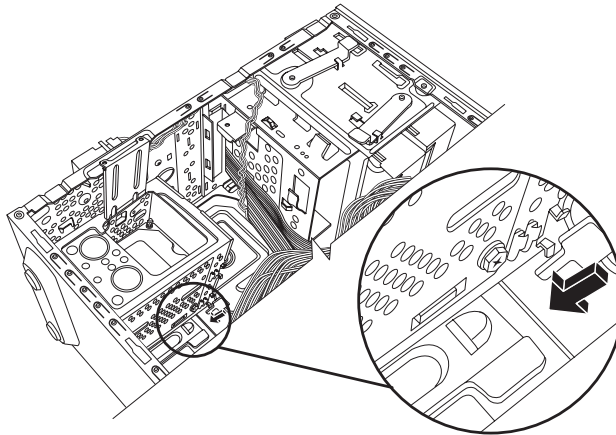
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- 3 Place the hard disk drive cage into the chassis. The two screw holes on the hard disk drive cage (**A**) should be aligned with the screw holes on the chassis (**B**).

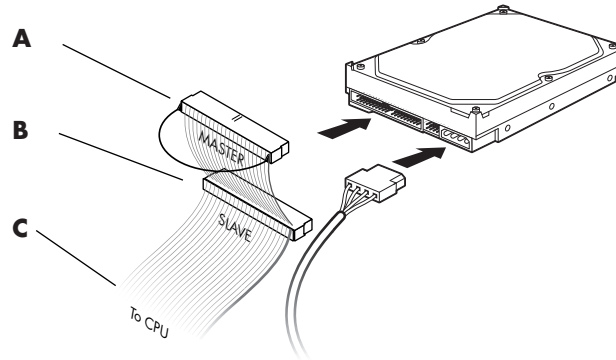


- 4 Align the four guides on the bottom of the hard disk drive cage with the holes on the back of the chassis, and then slide it down toward the bottom of the chassis until it locks into place.





**5** Attach the hard disk drive cables.

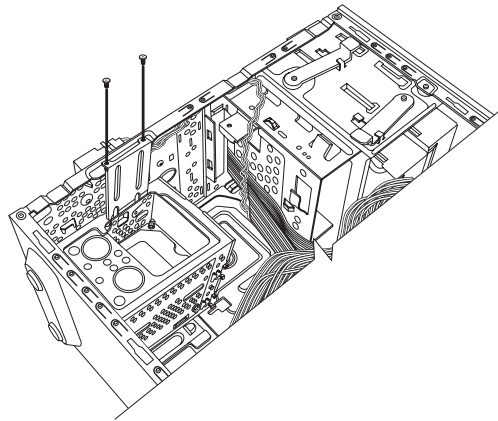


**A** — Connect to a primary hard disk drive.

**B** — Connect to a secondary hard disk drive (select models only).

**C** — Connect to the PC motherboard.

**6** Attach the two screws that secure the hard disk drive cage to the chassis.

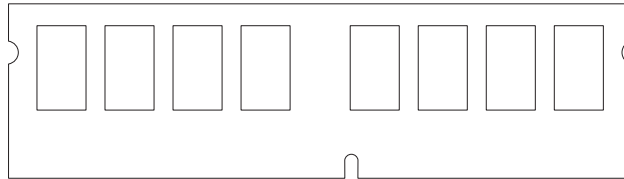


**7** Complete the procedures to replace the front panel, replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

# Adding Memory

Your PC comes with random access memory (RAM), which temporarily stores data and instructions on your PC. The PC ships with one or more memory modules, but you can replace the existing memory module(s) with higher-capacity ones.

The motherboard contains sockets for DDR DIMMs (double data rate dual in-line memory modules). The exact number of sockets and type of DDR memory module depends on which model PC you have.



## DDR DIM

To determine which type and speed of memory module your PC uses, and for specific memory module information and specifications, go to the Web site listed in your *Warranty and Support Guide*, and click the **Support** link.



**WARNING: Using the wrong type of memory module could damage the system.**

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## Removing a Memory Module

- 1 Complete the procedures to prepare the PC and to remove the side panel. See “Opening and Closing the PC” on page 1.
- 2 Gently lay the PC on its side.
- 3 Locate the memory sockets on the motherboard.

