# Upgrading and Servicing Guide

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Hewlett-Packard Company
P.O. Box 4010
Cupertino, CA 95015-4010
USA

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# Upgrading and Servicing Guide

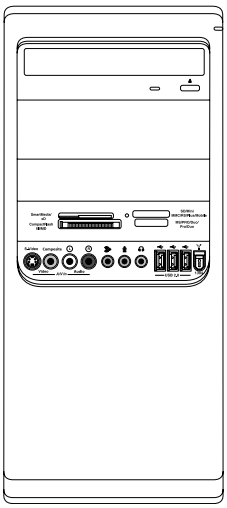
## Safety Information

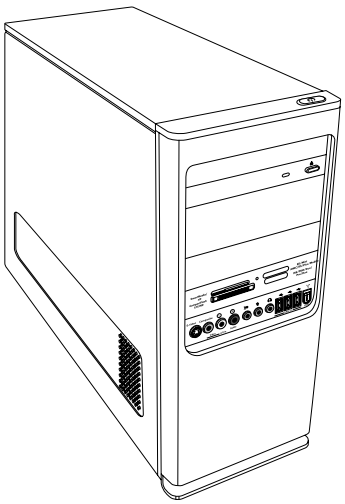
This product has not been evaluated for connection to an "IT" power system (an AC distribution system with no direct connection to the earth, according to IEC 60950).

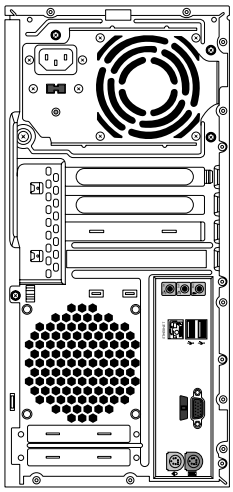
**WARNING: Before installing and connecting your system to the electrical power system, please read "Safety Information" in the *Limited Warranty and Support Guide*.**

This *Upgrading and Servicing Guide* provides instructions for removing and replacing hardware components of your computer.

## Opening and Closing the Computer







## Preparing the Computer

Before you can upgrade any component in your computer, you must prepare the computer so that you can safely handle it and the components.

Before attempting to upgrade or service the computer, read the following items:

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 computer model and serial numbers, all installed options, and other information about the computer. It is easier to consult this information than to open and examine the computer.
3. It is recommended that you use an antistatic wrist strap and a conductive foam pad when working on the computer.

**WARNING: Before removing the front and side panels of the computer, always disconnect the modem cord from the telephone system, and then disconnect the computer from the power source. Failure to do so can result in personal injury or equipment damage.**

## Before Opening the Computer

To avoid injury and equipment damage, always complete the following steps in this order, before opening the computer:

1. Remove any device, memory card, or optical disc (CD or DVD) from the computer.
2. Shut down the computer.
3. Disconnect the modem/telephone cable, if it is present.

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

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

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

## After Closing the Computer

To avoid injury and equipment damage, always complete the following steps in this order after closing the computer:

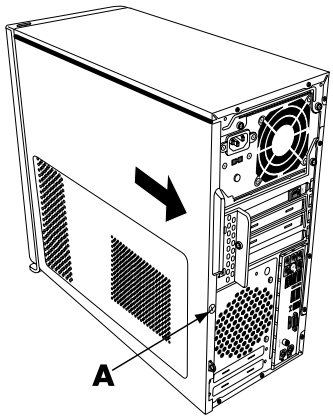
1. Reconnect the power cord.

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

2. Reconnect the modem/telephone cable and all other cables (such as the keyboard, mouse, and monitor cables).
3. Reconnect the external devices.
4. Turn on the computer 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 Computer" on page 2.
2. Use a screwdriver to loosen the screw (**A**) that secures the side panel to the computer chassis.

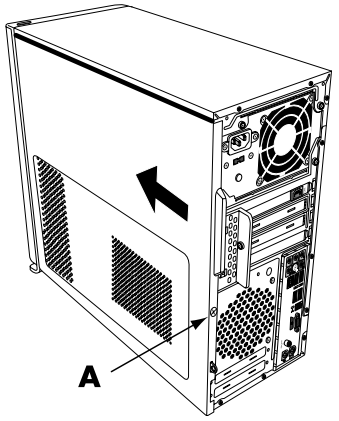



3. Use the handle to slide the panel back about 2.5 centimeters (1 inch), and then lift it off the chassis.

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

## Replacing the Side Panel

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



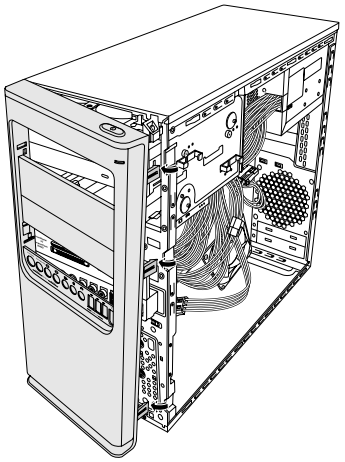

**NOTE:** There is a 3 millimeter gap between the top of the side panel and the top of the chassis when the side panel is attached properly.

