Hardware Reference Guide - dc7900 Series Convertible Minitower

HP Compaq Business PC

Hardware Reference Guide

HP Compaq Business PC

dc7900 Series Convertible Minitower

About This Book

This guide provides basic information for upgrading this computer model.

⚠ **WARNING!** Text set off in this manner indicates that failure to follow directions could result in bodily harm or loss of life.

△ **CAUTION:** Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

✎ **NOTE:** Text set off in this manner provides important supplemental information.

Table of contents

1 Product Features

Standard Configuration Features

The HP Compaq Convertible Minitower features may vary depending on the model. For a complete listing of the hardware and software installed in the computer, run the diagnostic utility (included on some computer models only). Instructions for using the utility are provided in the *Troubleshooting Guide*.

NOTE: The HP Compaq Convertible Minitower computer can be easily converted to a desktop. For more information, see in this guide.

Figure 1-1 Convertible Minitower Configuration

Front Panel Components

Drive configuration may vary by model.

Figure 1-2 Front Panel Components
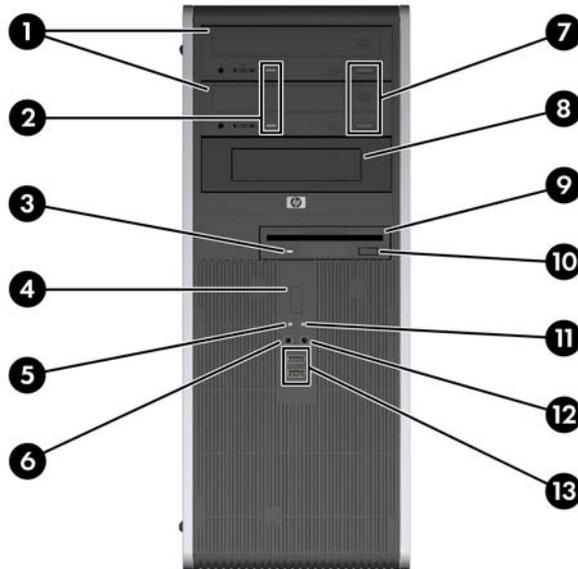
Table 1-1 Front Panel Components

1	5.25-inch Optical Drives	8	5.25-inch Bay for Optional Drives[2]
2	Optical Drive Activity Lights	9	Diskette Drive Activity Light (optional)
3	3.5-inch Diskette Drive (optional)[1]	10	Diskette Eject Button (optional)
4	Dual-State Power Button	11	Power On Light
5	Hard Drive Activity Light	12	Headphone Connector
6	Microphone Connector	13	USB (Universal Serial Bus) Ports
7	Optical Drive Eject Buttons		

CAUTION: The bottom 5.25-inch drive bay has a shorter depth than the upper two bays. The bottom bay supports a half-height drive or other device that is no more than 14.5 cm (5.7 inches) in depth. Do not try to force a larger drive, such as an optical drive, into the bottom bay. This could cause damage to the drive and the system board. The use of unnecessary force when installing any drive into the drive bay may result in damage to the drive.

[1]   Some models are configured with a media card reader in the external 3.5-inch drive bay. Other models have a bezel blank covering this bay.

[2]   Some models are configured with a media card reader in the external 5.25-inch drive bay. Other models have a bezel blank covering this bay.

Media Card Reader Components

The media card reader is an optional device available on some models only. Refer to the following illustration and table to identify the media card reader components.

**Figure 1-3** Media Card Reader Components
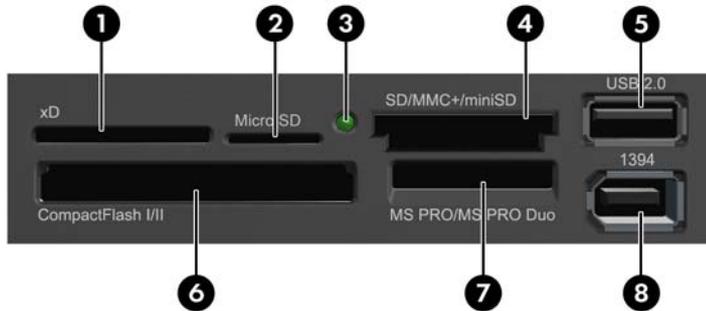
Table 1-2 Media Card Reader Components

No.	Slot	Media		
1	**xD**	● xD-Picture Card (xD)		
2	**MicroSD**	● MicroSD (T-Flash)	● MicroSDHC	
3	**Media Card Reader Activity Light**			
4	**SD/MMC+/miniSD**	● Secure Digital (SD)	● MiniSDHC	● MultiMediaCard 4.0 (MMC Plus)
		● Secure Digital High Capacity (SDHC)	● MultiMediaCard (MMC)	● Reduced Size MultiMediaCard 4.0 (MMC Mobile)
		● MiniSD	● Reduced Size MultiMediaCard (RS MMC)	● MMC Micro (adapter required)
5	**USB**	● USB (Universal Serial Bus) Port		
6	**CompactFlash I/II**	● CompactFlash Card Type 1	● CompactFlash Card Type 2	● MicroDrive
7	**MS PRO/MS PRO DUO**	● Memory Stick (MS)	● Memory Stick Select	● Memory Stick PRO Duo (MS PRO Duo)
		● MagicGate Memory Stick (MG)	● Memory Stick Duo (MS Duo)	● Memory Stick PRO-HG Duo
		● MagicGate Memory Duo	● Memory Stick PRO (MS PRO)	● Memory Stick Micro (M2) (adapter required)
8	**1394**	● 1394 Port (available on select models only)		

Rear Panel Components

Figure 1-4 Rear Panel Components
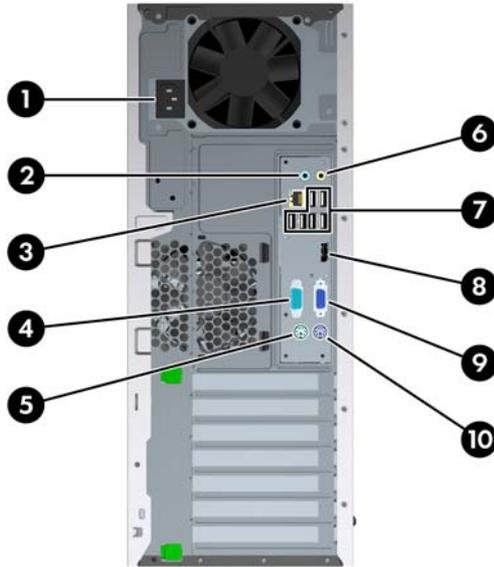
Table 1-3 Rear Panel Components

1		Power Cord Connector	6	↵♪	Line-Out Connector for powered audio devices (green)
2	→♪	Line-In Audio Connector (blue)	7	•⟍←	Universal Serial Bus (USB)
3	뮤뮤	RJ-45 Network Connector	8	‡ᴾ	DisplayPort Monitor Connector
4	IOIOI	Serial Connector	9	▭	VGA Monitor Connector
5	ᶀ	PS/2 Mouse Connector (green)	10	▦	PS/2 Keyboard Connector (purple)

NOTE: Arrangement and number of connectors may vary by model.

An optional second serial port and an optional parallel port are available from HP.

The Line-in audio connector can be retasked as a microphone connector in the audio driver's control panel.

The monitor connectors on the system board are inactive when a graphics card is installed in the computer.

If a graphics card is installed into the PCI, PCI Express x1, or the PCIe x16 slot that is downshifted to a x4 slot, the connectors on the graphics card and the system board may be used at the same time. Some settings may need to be changed in Computer Setup to use both connectors. For information about setting the boot VGA controller, refer to the *Computer Setup (F10) Utility Guide*.

Keyboard

Table 1-4 Keyboard Components

1	Function Keys	Perform special functions depending on the software application being used.
2	Editing Keys	Includes the following: Insert, Home, Page Up, Delete, End, and Page Down.
3	Status Lights	Indicate the status of the computer and keyboard settings (Num Lock, Caps Lock, and Scroll Lock).
4	Numeric Keys	Work like a calculator keypad.
5	Arrow Keys	Used to navigate through a document or Web site. These keys allow you to move left, right, up, and down, using the keyboard instead of the mouse.
6	Ctrl Keys	Used in combination with another key; their effect depends on the application software you are using.
7	Application Key[1]	Used (like the right mouse button) to open pop-up menus in a Microsoft Office application. May perform other functions in other software applications.
8	Windows Logo Keys[1]	Used to open the Start menu in Microsoft Windows. Used in combination with other keys to perform other functions.
9	Alt Keys	Used in combination with another key; their effect depends on the application software you are using.

[1] Keys available in select geographic regions.

Using the Windows Logo Key

Use the Windows Logo key in combination with other keys to perform certain functions available in the Windows operating system. Refer to Keyboard on page 5 to identify the Windows Logo key.

Table 1-5 **Windows Logo Key Functions**

The following Windows Logo Key functions are available in Microsoft Windows XP and Microsoft Windows Vista.	
Windows Logo Key	Displays or hides the Start menu
Windows Logo Key + d	Displays the Desktop
Windows Logo Key + m	Minimizes all open applications
Shift + Windows Logo Key + m	Undoes Minimize All
Windows Logo Key + e	Launches My Computer
Windows Logo Key + f	Launches Find Document
Windows Logo Key + Ctrl + f	Launches Find Computer
Windows Logo Key + F1	Launches Windows Help
Windows Logo Key + l	Locks the computer if you are connected to a network domain, or allows you to switch users if you are not connected to a network domain
Windows Logo Key + r	Launches the Run dialog box
Windows Logo Key + u	Launches the Utility Manager
Windows Logo Key + Pause/Break	Launches the System Properties dialog box
Windows Logo Key + Tab	Windows XP - Cycles through the Taskbar buttons
	Windows Vista - Cycles through programs on the Taskbar using the Windows Flip 3-D
In addition to the Windows Logo Key functions described above, the following functions are also available in Microsoft Windows Vista.	
Ctrl + Windows Logo Key + Tab	Use the arrow keys to cycle through programs on the Taskbar by using Windows Flip 3-D
Windows Logo Key + Spacebar	Brings all gadgets to the front and select Windows Sidebar
Windows Logo Key + g	Cycles through Sidebar gadgets
Windows Logo Key + u	Launches Ease of Access Center
Windows Logo Key + x	Launches Windows Mobility Center
Windows Logo Key + any number key	Launches the Quick Launch shortcut that is in the position that corresponds to the number (for example, Windows Logo Key + 1 launches the first shortcut in the Quick Launch menu)

Serial Number Location

Each computer has a unique serial number and a product ID number that are located on the top cover of the computer. Keep these numbers available for use when contacting customer service for assistance.

Figure 1-6 Serial Number and Product ID Location

2   Hardware Upgrades

Serviceability Features

The computer includes features that make it easy to upgrade and service. No tools are needed for most of the installation procedures described in this chapter.

Warnings and Cautions

Before performing upgrades be sure to carefully read all of the applicable instructions, cautions, and warnings in this guide.

⚠ **WARNING!**   To reduce the risk of personal injury from electrical shock, hot surfaces, or fire:

Disconnect the power cord from the wall outlet and allow the internal system components to cool before touching.

Do not plug telecommunications or telephone connectors into the network interface controller (NIC) receptacles.

Do not disable the power cord grounding plug. The grounding plug is an important safety feature.