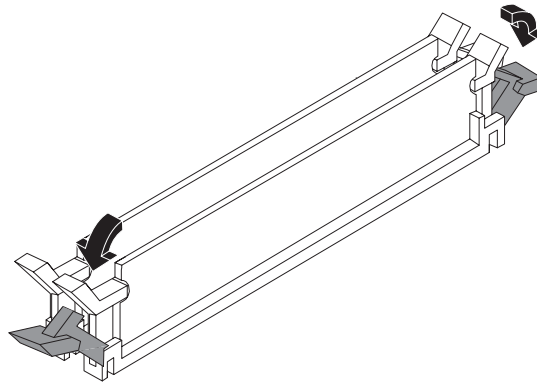


**CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.**

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- 4 Move any cabling out of the way, if necessary.

- 5 Push down the two retaining clips on the ends of the memory socket until the memory module pops out of the socket.



**WARNING:** Do not pull the memory module out of the socket. Use the retaining clips to remove the module.

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- 6 Lift the memory module from the memory socket.

## Installing a Memory Module

Upgrade the memory in your PC with memory of the same type and speed as the memory originally installed in your PC.



**CAUTION:** When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

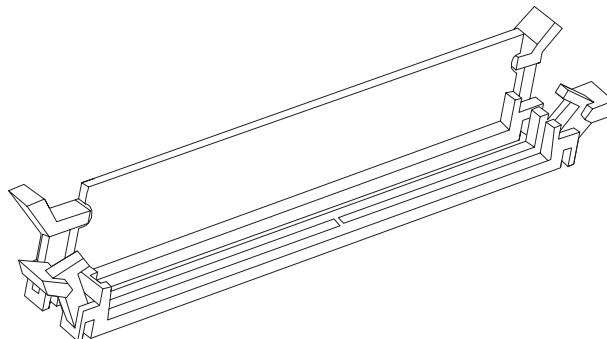
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- 1 Open both latches of the memory module socket:

If you are *replacing* a memory module, put the new memory module in the same memory slot from which the old memory was removed.

Or

If you are *adding* a memory module, install the new module into the socket nearest the preinstalled module, and install additional modules in the next available sockets.



- 2 Set the chassis upright.
- 3 Complete the procedures to replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

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**NOTE:** If a blank screen is displayed after replacing or adding a memory module, the memory is installed incorrectly or it is the wrong type of memory. Remove and reinstall the memory module.

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## Removing or Installing an Add-in Card

An add-in card is a circuit board, such as a PCI or an AGP card, that fits into a PC add-in card slot. Your PC contains several add-in card slots that can be used to add components to your PC. The PC component configurations vary by model.



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**WARNING:** Do not overload the system by installing add-in cards that draw excessive current. The system is designed to provide two amps (average) of +5 V<sup>⌚</sup> power for each board/card in the computer. The total +5 V<sup>⌚</sup> current draw in a fully loaded system (one with all add-in card slots filled) must not exceed the total number of slots multiplied by two amps.

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A flat-head and a Phillips screwdriver are needed to remove, replace, or add an add-in card.

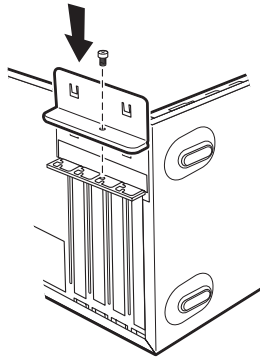
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**NOTE:** A power supply upgrade may be required for certain graphics card upgrades. Check with the graphics card supplier for more information about power supply requirements.

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## Removing an Add-in Card

- 1 Complete the procedures to prepare the PC and to remove the side panel. See “Opening and Closing the PC” on page 1.
- 2 Gently lay the PC on its side.
- 3 On the back of the PC, remove the screw from the bracket cover for the add-in card slots, and then remove the bracket cover.