2. Ensure that the hole for the screw is aligned with the hole in the chassis, and then replace the screw (**A**).
3. See "After Closing the Computer" on page 3.

## Removing the Front Panel

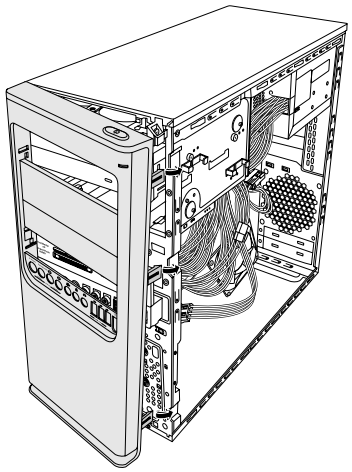
This procedure is necessary only when you are removing or replacing an optical drive, memory card reader, HP Media Drive bay, or the primary and secondary hard disk drives.

1. Pull the three tabs away from the outside edge of the chassis.
2. Swing the front panel (to the left) away from the chassis to remove it.

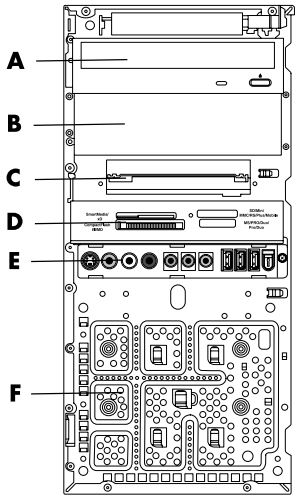


## Replacing the Front Panel

1. Align the three hooks on the left side of the front panel with the holes on the left side of the chassis, and then insert them.
2. Swing the front panel to the right (toward the chassis), and then 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 (13.34-centimeter) optical drive bay, which may be a CD-ROM, CD-RW, DVD-ROM, DVD+RW/+R, or combination drive

**B** Lower 5.25-inch (13.34-centimeter) optical drive bay, which may be empty (knockout plate), or a CD-ROM, CD-RW, DVD-ROM, DVD+RW/+R, combination drive, or HP Personal Media Drive bay (select models only)

**C** Primary hard disk drive

**D** Memory card reader (select models only)

**E** Front connector panel (no replacement instructions)

**F** Space for a second hard disk drive (a second hard drive must be purchased separately)

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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 computer has several drives that you can replace or upgrade. See "Locating Components Inside the Computer" on page 6 for the drive types and locations.

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: Before you remove your hard disk drive, back up your personal files 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 must run System Recovery using the recovery discs to load the factory-installed files. For details about the recovery procedure, see the user documentation that came with your computer.**

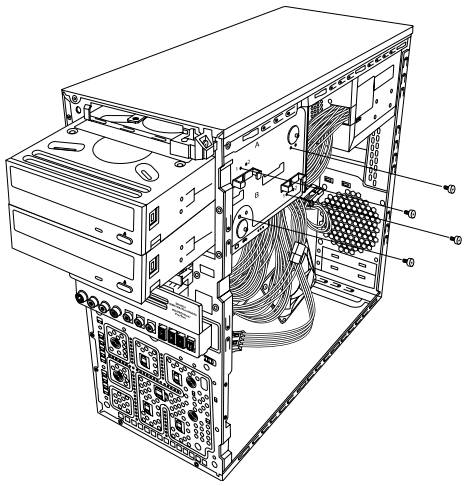
You can add an optical drive to an empty lower optical drive bay.

**IMPORTANT:** Before you add a new optical drive, ensure that it is compatible with the computer operating system. Also, ensure that you have the correct software and drivers for the optical drive to work with the operating system.