Plug the power cord in a grounded (earthed) outlet that is easily accessible at all times.

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation, setup, posture, and health and work habits for computer users, and provides important electrical and mechanical safety information. This guide is located on the Web at http://www.hp.com/ergo.

WARNING!   Energized and moving parts inside.

Disconnect power to the equipment before removing the enclosure.

Replace and secure the enclosure before re-energizing the equipment.

△ **CAUTION:**   Static electricity can damage the electrical components of the computer or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See Appendix D, Electrostatic Discharge on page 57 for more information.

When the computer is plugged into an AC power source, voltage is always applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent damage to internal components.

Unlocking the Smart Cover Lock

The Smart Cover Lock is a software-controllable cover lock, controlled by the setup password. This lock prevents unauthorized access to the internal components. The computer ships with the Smart Cover Lock in the unlocked position. For more information about locking the Smart Cover Lock, refer to the *Desktop Management Guide*.

Smart Cover FailSafe Key

If you enable the Smart Cover Lock and cannot enter your password to disable the lock, you will need a Smart Cover FailSafe Key to open the computer cover. You will need the key to access the internal computer components in any of the following circumstances:

● Power outage

● Startup failure

● PC component (for example, processor or power supply) failure

● Forgotten password

NOTE: The Smart Cover FailSafe Key is a specialized tool available from HP. Be prepared; order this key before you need it.

To obtain a FailSafe Key:

● Contact an authorized HP reseller or service provider. Order PN 166527-001 for the wrench-style key or PN 166527-002 for the screwdriver bit key.

● Refer to the HP Web site (http://www.hp.com) for ordering information.

● Call the appropriate number listed in the warranty or in the *Support Telephone Numbers* guide.

Using the Smart Cover FailSafe Key to Remove the Smart Cover Lock

To open the access panel with the Smart Cover Lock engaged:

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

△ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Use the Smart Cover FailSafe Key to remove the two tamper-proof screws that secure the Smart Cover Lock to the chassis.

Figure 2-1 Removing the Smart Cover Lock Screws
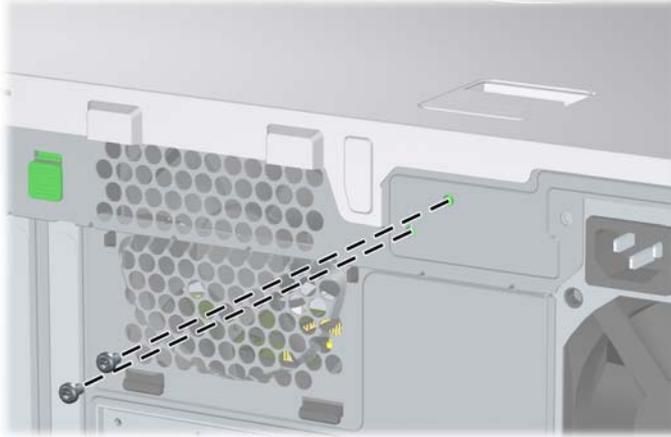
You can now remove the access panel. See Removing the Computer Access Panel on page 11.

To reattach the Smart Cover Lock, secure the lock in place with the tamper-proof screws.

Removing the Computer Access Panel

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

△ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Lay the computer down on its large base for greater stability.

6. Lift up on the access panel handle (1), slide the access panel back about 1.25 cm (1/2 inch), then lift it up and off the unit (2).
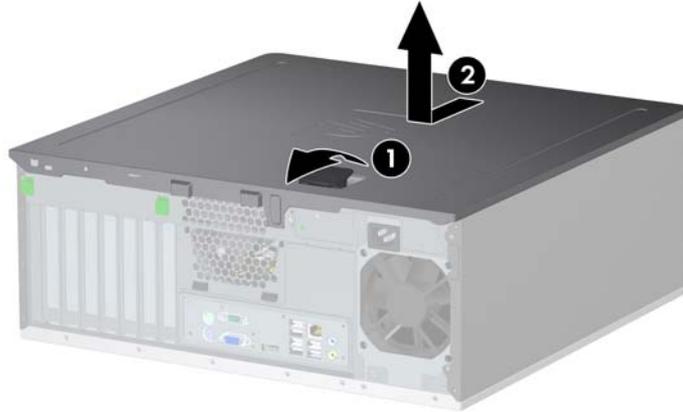
Figure 2-2 Removing the Computer Access Panel

Replacing the Computer Access Panel

1. Lay the computer down on its large base for greater stability.

2. Align the tabs on the access panel with the slots on the chassis and push down on the access panel while sliding it forward until it locks into place.

    Figure 2-3 Replacing the Computer Access Panel

Removing the Front Bezel

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

   △ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.

6. Push up on the two release tabs (1), then rotate the front bezel away from the chassis to release it (2).

   Figure 2-4 Removing the Front Bezel
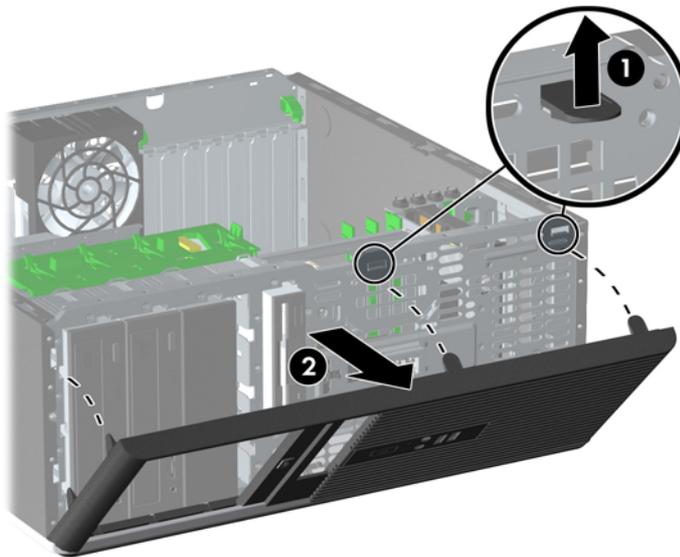
Replacing the Front Bezel

1. Place the bottom hinge points on the front bezel in their corresponding slots in the chassis (1).

2. Rotate the front bezel onto the chassis (2).

3. Snap the catches at the top of the bezel into place (3).

4. Snap the release tabs into place (4).

Figure 2-5 Replacing the Front Bezel
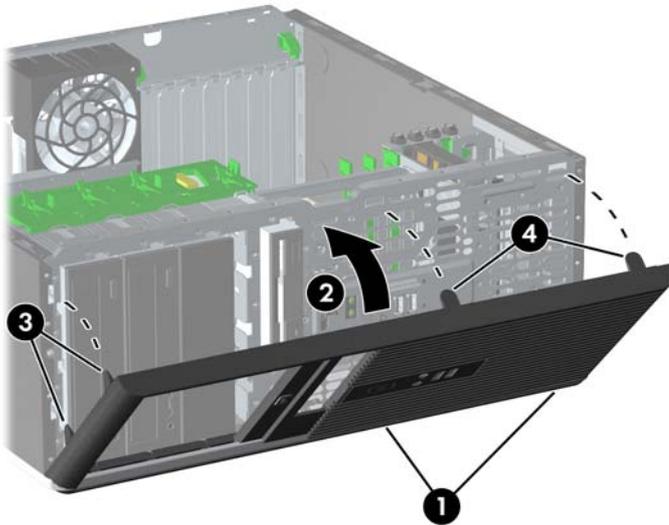
Removing Bezel Blanks

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

   △ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.

6. Remove the front bezel.

7. Gently pull the subpanel, with the bezel blanks secured in it, away from the front bezel, then remove the desired bezel blank.

△ **CAUTION:** Hold the subpanel straight when you pull it away from the front bezel. Pulling the subpanel away at an angle could damage the pins that align it within the front bezel.

Figure 2-6 Removing Bezel Blanks from the Subpanel (Desktop Shown)
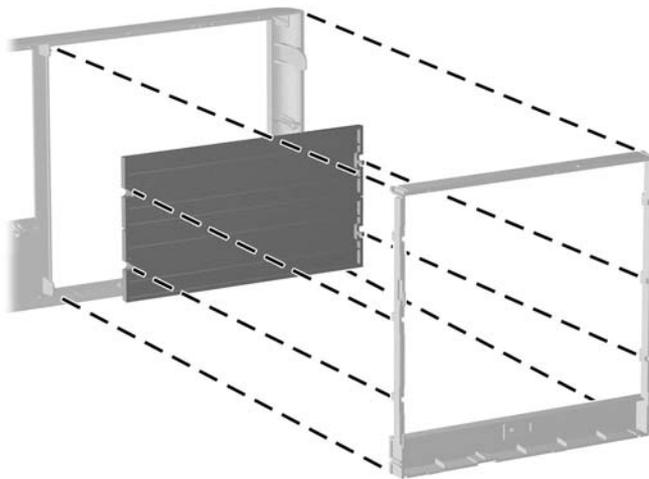
📝 **NOTE:** When replacing the subpanel, ensure that the aligning pins and any remaining bezel blanks are in their proper orientation. The logo on the subpanel should be located at the bottom of the subpanel when properly oriented.

Installing Additional Memory

The computer comes with double data rate 2 synchronous dynamic random access memory (DDR2-SDRAM) dual inline memory modules (DIMMs).

DIMMs

The memory sockets on the system board can be populated with up to four industry-standard DIMMs. These memory sockets are populated with at least one preinstalled DIMM. To achieve the maximum memory support, you can populate the system board with up to 16-GB of memory configured in a high-performing dual channel mode.

DDR2-SDRAM DIMMs

For proper system operation, the DDR2-SDRAM DIMMs must be:

- industry-standard 240-pin

- unbuffered PC2-6400 800 MHz-compliant

- 1.8 volt DDR2-SDRAM DIMMs

The DDR2-SDRAM DIMMs must also:

- support CAS latency 5 DDR2 800 Mhz (5-5-5 timing) and CAS latency 6 DDR2 800 Mhz (6-6-6 timing)

- contain the mandatory JEDEC SPD information

In addition, the computer supports:

- 512-Mbit and 1-Gbit non-ECC memory technologies

- single-sided and double-sided DIMMs

- DIMMs constructed with x8 and x16 DDR devices; DIMMs constructed with x4 SDRAM are not supported

NOTE: The system will not operate properly if you install unsupported DIMMs.

Populating DIMM Sockets

There are four DIMM sockets on the system board, with two sockets per channel. The sockets are labeled DIMM1, DIMM2, DIMM3, and DIMM4. Sockets DIMM1 and DIMM2 operate in memory channel A. Sockets DIMM3 and DIMM4 operate in memory channel B.

Figure 2-7 DIMM Socket Locations
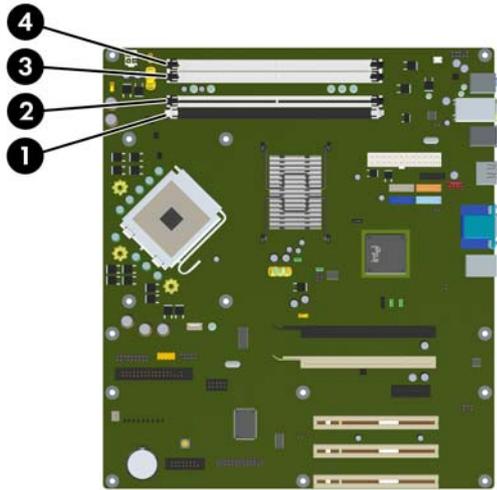
Table 2-1 DIMM Socket Locations

Item	Description	Socket Color
1	DIMM1 socket, Channel A	Black
2	DIMM2 socket, Channel A	White
3	DIMM3 socket, Channel B	White
4	DIMM4 socket, Channel B	White

NOTE: A DIMM must occupy the black DIMM1 socket. Otherwise, the system will display a POST error message indicating that a memory module must be installed in the black socket.