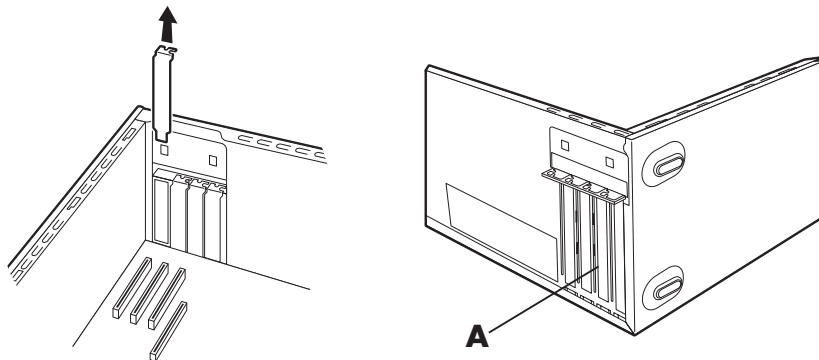


- 4 Inside the the PC, locate the add-in card slots on the motherboard.



**WARNING: Be careful of the sharp edges on the add-in card slot cover.**

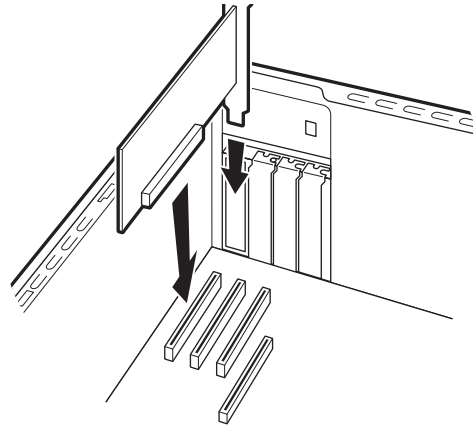
- 5 Remove the slot cover. Hold the card at each end, carefully rock it back and forth until the connectors pull free from the socket, and then remove the card. Or you can insert a flat screwdriver into the knockout plate slot (A) and rotate the screwdriver to break the knockout plate. Be sure not to scrape the card against the other components. Store the old card in the anti-static packaging that contained your new card.



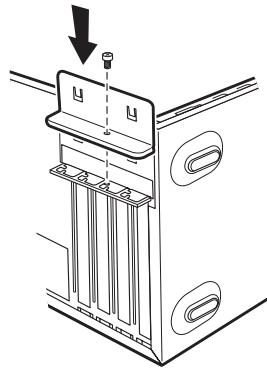
- 6 If you are not replacing the old add-in card with a new add-in card, close the open slot by inserting the metal slot cover into the opened slot.

## Installing an Add-in Card

- 1 Align the edge of the add-in card with the slot on the chassis and gently but firmly press the card straight down into the add-in card slot. The whole connector should be seated properly in the card slot.



- 2 On the back of the PC, replace the bracket cover for the add-in card slots, and then install the screw.



- 3 Set the chassis upright.
- 4 Complete the procedures to replace the side panel, and close the PC. See "Opening and Closing the PC" on page 1.

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**NOTE:** If the new card or device isn't working, read through the card manufacturer's installation instructions and recheck all connections, including those to the card, power supply, keyboard, and monitor.

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# Replacing the Battery

A lithium battery on the motherboard provides backup power for the PC's timekeeping ability. The battery has an estimated life expectancy of seven years.

When the battery starts to weaken, the date and time may be incorrect. If the battery fails, replace it with a CR2032 lithium battery (3 volt, 220mAh rating) or an equivalent battery.



**WARNING: There is danger of explosion if the battery is incorrectly replaced. Replace only with the same, or equivalent, type of battery. Discard used batteries according to the manufacturer's instructions.**

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- 1 Complete the procedures to prepare the PC and to remove the side panel. See "Opening and Closing the PC" on page 1.
- 2 Gently lay the PC on its side.
- 3 Remove any cabling, if necessary, to reach the battery.
- 4 Remove any memory modules, if necessary, to reach the battery. See "Adding Memory" on page 22.
- 5 To remove the battery, push the latch away from the battery and lift the battery from the socket.
- 6 Install the new CR2032 battery in the socket, with the positive (+) side facing the latch.
- 7 Replace the memory modules or cables you removed.
- 8 Set the chassis upright.
- 9 Complete the procedure to replace the side panel, and to close the PC. See "Opening and Closing the PC" on page 1.

Part number: 5991-6985