## Removing an Optical Drive

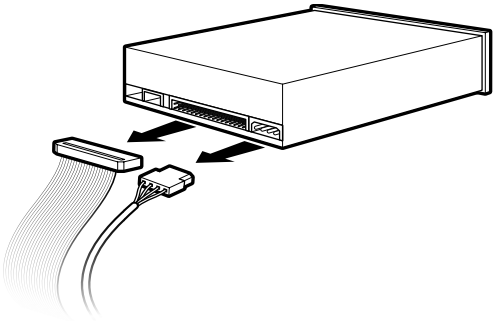
1. Prepare the computer to be opened, and then remove the side and front panels. See "Opening and Closing the Computer" on page 1.
2. Release the drive from the drive bay by removing the two screws on the side of the optical drive, and then pulling the drive partway out of the front of the chassis.

   **NOTE:** The following figure shows both optical drives. Your chassis may include one or two optical drives, depending on your model.



3 Disconnect the power and data cables, and the sound cable from the back of the optical drive you want to remove.

- For most drive cables, use a gentle rocking motion to free the connector.
- For Serial ATA hard disk drive cables, press the latch (select models only) in the center of each connector and then pull the connector out of the drive connector.



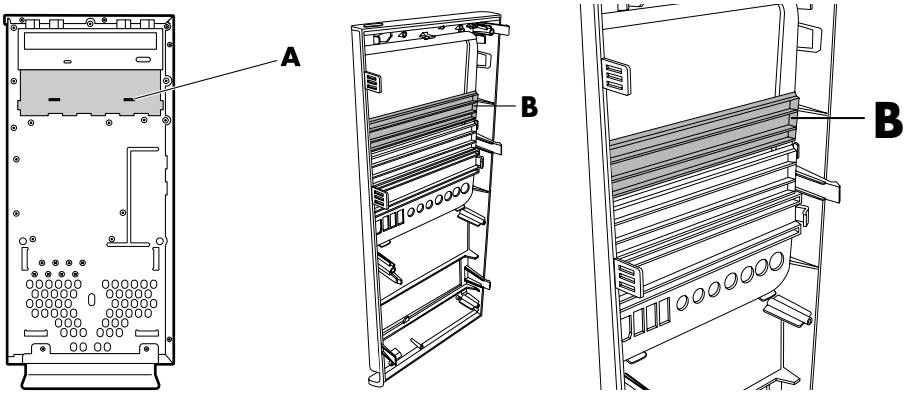
4 Pull the drive out through the front of the chassis.

## Adding or Replacing an Optical Drive

1 If you are replacing an existing drive, remove it. See "Removing an Optical Drive" on page 7.

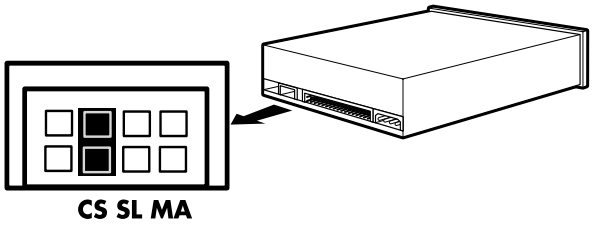
2 If you are adding a drive to an empty lower optical drive bay, you must remove the knockout plate from the bay. To do this, insert a flat-head screwdriver into the knockout plate slot (**A**), and then rotate the screwdriver to break the knockout plate out of the chassis. Discard the knockout plate.

3 If necessary, remove the knockout plate from the front panel. To do this, insert a flat-head screwdriver into the knockout plate slot (**B**), and then rotate the screwdriver to break the knockout plate out of the front panel. Discard the knockout plate.



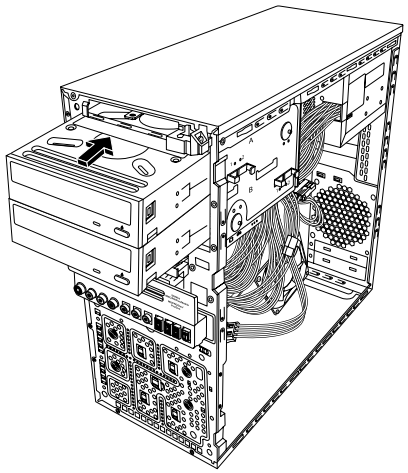
4 Ensure that the jumper on the new optical drive or the new Parallel ATA hard disk drive is in the CS (Cable Select) position. Your drive may vary from the illustration.