The system will automatically operate in single channel mode, dual channel mode, or flex mode, depending on how the DIMMs are installed.

- The system will operate in single channel mode if the DIMM sockets are populated in one channel only.

- The system will operate in a higher-performing dual channel mode if the total memory capacity of the DIMMs in Channel A is equal to the total memory capacity of the DIMMs in Channel B. The technology and device width can vary between the channels. For example, if Channel A is populated with two 512-MB DIMMs and Channel B is populated with one 1-GB DIMM, the system will operate in dual channel mode.

- The system will operate in flex mode if the total memory capacity of the DIMMs in Channel A is not equal to the total memory capacity of the DIMMs in Channel B. In flex mode, the channel populated with the least amount of memory describes the total amount of memory assigned to dual channel

and the remainder is assigned to single channel. For optimal speed, the channels should be balanced so that the largest amount of memory is spread between the two channels. If one channel will have more memory than the other, the larger amount should be assigned to Channel A. For example, if you are populating the sockets with one 1-GB DIMM, and three 512-MB DIMMs, Channel A should be populated with the 1-GB DIMM and one 512-MB DIMM, and Channel B should be populated with the two 512-MB DIMMs. With this configuration, 2-GB will run as dual channel and 512-MB will run as single channel.

- In any mode, the maximum operational speed is determined by the slowest DIMM in the system.

Installing DIMMs

△ **CAUTION:** You must disconnect the power cord before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

The memory module sockets have gold-plated metal contacts. When upgrading the memory, it is important to use memory modules with gold-plated metal contacts to prevent corrosion and/or oxidation resulting from having incompatible metals in contact with each other.

Static electricity can damage the electronic components of the computer or optional cards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. For more information, refer to Appendix D, Electrostatic Discharge on page 57.

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

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

△ **CAUTION:** You must disconnect the power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board.

5. Remove the computer access panel.

6. Locate the memory module sockets on the system board.

△ **WARNING!** To reduce risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

7. Open both latches of the memory module socket (1), and insert the memory module into the socket (2).

Figure 2-8 Installing a DIMM
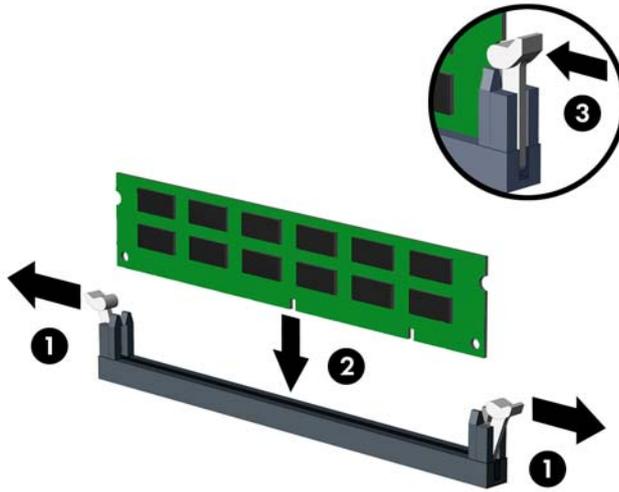
📝 **NOTE:** A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket.

A DIMM must occupy the black DIMM1 socket.

For maximum performance, populate the sockets so that the memory capacity is spread as equally as possible between Channel A and Channel B. Refer to Populating DIMM Sockets on page 17 for more information.

8. Push the module down into the socket, ensuring that the module is fully inserted and properly seated. Make sure the latches are in the closed position (3).

9. Repeat steps 7 and 8 to install any additional modules.

10. Replace the computer access panel.

11. Reconnect the power cord and turn on the computer.

12. Lock any security devices that were disengaged when the computer access panel was removed.

The computer should automatically recognize the additional memory the next time you turn on the computer.

Removing or Installing an Expansion Card

The computer has three standard full-height PCI expansion slots, one PCI Express x1 expansion slot, one PCI Express x16 expansion slot, and one PCI Express x16 expansion slot that is downshifted to a x4 slot.

Figure 2-9 Expansion Slot Locations
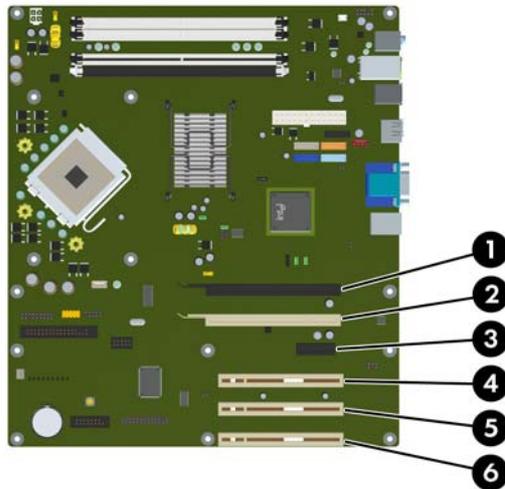
Table 2-2 Expansion Slot Locations

Item	Description
1	PCI Express x16 expansion slot
2	PCI Express x16 expansion slot that is downshifted to a x4 slot
3	PCI Express x1 expansion slot
4	PCI expansion slot
5	PCI expansion slot
6	PCI expansion slot

📝 **NOTE:** You can install a PCI Express x1, x8, or x16 expansion card in the PCI Express x16 slots.

For dual graphics card configurations, the first (primary) card must be installed in the PCI Express x16 slot that is NOT downshifted to a x4 slot.

To remove, replace, or add an expansion card:

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

$\triangle$ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.

6. Locate the correct vacant expansion socket on the system board and the corresponding expansion slot on the back of the computer chassis.

7. Press straight down on the two green thumb tabs inside the chassis (1) and rotate the expansion card retention latch up (2).

Figure 2-10 Opening the Expansion Slot Retainer
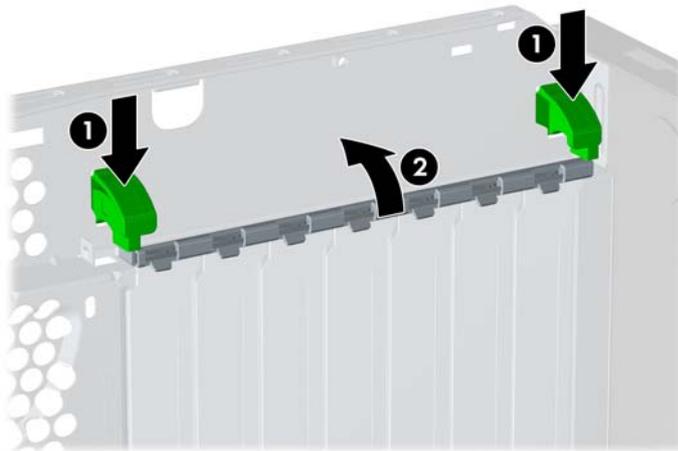
8. Before installing an expansion card, remove the expansion slot cover or the existing expansion card.

NOTE: Before removing an installed expansion card, disconnect any cables that may be attached to the expansion card.

a. If you are installing an expansion card in a vacant socket, remove the appropriate expansion slot cover on the back of the chassis. Lift the expansion slot cover from the expansion slot.

Figure 2-11 Removing an Expansion Slot Cover
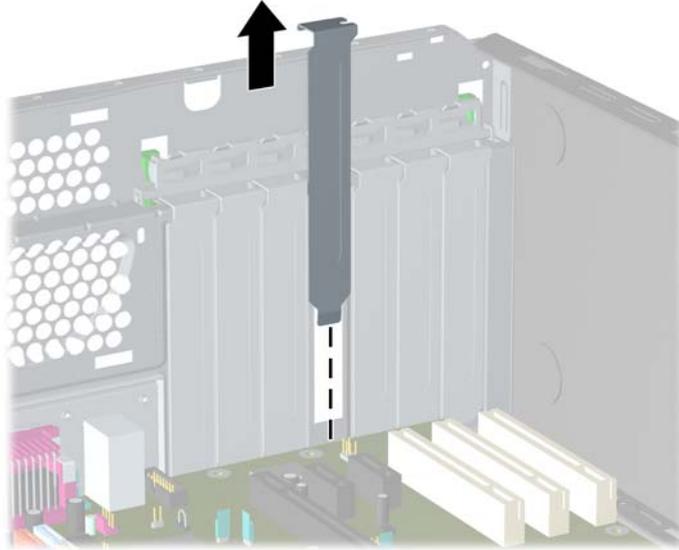
b. If you are removing a standard PCI card, hold the card at each end and carefully rock it back and forth until the connectors pull free from the socket. Lift the card straight up to remove it. Be sure not to scrape the card against other components.

Figure 2-12 Removing a Standard PCI Expansion Card
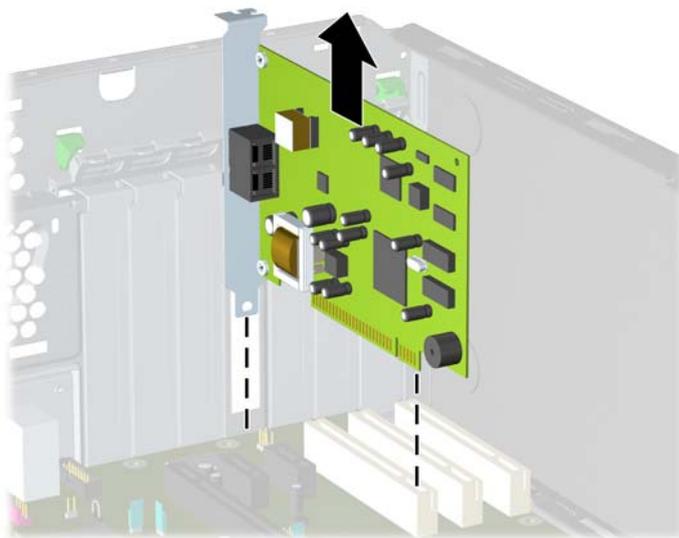
c. If you are removing a PCI Express x16 card, pull the retention arm on the back of the expansion socket away from the card and carefully rock the card back and forth until the connectors pull free from the socket. Lift the card straight up to remove it. Be sure not to scrape the card against other components.

Figure 2-13 Removing a PCI Express x16 Expansion Card
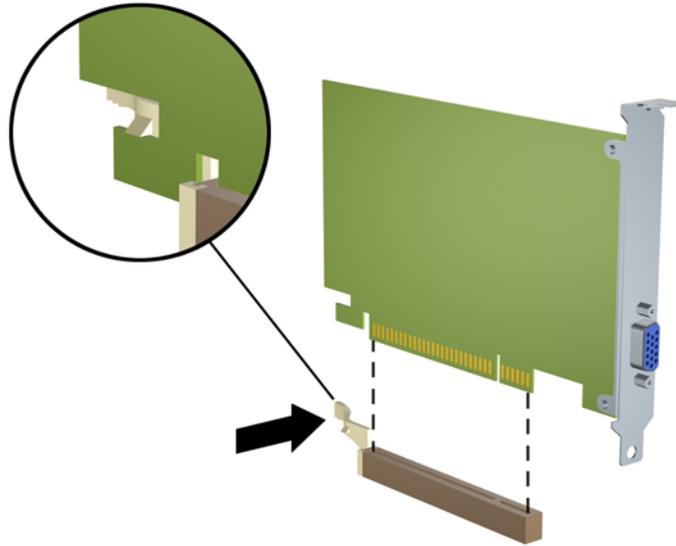
9. Store the removed card in anti-static packaging.