**NOTE:** The Serial ATA hard disk drive does not use Cable Select.

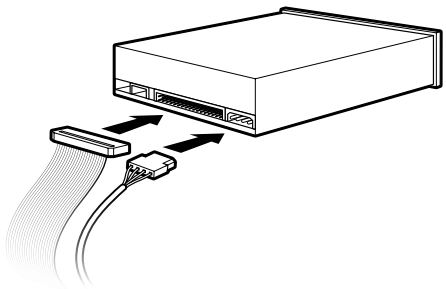



**Cable Select jumper**

5 Slide the optical drive partway into the front of the chassis.



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



**WARNING: If you are adding a second Parallel ATA drive, ensure that you 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 cables are not connected correctly, the computer will be unable to locate the hard disk drives and data may be lost.**

7 Push the drive all the way in through the front of the chassis until it locks into place.

8 Replace the two screws on the side of the optical drive into the holes labeled (**1**) on the chassis to secure it to the drive bay.

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**NOTE:** The following figure shows both optical drives. Your chassis may include one or two optical drives, depending on your model.

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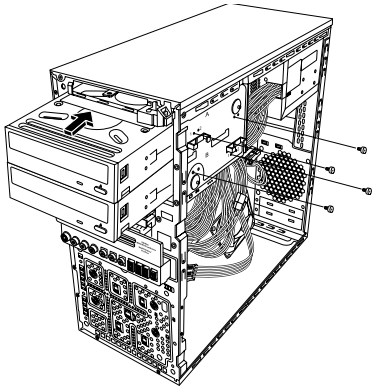
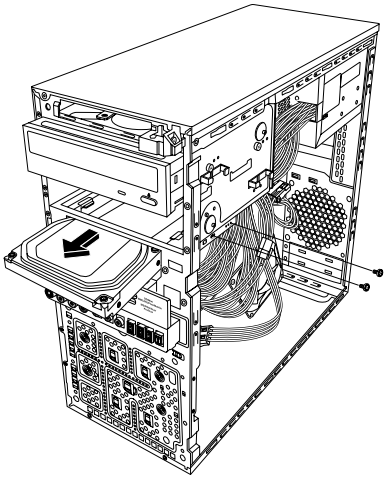


9 Replace the front and side panels, and close the computer. See "Opening and Closing the Computer" on page 1.

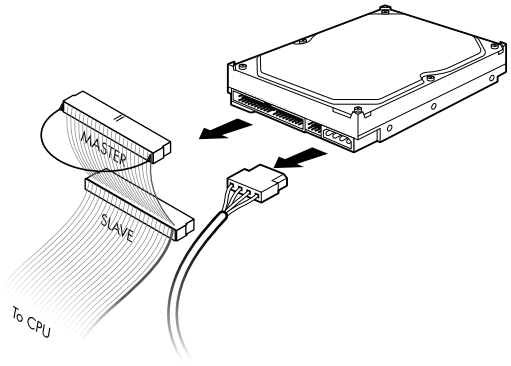
## Removing the Primary Hard Disk Drive

1 Prepare the computer to be opened, and then remove the side and front panels. See "Opening and Closing the Computer" on page 1.

2 Release the hard disk drive by removing the two screws on the side of the drive, and then slide the drive partway out of the front of the chassis.



3 Disconnect the power and data cables from the back of the drive.

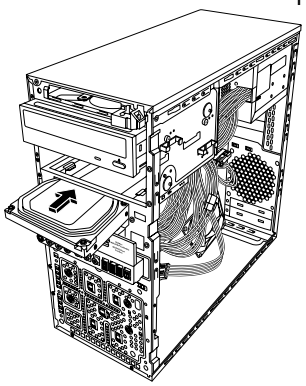



4 Pull the drive out through the front of the chassis.

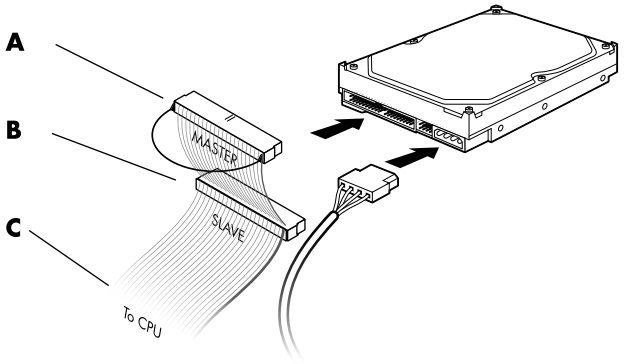
## Adding or Replacing the Primary Hard Disk Drive

1 If you are replacing the existing hard disk drive, remove it. See "Removing the Primary Hard Disk Drive" on page 10.

2 Slide the hard disk drive partway into the front of the chassis.



3 Connect the power and data cables to the back of the hard disk drive.



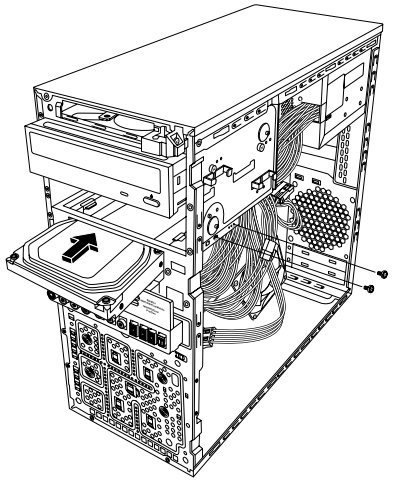

**A** — Connect to a primary hard disk drive.

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

**C** — Connect to the motherboard.

4 Slide the hard disk drive completely into the front of the chassis.

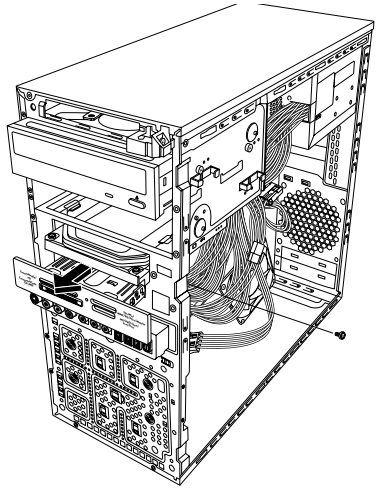
5 Align the two screw holes on the chassis with the two screw holes on the side of the drive labeled HDD, and then attach the two screws.



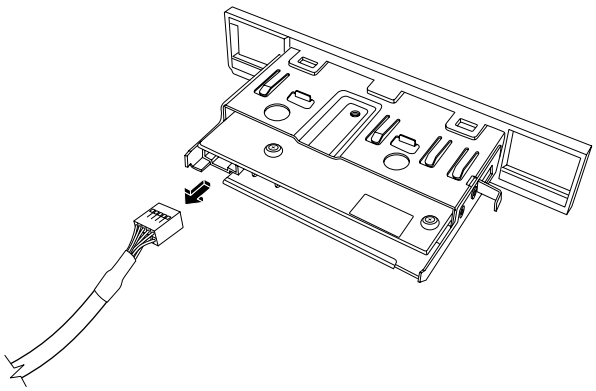
6 Replace the front and side panels, and then close the computer. See “Opening and Closing the Computer” on page 1.

## Removing the Memory Card Reader

1. Prepare the computer to be opened, and then remove the side and front panels. See "Opening and Closing the Computer" on page 1.
2. Release the memory card reader 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 it partway out through the front of the chassis.



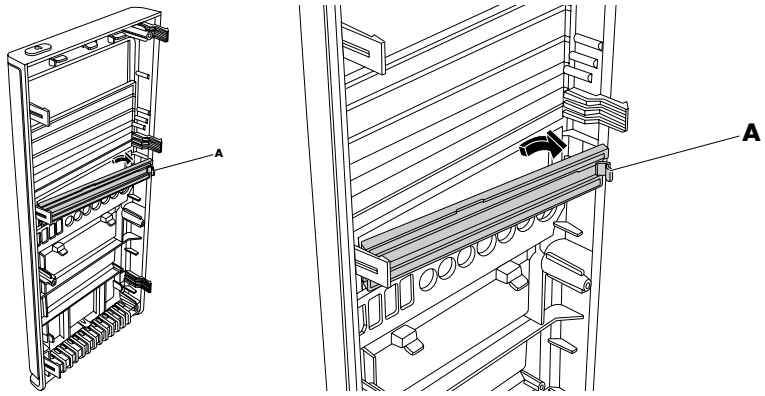
3. Disconnect the cable from the back of the memory card reader.



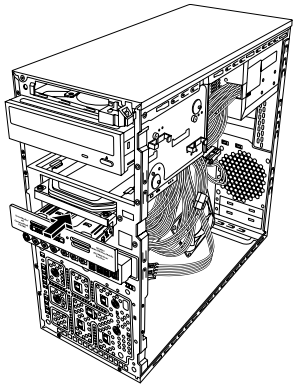
4. Pull the memory card reader out through the front of the chassis.