10. If you are not installing a new expansion card, install an expansion slot cover to close the open slot.

△ **CAUTION:** After removing an expansion card, you must replace it with a new card or expansion slot cover for proper cooling of internal components during operation.

11. To install a new expansion card, slide the bracket on the end of the card down into the slot on the back of the chassis and press the card down firmly into the socket on the system board.

Figure 2-14 Installing an Expansion Card
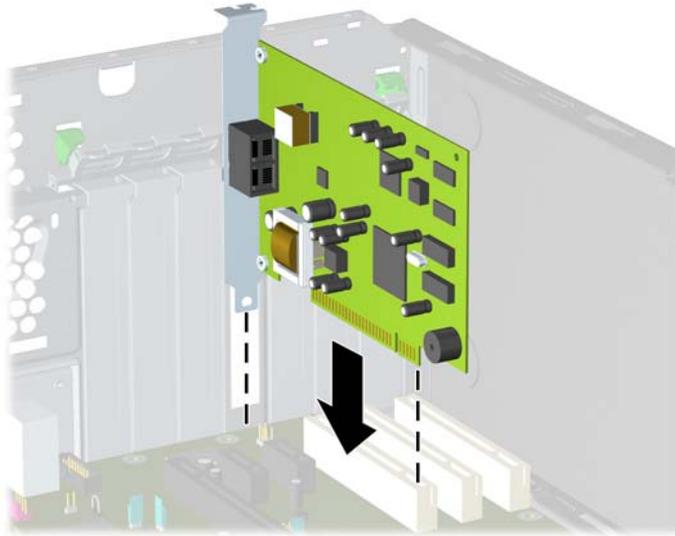
📝 **NOTE:** When installing an expansion card, press firmly on the card so that the whole connector seats properly in the expansion card slot.

12. Close the expansion card retention latch, making sure that it snaps firmly into place.

13. Connect external cables to the installed card, if needed. Connect internal cables to the system board, if needed.

14. Replace the computer access panel.

15. Reconnect the power cord and turn on the computer.

16. Lock any security devices that were disengaged when the computer access panel was removed.

17. Reconfigure the computer, if necessary. Refer to the *Computer Setup (F10) Utility Guide* for instructions on using Computer Setup.

Drive Positions

Figure 2-15 Desktop and Minitower Drive Positions
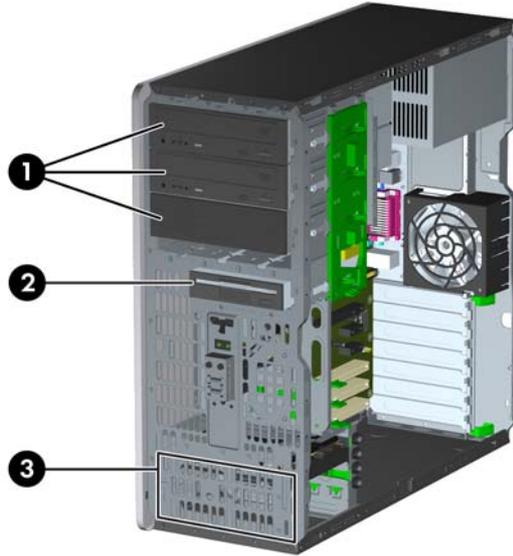
Table 2-3 Drive Positions

1	Three 5.25-inch external drive bays for optional drives (optical drives shown)[1]
2	One 3.5-inch external drive bay for optional drives (diskette drive shown)[2]
3	Two 3.5-inch internal hard drive bays

[1] An optional media card reader and an optional hard drive mounting bracket for these drive bays are available from HP. The bottom 5.25-inch drive bay has a shorter depth than the upper two bays. The bottom bay supports a half-height drive or other device that is no more than 14.5 cm (5.7 inches) in depth. Do not try to force a larger drive, such as an optical drive, into the bottom bay. This could cause damage to the drive and the system board. The use of unnecessary force when installing any drive into the drive bay may result in damage to the drive.

[2] Depending on the computer configuration, you may have a bezel blank in this position. If you do not have a drive in this slot, you may choose to install a 3.5-inch drive (such as a diskette drive, hard drive, or media card reader) later on.

To verify the type and size of the storage devices installed in the computer, run Computer Setup. Refer to the *Computer Setup (F10) Utility Guide* for more information.

Removing a Drive from a Drive Bay

△ **CAUTION:** All removable media should be taken out of a drive before removing the drive from the computer.

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

    △ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.

6. Disconnect the drive cables, as indicated in the following illustrations:

    △ **CAUTION:** When removing the cables, pull the tab or connector instead of the cable itself to avoid damaging the cable.

    ● If you are removing an optical drive, disconnect the power cable (1) and data cable (2) from the back of the drive.

    Figure 2-16 Disconnecting the Optical Drive Cables
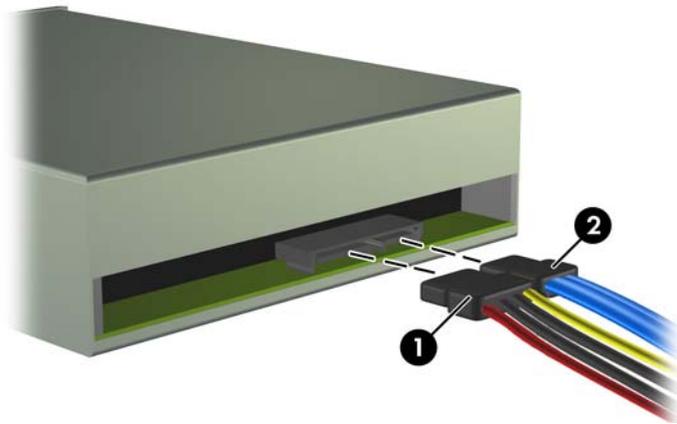
● If you are removing a diskette drive, disconnect the data cable (1) and power cable (2) from the back of the drive.

Figure 2-17 Disconnecting the Diskette Drive Cables
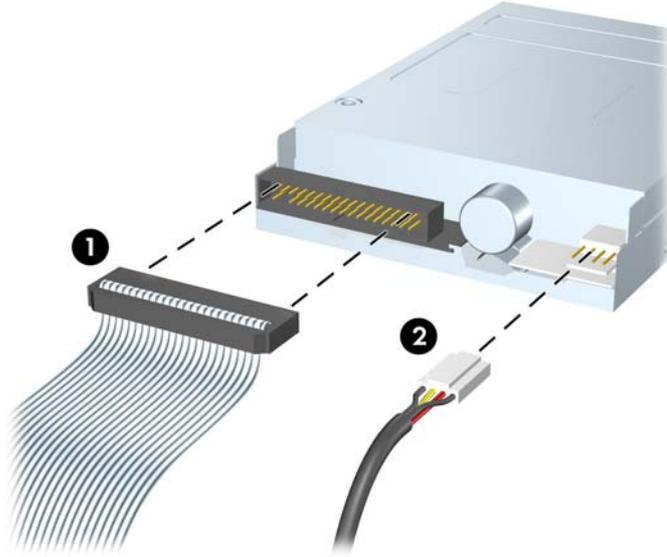
●   If you are removing a media card reader, disconnect the USB cable from the system board. If the media card reader has a 1394 port, disconnect the 1394 cable from the PCI card.

Figure 2-18 Disconnecting the Media Card Reader USB Cable
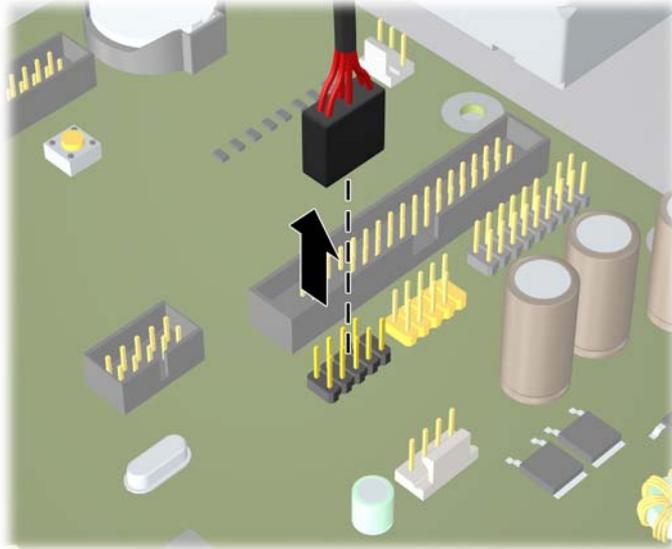
Figure 2-19 Disconnecting the Media Card Reader 1394 Cable
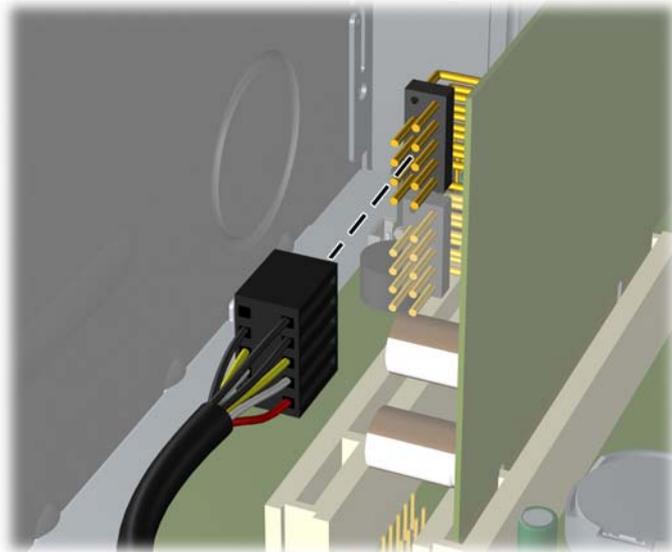
7. Remove the drive from the drive bay as follows:

- To remove a 5.25-inch drive in the desktop configuration, press down on the yellow drivelock mechanism (1) and slide the drive from the drive bay (2).

  △ **CAUTION:** When the yellow drivelock is pressed, all the external 5.25-inch drives are released so do not tilt the unit and allow the drives to fall out.

  Figure 2-20 Removing a 5.25-inch Drive in the Desktop Configuration (Optical Drive shown)
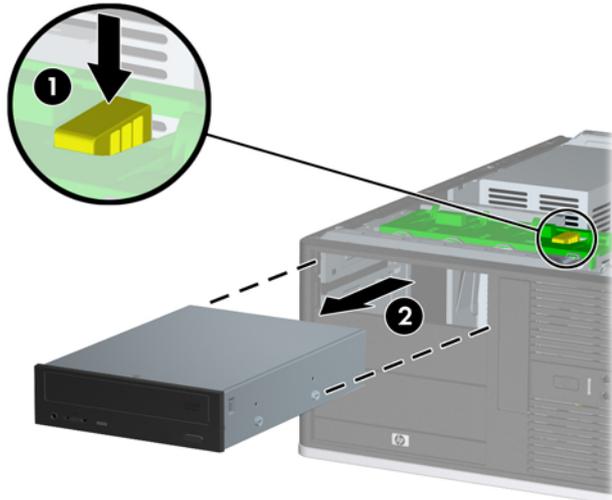
- To remove a 3.5-inch drive or a 5.25-inch drive in the minitower configuration, pull up on the green drivelock mechanism (1) for that specific drive and slide the drive from the drive bay (2).

  Figure 2-21 Removing a 3.5-inch Drive or a 5.25-inch Drive in the Minitower Configuration (Optical Drive shown)
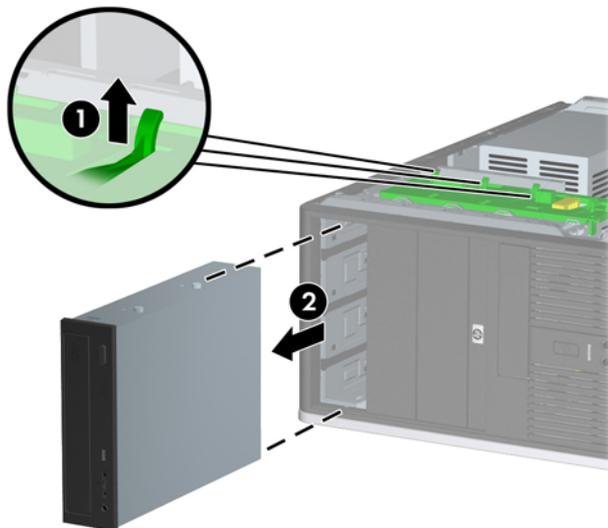
●   To remove a hard drive from and internal 3.5-inch drive bay, pull up on the green hard drive drivelock mechanism (1) for that drive and slide the drive from the drive bay (2).

Figure 2-22 Removing a Hard Drive
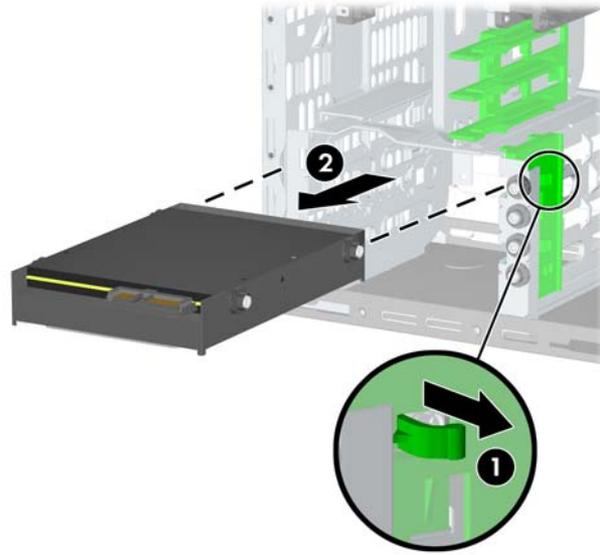
8.   Store the removed drive in anti-static packaging.

Installing Additional Drives

The computer supports up to five drives that may be installed in various configurations.

When installing additional drives, follow these guidelines:

- The primary Serial ATA (SATA) hard drive must be connected to the dark blue SATA connector on the system board labeled SATA0.

- Connect the first SATA optical drive to the white SATA connector on the system board labeled SATA1.

- Connect additional SATA drives to the next available (unpopulated) SATA connector on the system board in the following order: SATA0, SATA1, SATA2, SATA3.

- Always populate the dark blue SATA0 and white SATA1 connectors before the light blue SATA2 and orange SATA3 connectors.

- Connect an optional external eSATA drive to the black ESATA connector on the system board.

- Connect a diskette drive to the connector labeled FLOPPY.

- Connect a media card reader USB cable to the USB connector on the system board labeled MEDIA. If the media card reader has a 1394 port, connect the 1394 cable to the 1394 PCI card.

- The system does not support Parallel ATA (PATA) optical drives or PATA hard drives.

- You may install either a third-height or a half-height drive into a half-height bay.

- You must install guide screws to ensure the drive will line up correctly in the drive cage and lock in place. HP has provided extra guide screws installed on the chassis. The hard drive uses 6-32 isolation mounting guide screws, four of which are installed on the hard drive bracket under the access panel. All other drives use M3 metric screws, eight of which are installed on the diskette drive bracket under the access panel. The HP-supplied metric guide screws are black. The HP-supplied 6-32 isolation mounting guide screws are silver and blue.

Figure 2-23 Extra Hard Drive Isolation Mounting Guide Screws Location
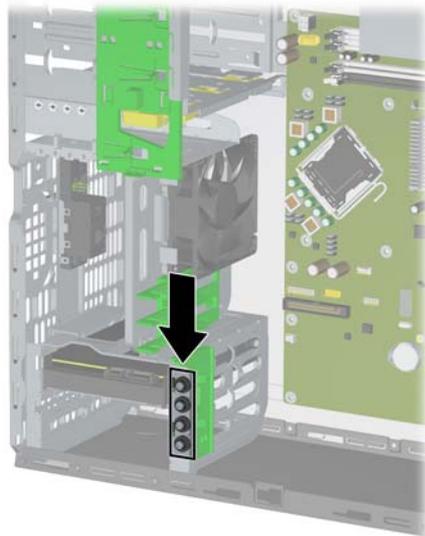
Figure 2-24 Extra Optical Drive M3 Guide Screws Location
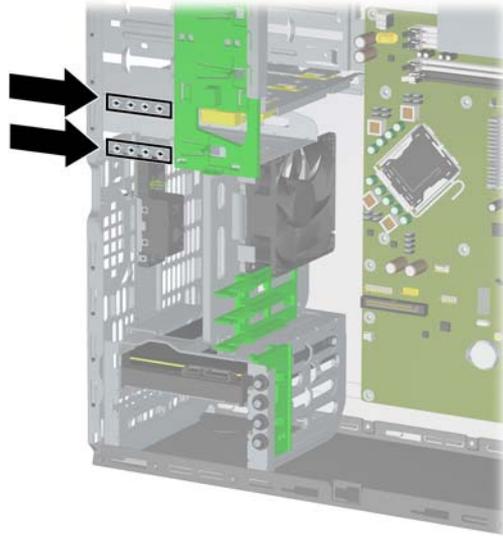
⚠ **CAUTION:** To prevent loss of work and damage to the computer or drive:

If you are inserting or removing a drive, shut down the operating system properly, turn off the computer, and unplug the power cord. Do not remove a drive while the computer is on or in standby mode.

Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector. For more information about preventing electrostatic damage, refer to Appendix D, Electrostatic Discharge on page 57.

Handle a drive carefully; do not drop it.

Do not use excessive force when inserting a drive.

Avoid exposing a hard drive to liquids, temperature extremes, or products that have magnetic fields such as monitors or speakers.

If a drive must be mailed, place the drive in a bubble-pack mailer or other protective packaging and label the package "Fragile: Handle With Care."

System Board Drive Connections

Refer to the following illustration and table to identify the system board drive connectors.

Figure 2-25 System Board Drive Connections
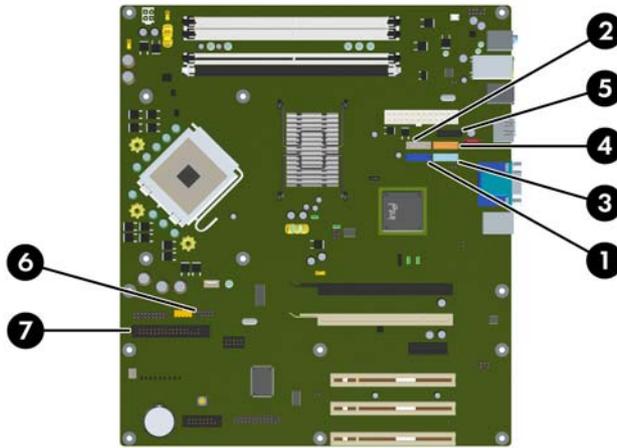
Table 2-4 System Board Drive Connections

No.	System Board Connector	System Board Label	Color
1	SATA0	SATA0	dark blue
2	SATA1	SATA1	white
3	SATA2	SATA2	light blue
4	SATA3	SATA3	orange
5	eSATA	ESATA	black
6	Media Card Reader	MEDIA	black
7	Diskette Drive	FLOPPY	black

Installing a 5.25-inch or 3.5-inch Drive into an External Drive Bay

NOTE: A 3.5-inch drive may be a diskette drive or a media card reader. A 5.25-inch drive may be an optical drive or a media card reader with a 5.25-inch adapter kit attached.

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

   CAUTION: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.

6. If you are installing a drive in a bay covered by a bezel blank, remove the front bezel then remove the bezel blank. See Removing Bezel Blanks on page 15 for more information.

7. Install two guide screws in the lower holes on each side of the drive (1).

   NOTE: Optical drives, diskette drives, and media card readers use M3 metric guide screws. Eight extra metric guide screws are provided on the diskette drive bracket under the access panel. The HP-supplied metric screws are black. Refer to Installing Additional Drives on page 31 for an illustration of the extra M3 metric guide screws location.

   If you are replacing a drive, transfer the guides screws from the old drive to the new one.

Figure 2-26 Installing a 5.25-Inch Drive in a Minitower (top) and Desktop (bottom)
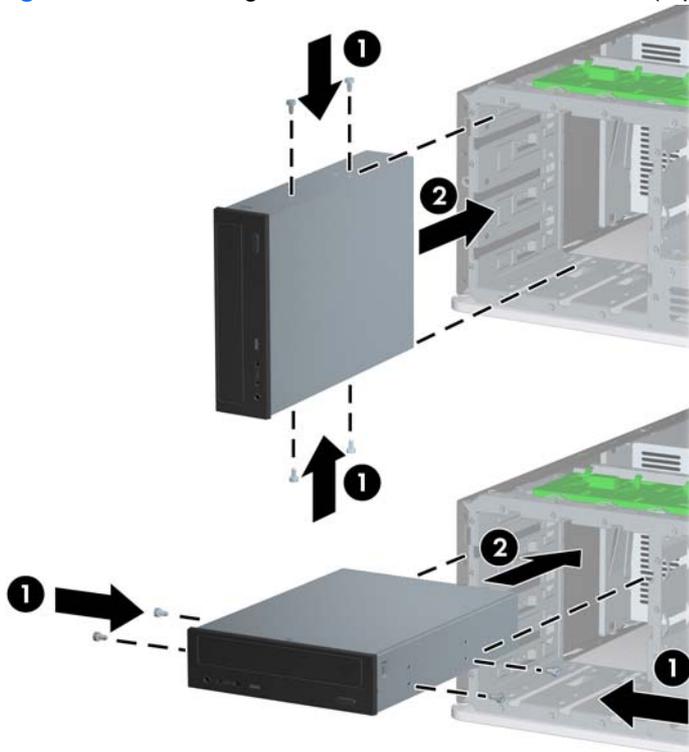
8. Install the drive in the desired drive bay by sliding it all the way into the front of the drive cage until it locks (2). The drivelock automatically secures the drive in the bay.