## Adding or Replacing a Memory Card Reader

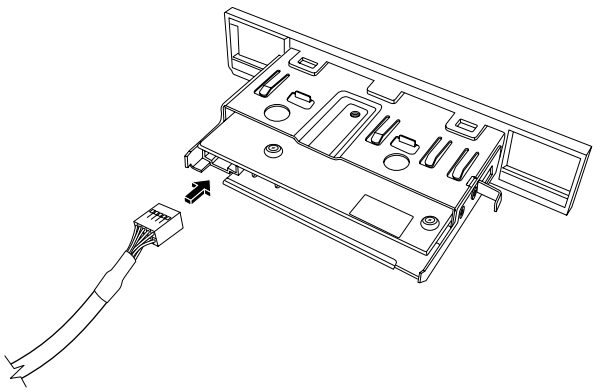
1. If you are replacing an existing memory card reader, remove it. See "Removing the Memory Card Reader" on page 13.
2. If necessary, remove the knockout plate on the front cover. To do this, press the release button (**A**), and then pull the plate out.



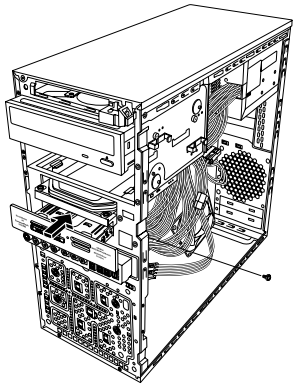

3. Slide the memory card reader partway into the front of the chassis.



4. Attach the data cable to the back of the memory card reader.



5 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 attach the screw to secure the memory card reader to the chassis.



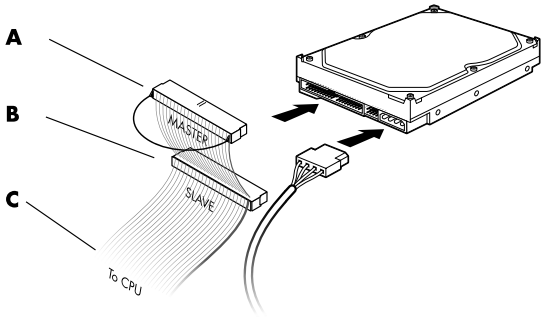
6 Replace the front and side panels, and then close the computer. See "Opening and Closing the Computer" on page 1.

## Adding or Replacing a Second Hard Disk Drive

**NOTE:** A second hard disk drive must be purchased separately.

1 If you are replacing the existing hard disk drive, remove it. See "Removing a Second Hard Disk Drive" on page 16.

2 Attach the hard disk drive cables. Ensure that the hard disk drive cables are facing the closed side panel of the chassis and not the open side panel.




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

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

**C** — Connect to the motherboard.

3 Align the new hard disk drive with the four screw holes on the front of the chassis, and then attach the four screws that secure the hard disk drive to the chassis. Make sure the data and power cables of the hard disk drive are facing the closed side panel and not towards the open side panel of the chassis.

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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 them 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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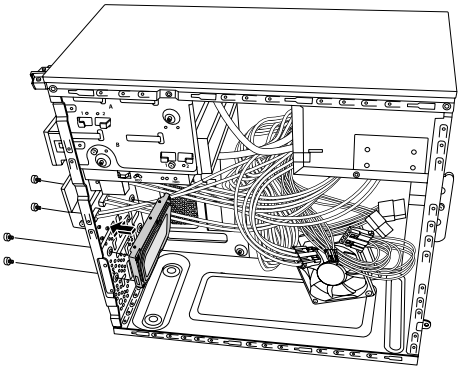
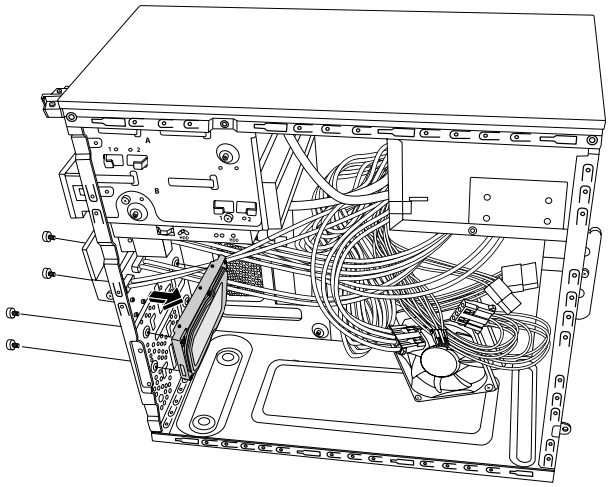


4 Replace the front and side panels, and then close the computer. See "Opening and Closing the Computer" on page 1.

## Removing a Second Hard Disk Drive

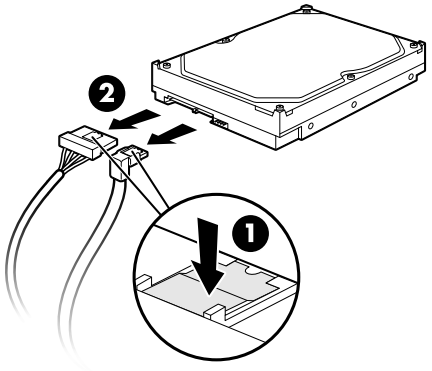
1 Prepare the computer to be opened, and then remove the side and front panels. See "Opening and Closing the Computer" on page 1.

2 Remove the four screws that secure the second hard disk drive to the chassis.

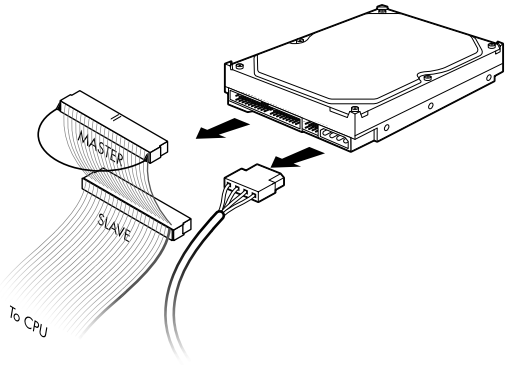


3 Lift the hard disk drive out of the chassis, and then remove the hard disk drive cables.

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




**Disconnecting the Serial ATA hard disk drive cables**

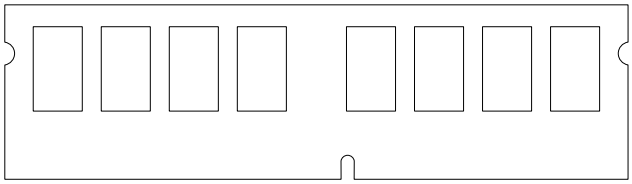



**Disconnecting the Parallel ATA hard disk drive cables**

# Adding Memory

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

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



**DDR DIMM**

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

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

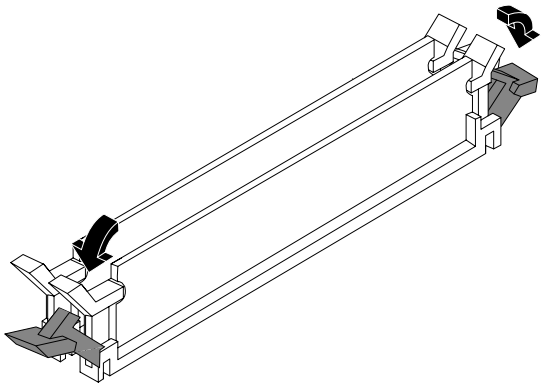
## Removing a Memory Module

1. Prepare the computer to be opened, and then remove the side panel. See "Opening and Closing the Computer" on page 1.
2. Gently lay the chassis 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.**

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 memory socket. Always use the retaining clips to remove the module.**

6 Lift the memory module out of the memory socket.

## Installing a Memory Module

Upgrade the memory in your computer with a memory module of the same type and speed as the modules originally installed in your computer.

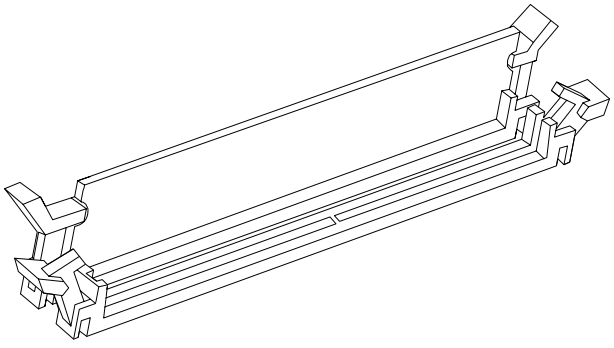
**CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.**

1 Open both latches of the memory module socket:

If you are *replacing* an existing memory module, install the new module in the same memory socket from which you removed the old module.