△ **CAUTION:** The bottom 5.25-inch drive bay has a shorter depth than the upper two bays. The bottom bay supports a half-height drive or other device that is no more than 14.5 cm (5.7 inches) in depth. Do not try to force a larger drive, such as an optical drive, into the bottom bay. This could cause damage to the drive and the system board. The use of unnecessary force when installing any drive into the drive bay may result in damage to the drive.

📝 **NOTE:** If you are installing a third optional drive, you may need to remove the strap that bundles the extra power connectors.

9. Connect the power cable (1) and data cable (2) to the rear of the optical drive or diskette drive.

Figure 2-27 Connecting the Drive Cables (Optical Drive shown)
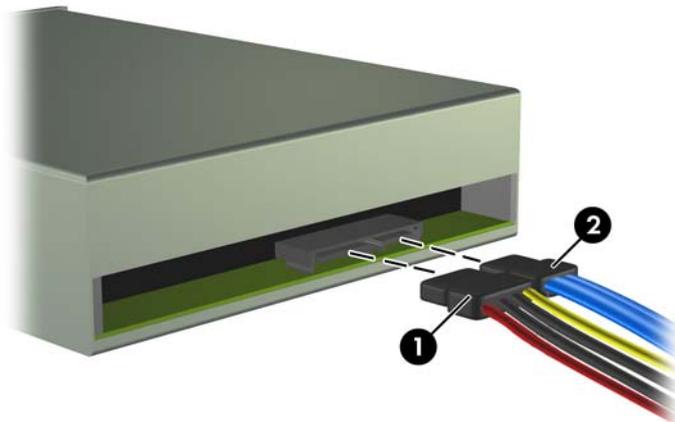
10. If you are installing a new drive, connect the opposite end of the data cable to the appropriate system board connector.

📝 **NOTE:** If you are installing a SATA optical drive, connect the first optical drive to the white SATA connector on the system board labeled SATA1. Connect a second optical drive to the next available (unpopulated) SATA connector following the numbered sequence of the connectors.

If you are installing a diskette drive, connect it to the connector on the system board labeled FLOPPY.

If your are installing a media card reader, connect the USB cable to the USB system board connector labeled MEDIA. If the media card reader includes a 1394 port, connect the 1394 cable to the 1394 PCI card.

11. Replace the front bezel and computer access panel.

12. Reconnect the power cord and turn on the computer.

13. Lock any security devices that were disengaged when the computer access panel was removed.

14. Reconfigure the computer, if necessary. Refer to the *Computer Setup (F10) Utility Guide* for instructions on using Computer Setup.

Installing a 3.5-inch SATA Hard Drive into an Internal Drive Bay

📝 **NOTE:** The system does not support Parallel ATA (PATA) hard drives.

Before you remove the old hard drive, be sure to back up the data from the old hard drive so that you can transfer the data to the new hard drive. Also, if you are replacing the primary hard drive, make sure you have created a Recovery Disc Set to restore the operating system, software drivers, and any software applications that were preinstalled on the computer. If you do not have this CD set, select **Start** > **HP Backup and Recovery** and create it now.

To install a hard drive in a 3.5-inch internal drive bay:

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

   △ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.

6. Install four 6-32 isolation mounting guide screws, two on each side of the drive.

   Figure 2-28 Installing the Hard Drive Guide Screws

   📝 **NOTE:** The hard drive uses 6-32 isolation mounting guide screws. Four extra guide screws are installed on the hard drive bracket under the access panel. The HP-supplied isolation mounting guide screws are silver and blue. Refer to Installing Additional Drives on page 31 for an illustration of the extra 6-32 isolation mounting guide screws location.

   If you are replacing a drive, transfer the guides screws from the old drive to the new one.

7. Slide the hard drive down into the drive cage until it locks. The drivelock automatically secures the drive in the bay.

Figure 2-29 Installing a Hard Drive into the Hard Drive Bay
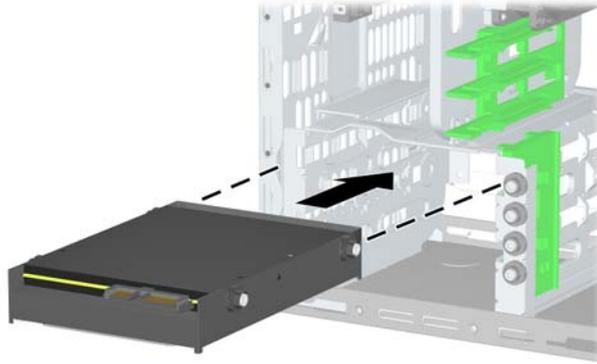
△ **CAUTION:** Make sure the guide screws line up with the guide slots in the drive cage. The use of unnecessary force when installing any drive into the drive bay may result in damage to the drive.

8. Connect the power cable (1) and data cable (2) to the rear of the hard drive.

Figure 2-30 Connecting the Power Cable and Data Cable to a SATA Hard Drive
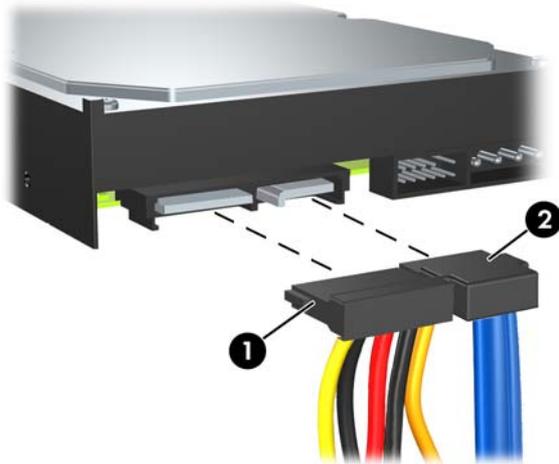
9. Connect the opposite end of the data cable to the appropriate system board connector.

📝 **NOTE:** If your system has only one SATA hard drive, you must connect the hard drive data cable to the dark blue connector labeled SATA0 to avoid any hard drive performance problems. If you are adding a second hard drive, connect the data cable to the next available (unpopulated) SATA connector on the system board in the following order: SATA0, SATA1, SATA2, SATA3.

10. Replace the computer access panel.

11. Reconnect the power cord and turn on the computer.

12. Lock any security devices that were disengaged when the computer access panel was removed.

13. Reconfigure the computer, if necessary. Refer to the *Computer Setup (F10) Utility Guide* for instructions on using Computer Setup.

Removing and Replacing a Removable 3.5-inch SATA Hard Drive

Some models are equipped with a Removable SATA Hard Drive Enclosure in the 5.25-inch external drive bay. The hard drive is housed in a carrier that can be quickly and easily removed from the drive bay. To remove and replace a drive in the carrier:

NOTE: Before you remove the old hard drive, be sure to back up the data from the old hard drive so that you can transfer the data to the new hard drive. Also, if you are replacing the primary hard drive, make sure you have created a Recovery Disc Set to restore the operating system, software drivers, and any software applications that were preinstalled on the computer. If you do not have this CD set, select **Start** > **HP Backup and Recovery** and create it now.

1. Unlock the hard drive carrier with the key provided and slide the carrier out of the enclosure.

2. Remove the screw from the rear of the carrier (1) and slide the top cover off the carrier (2).

Figure 2-31 Removing the Carrier Cover

3. Remove the adhesive strip that secures the thermal sensor to the top of the hard drive (1) and move the thermal sensor away from the carrier (2).

Figure 2-32 Removing the Thermal Sensor
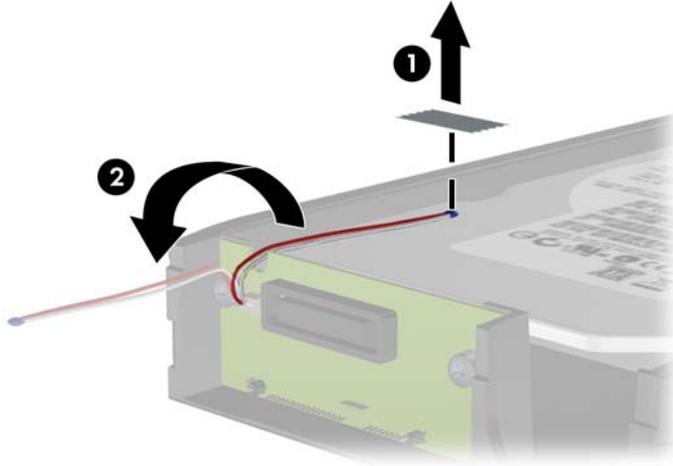
4. Remove the four screws from the bottom of the hard drive carrier.

Figure 2-33 Removing the Security Screws
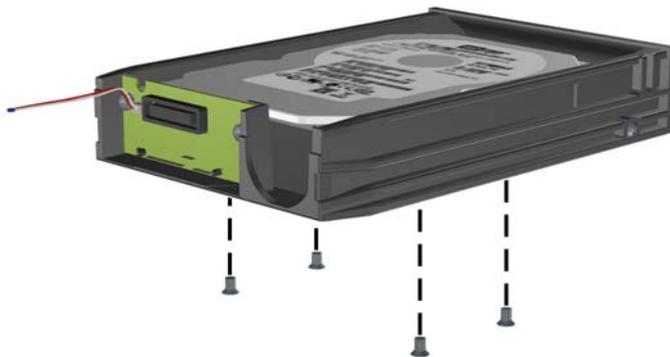
5. Slide the hard drive back to disconnect it from the carrier then lift it up and out of the carrier.

    Figure 2-34 Removing the Hard Drive
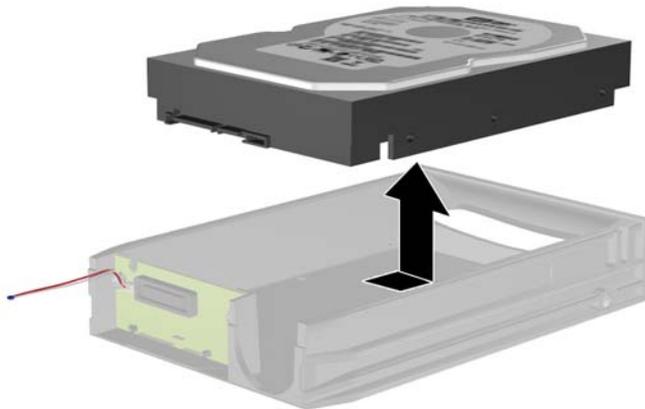
6. Place the new hard drive in the carrier then slide the hard drive back so that it seats in the SATA connector on the carrier's circuit board. Be sure the connector on the hard drive is pressed all the way into the connector on the carrier's circuit board.

    Figure 2-35 Replacing the Hard Drive
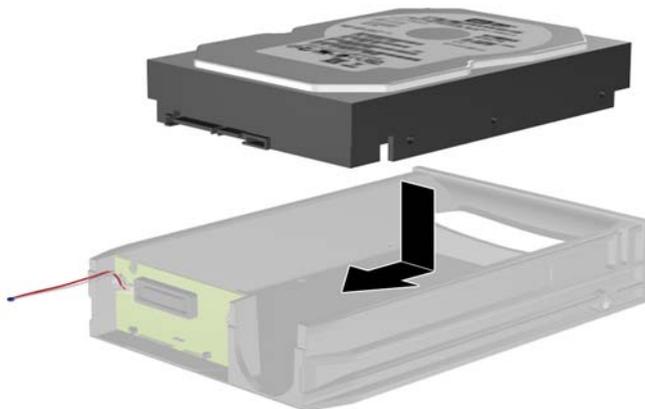
7. Replace the four screws in the bottom of the carrier to hold the drive securely in place.

Figure 2-36 Replacing the Security Screws
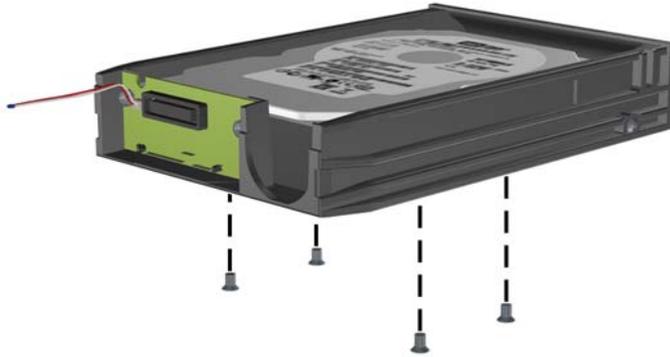
8. Place the thermal sensor on top of the hard drive in a position that does not cover the label (1) and attach the thermal sensor to the top of the hard drive with the adhesive strip (2).

Figure 2-37 Replacing the Thermal Sensor
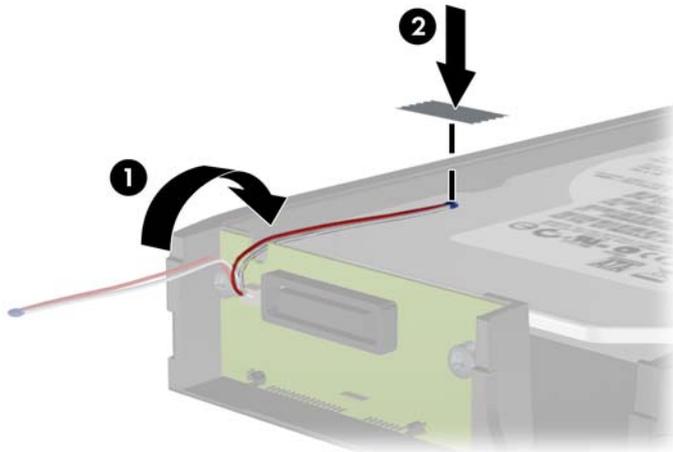
9. Slide the cover on the carrier (1) and replace the screw on the rear of the carrier to secure the cover in place (2).

    Figure 2-38 Replacing the Carrier Cover
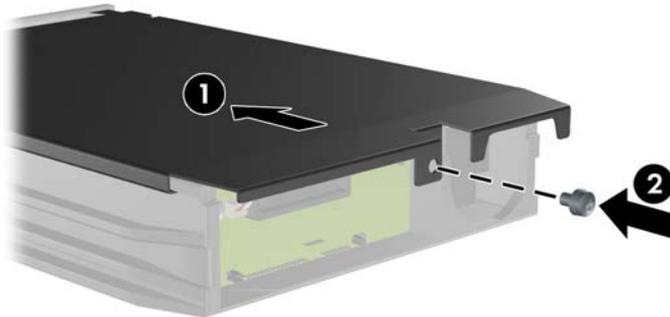
10. Slide the hard drive carrier into the enclosure on the computer and lock it with the key provided.

    NOTE: The carrier must be locked for power to be supplied to the hard drive.

Changing from a Minitower to a Desktop Configuration

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

    △ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.

6. Remove the front bezel.

7. Disconnect all power and data cables from the back of the drives in the 5.25-inch drive bays.

8. To release the drives from the 5.25-inch drive bay, lift the release tab on the green latch drive bracket for the drive. While lifting the release tab, slide the drive from its drive bay. Repeat this step for each 5.25-inch drive.

    Figure 2-39 Releasing the 5.25-inch Drives from the Drive Bays (Minitower)
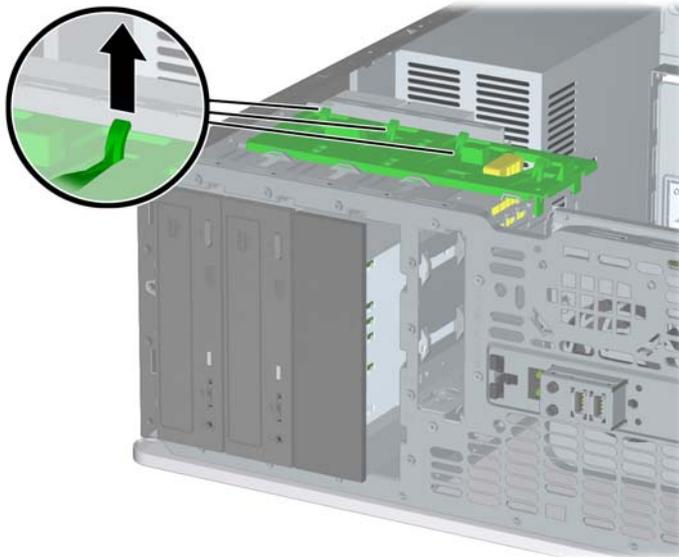
9. Before you reinstall each drive into the chassis, turn the drive so that it is perpendicular to the internal 3.5-inch drive. The drive should be parallel to the green latch drive bracket.

Figure 2-40 Installing a Drive in the Desktop Configuration

10. Gently slide the drive into the uppermost available bay until it snaps into place. When the drive is properly inserted, the drivelock will secure it. Repeat this step for each drive.

△ **CAUTION:** The bottom 5.25-inch drive bay has a shorter depth than the upper two bays. The bottom bay supports a half-height drive or other device that is no more than 14.5 cm (5.7 inches) in depth. Do not try to force a larger drive, such as an optical drive, into the bottom bay. This could cause damage to the drive and the system board. The use of unnecessary force when installing any drive into the drive bay may result in damage to the drive.

11. Reconnect all power and data cables to the drives in the 5.25-inch drive bays.

12. Remove the bezel subpanel as described in Removing Bezel Blanks on page 15.

△ **CAUTION:** Hold the subpanel straight when you pull it away from the front bezel. Pulling the subpanel away at an angle could damage the pins that align it within the front bezel.

13. Reposition the bezel blanks within the subpanel in the proper orientation for the desktop configuration.

14. Reposition the subpanel (rotate it 90º) with the logo at the bottom, then snap it back into the bezel.

Figure 2-41 Changing from a Minitower to a Desktop Configuration
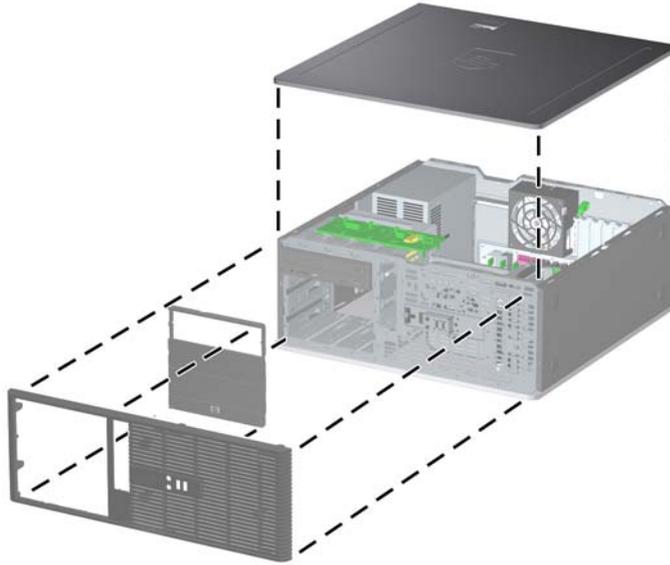
15. Replace the front bezel and computer access panel.

16. Reconnect the power cord and turn on the computer.

17. Lock any security devices that were disengaged when the computer access panel was removed.

Changing from a Desktop to a MinitowerConfiguration

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

△ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.

6. Remove the front bezel.

7. Disconnect all power and data cables from the back of the drives in the 5.25-inch drive bays.

8. To release the drives from the 5.25-inch drive bay, press down on the short yellow drivelock as shown. While pressing the drivelock, pull the drives out of the drive bay.

Figure 2-42 Releasing the 5.25-inch Drives from the Drive Bays (Desktop)

9. Before you reinstall each drive into the chassis, turn it so that it is in the same orientation as the internal 3.5-inch drive. The bottom of the drive should be parallel to the yellow drivelock.

Figure 2-43 Installing a Drive in the Minitower Configuration

10. Gently slide the drive into the uppermost available bay until it snaps into place. When the drive is properly inserted, the drivelock will secure it. Repeat this step for each drive.

△ **CAUTION:** The bottom 5.25-inch drive bay has a shorter depth than the upper two bays. The bottom bay supports a half-height drive or other device that is no more than 14.5 cm (5.7 inches) in depth. Do not try to force a larger drive, such as an optical drive, into the bottom bay. This could cause damage to the drive and the system board. The use of unnecessary force when installing any drive into the drive bay may result in damage to the drive.

11. Reconnect all power and data cables to the drives in the 5.25-inch drive bays.

12. Remove the bezel subpanel as described in the Removing Bezel Blanks on page 15 section.

△ **CAUTION:** Hold the subpanel straight when you pull it away from the front bezel. Pulling the subpanel away at an angle could damage the pins that align it within the front bezel.

13. Reposition the bezel blanks within the subpanel in the proper orientation for the minitower configuration.

14. Reposition the subpanel (rotate it 90º) with the logo at the bottom, then snap it back into the bezel.

Figure 2-44 Changing from a Desktop to a Minitower Configuration
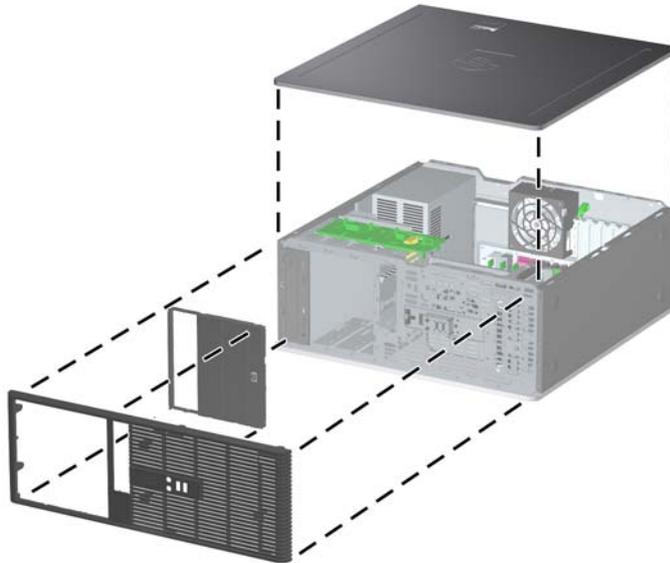
15. Replace the front bezel and computer access panel.

16. Reconnect the power cord and turn on the computer.

17. Lock any security devices that were disengaged when the computer access panel was removed.

A Specifications

Table A-1 Specifications

Desktop Dimensions		
Height	7.0 in	17.8 cm
Width	17.63 in	44.8 cm
Depth	17.8 in	45.2 cm
Tower Dimensions		
Height	17.63 in	44.8 cm
Width	7.0 in	17.8 cm
Depth	17.8 in	45.2 cm
Approximate Weight	26.4 lb	12.0 kg
Weight Supported (maximum distributed load in desktop position)	77 lb	35 kg
Temperature Range		
Operating	50° to 95°F	10° to 35°C
Nonoperating	-22° to 140°F	-30° to 60°C

NOTE: Operating temperature is derated 1.0° C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level; no direct sustained sunlight. Maximum rate of change is 10° C/Hr. The upper limit may be limited by the type and number of options installed.