*Or*

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



2 Place the chassis upright.

3 Replace the side panel, and then close the computer. See "Opening and Closing the Computer" on page 1.

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

# Removing or Installing an Add-In Card

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

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

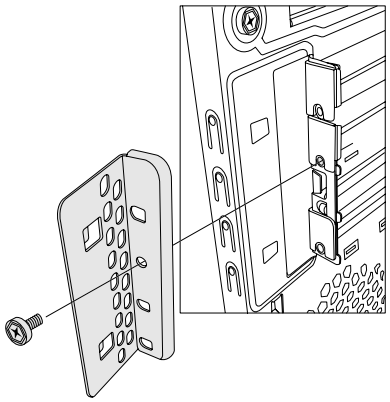
To remove, replace, or add an add-in card, you need a flat-head screwdriver and a Phillips screwdriver.

**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.

## Removing an Add-in Card

1 Prepare the computer to be opened, and then remove the side panel. See "Opening and Closing the Computer" on page 1.

2 On the back of the chassis, remove the screw from the bracket cover for the add-in card slots, and then remove the bracket cover.



3 Gently lay the chassis on its side.

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

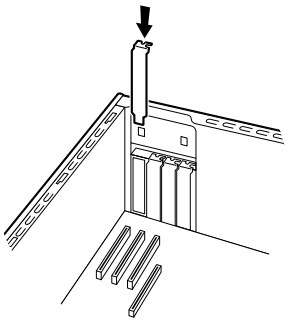
**WARNING: Beware of the sharp edges on the add-in card slot cover.**

5 Move any cabling out of the way, if this is necessary to reach the add-in cards.

6 Hold the card at each end, carefully rock it back and forth until the connectors pull free from the socket, and then lift the card from the chassis.

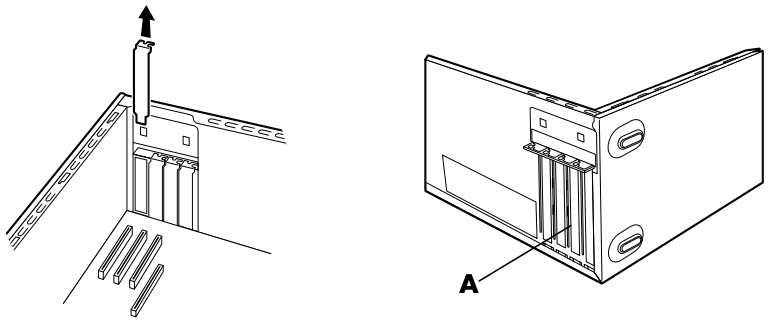
**NOTE:** Be sure not to scrape the add-in card against the other components. Store the old add-in card in the antistatic packaging that contained the new card.

7 If you are not replacing the old add-in card with a new add-in card, insert the metal slot cover into the open card slot.

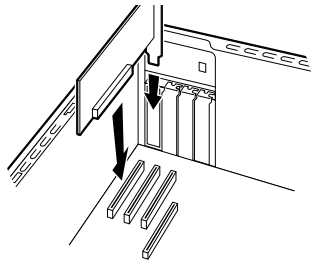


## Installing an Add-in Card

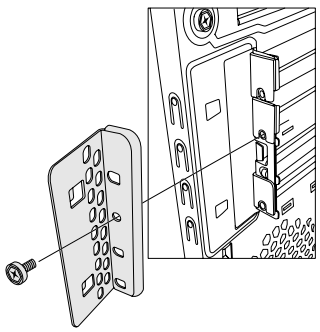
1 If necessary, remove the slot cover, or insert a flat-head screwdriver into the knockout plate slot (**A**), and then rotate the screwdriver to break the knockout plate.




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



3 Place the chassis upright, replace the bracket cover for the add-in card slots, and then attach the screw.



4 Replace the side panel, and then close the computer. See "Opening and Closing the Computer" on page 1.

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**NOTE:** If the new add-in card or device does not work, read 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 computer timekeeping capability. The battery has an estimated life expectancy of seven years.

When the battery starts to weaken, the date and time may become 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 it only with a battery of the same, or an equivalent, type. Discard used batteries according to the manufacturer's instructions.**

1. Prepare the computer to be opened, and then remove the side panel. See "Opening and Closing the Computer" on page 1.
2. Gently lay the chassis on its side.
3. Remove any cabling out of the way, if this is necessary in order to reach the battery.
4. Remove any memory modules, if this is necessary in order to reach the battery. See "Adding Memory" on page 18.
5. To remove the battery, push the latch away from the battery, and then lift the battery out of the socket.
6. Install the new CR2032 battery in the socket, with the positive (+) side facing the latch.
7. Replace any memory modules or cables that you removed.
8. Place the chassis upright.
9. Replace the side panel, and then close the computer. See "Opening and Closing the Computer" on page 1.

Part number: 5992-1508