Relative Humidity (noncondensing)		
Operating	10-90%	10-90%
Nonoperating (38.7°C max wet bulb)	5-95%	5-95%
Maximum Altitude (unpressurized)		
Operating	10,000 ft	3048 m
Nonoperating	30,000 ft	9144 m
Heat Dissipation		
Maximum (standard PS)	1,916 BTU/hr	483 kg-cal/hr
Typical (idle; standard PS)	307 BTU/hr	77 kg-cal/hr
Maximum (85% Efficient PS)	1519 BTU/hr	383 kg-cal/hr
Typical (idle; 85% Efficient PS)	239 BTU/hr	60 kg-cal/hr

Table A-1 Specifications (continued)

Power Supply	115V	230V
Operating Voltage Range[1]	90-264 VAC	90-264 VAC
Rated Voltage Range	100-240 VAC	100-240 VAC
Rated Line Frequency	50-60 Hz	50-60 Hz
Power Output	365 W	365 W
Rated Input Current (maximum)[1]		
Standard PS	6A @ 100 VAC	3A @ 200 VAC
85% Efficient PS	5A @ 100VAC	2.5A @ 200VAC

[1] This system utilizes an active power factor corrected power supply. This allows the system to pass the CE mark requirements for use in the countries of the European Union. The active power factor corrected power supply also has the added benefit of not requiring an input voltage range select switch.

B Battery Replacement

The battery that comes with the computer provides power to the real-time clock. When replacing the battery, use a battery equivalent to the battery originally installed in the computer. The computer comes with a 3-volt lithium coin cell battery.

WARNING! The computer contains an internal lithium manganese dioxide battery. There is a risk of fire and burns if the battery is not handled properly. To reduce the risk of personal injury:

Do not attempt to recharge the battery.

Do not expose to temperatures higher than 60°C (140ºF).

Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.

Replace the battery only with the HP spare designated for this product.

CAUTION: Before replacing the battery, it is important to back up the computer CMOS settings. When the battery is removed or replaced, the CMOS settings will be cleared. Refer to the *Computer Setup (F10) Utility Guide* for information on backing up the CMOS settings.

Static electricity can damage the electronic components of the computer or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

NOTE: The lifetime of the lithium battery can be extended by plugging the computer into a live AC wall socket. The lithium battery is only used when the computer is NOT connected to AC power.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, go to http://www.hp.com/recycle.

1. Remove/disengage any security devices that prohibit opening the computer.

2. Remove all removable media, such as diskettes or compact discs, from the computer.

3. Turn off the computer properly through the operating system, then turn off any external devices.

4. Disconnect the power cord from the power outlet and disconnect any external devices.

   CAUTION: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.

6. Locate the battery and battery holder on the system board.

NOTE: On some computer models, it may be necessary to remove an internal component to gain access to the battery.

7. Depending on the type of battery holder on the system board, complete the following instructions to replace the battery.

Type 1

a. Lift the battery out of its holder.

Figure B-1 Removing a Coin Cell Battery (Type 1)
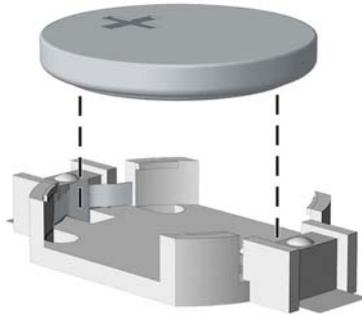
b. Slide the replacement battery into position, positive side up. The battery holder automatically secures the battery in the proper position.

Type 2

a. To release the battery from its holder, squeeze the metal clamp that extends above one edge of the battery. When the battery pops up, lift it out (1).

b. To insert the new battery, slide one edge of the replacement battery under the holder's lip with the positive side up. Push the other edge down until the clamp snaps over the other edge of the battery (2).

Figure B-2 Removing and Replacing a Coin Cell Battery (Type 2)
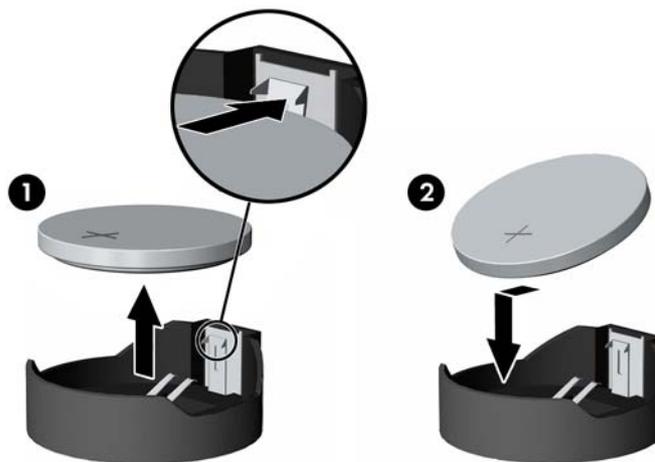
Type 3

a. Pull back on the clip (1) that is holding the battery in place, and remove the battery (2).

b. Insert the new battery and position the clip back into place.

Figure B-3 Removing a Coin Cell Battery (Type 3)
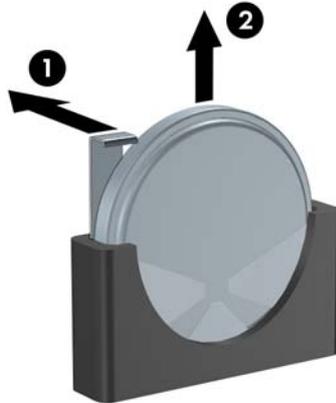
📝 **NOTE:** After the battery has been replaced, use the following steps to complete this procedure.

8. Replace the computer access panel.

9. Plug in the computer and turn on power to the computer.

10. Reset the date and time, your passwords, and any special system setups using Computer Setup. Refer to the *Computer Setup (F10) Utility Guide*.

11. Lock any security devices that were disengaged when the computer access panel was removed.

C External Security Devices

Installing a Security Lock

The security locks displayed below and on the following page can be used to secure the computer.

Cable Lock

Figure C-1 Installing a Cable Lock

Padlock

Figure C-2 Installing a Padlock

HP Business PC Security Lock

1. Fasten the security cable by looping it around a stationary object.

   Figure C-3 Securing the Cable to a Fixed Object

2. Thread the keyboard and mouse cables through the lock.

   **Figure C-4** Threading the Keyboard and Mouse Cables

3. Screw the lock to the chassis using the screw provided.

Figure C-5 Attaching the Lock to the Chassis

4. Insert the plug end of the security cable into the lock (1) and push the button in (2) to engage the lock. Use the key provided to disengage the lock.

Figure C-6 Engaging the Lock
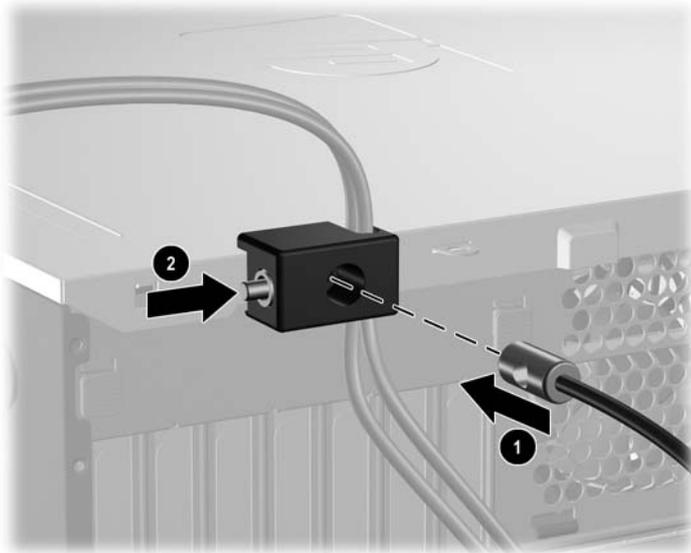
D   Electrostatic Discharge

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Damage

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.

- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.

- Place parts on a grounded surface before removing them from their containers.

- Avoid touching pins, leads, or circuitry.

- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm +/- 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

- Use heelstraps, toestraps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

- Use conductive field service tools.

- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, contact an HP authorized dealer, reseller, or service provider.

NOTE: For more information on static electricity, contact an HP authorized dealer, reseller, or service provider.

E Computer Operating Guidelines, Routine Care and Shipping Preparation

Computer Operating Guidelines and Routine Care

Follow these guidelines to properly set up and care for the computer and monitor:

- Keep the computer away from excessive moisture, direct sunlight, and extremes of heat and cold.

- Operate the computer on a sturdy, level surface. Leave a 10.2-cm (4-inch) clearance on all vented sides of the computer and above the monitor to permit the required airflow.

- Never restrict the airflow into the computer by blocking any vents or air intakes. Do not place the keyboard, with the keyboard feet down, directly against the front of the desktop unit as this also restricts airflow.

- Never operate the computer with the access panel or any of the expansion card slot covers removed.

- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.

- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.

- Keep liquids away from the computer and keyboard.

- Never cover the ventilation slots on the monitor with any type of material.

- Install or enable power management functions of the operating system or other software, including sleep states.

- Turn off the computer before you do either of the following:

  ○ Wipe the exterior of the computer with a soft, damp cloth as needed. Using cleaning products may discolor or damage the finish.

  ○ Occasionally clean the air vents on all vented sides of the computer. Lint, dust, and other foreign matter can block the vents and limit the airflow.

Optical Drive Precautions

Be sure to observe the following guidelines while operating or cleaning the optical drive.

Operation

- Do not move the drive during operation. This may cause it to malfunction during reading.

- Avoid exposing the drive to sudden changes in temperature, as condensation may form inside the unit. If the temperature suddenly changes while the drive is on, wait at least one hour before you turn off the power. If you operate the unit immediately, it may malfunction while reading.

- Avoid placing the drive in a location that is subject to high humidity, extreme temperatures, mechanical vibration, or direct sunlight.

Cleaning

- Clean the panel and controls with a soft, dry cloth or a soft cloth lightly moistened with a mild detergent solution. Never spray cleaning fluids directly on the unit.

- Avoid using any type of solvent, such as alcohol or benzene, which may damage the finish.

Safety

If any object or liquid falls into the drive, immediately unplug the computer and have it checked by an authorized HP service provider.

Shipping Preparation

Follow these suggestions when preparing to ship the computer:

1. Back up the hard drive files on PD discs, tape cartridges, CDs, or diskettes. Be sure that the backup media is not exposed to electrical or magnetic impulses while stored or in transit.

   NOTE: The hard drive locks automatically when the system power is turned off.

2. Remove and store all removable media.

3. Insert a blank diskette into the diskette drive to protect the drive while in transit. Do not use a diskette on which you have stored or plan to store data.

4. Turn off the computer and external devices.

5. Disconnect the power cord from the electrical outlet, then from the computer.

6. Disconnect the system components and external devices from their power sources, then from the computer.

   NOTE: Ensure that all boards are seated properly and secured in the board slots before shipping the computer.

7. Pack the system components and external devices in their original packing boxes or similar packaging with sufficient packing material to protect them.

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