



# **Hardware Reference Guide**

HP Compaq Business PC

dc7600 Convertible Minitower

Document Part Number: 384568-001

**May 2005**

This guide provides basic information for upgrading this computer model.

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directions could result in damage to equipment or loss of information.

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## **Hardware Reference Guide**

HP Compaq Business PC  
dc7600 Convertible Minitower

First Edition (May 2005)

Document Part Number: 384568-001

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## Product Features

### Standard Configuration Features

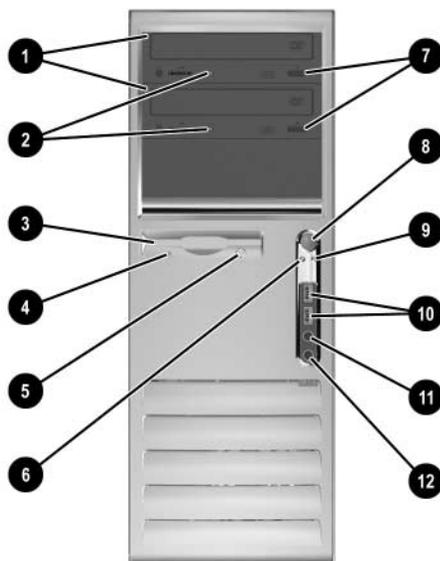
The HP Compaq Convertible Minitower computer can be easily converted to a desktop. Features may vary depending on the model. For a complete listing of the hardware and software installed in the computer, run the diagnostic utility (included on some computer models only). Instructions for using the utility are provided in the *Troubleshooting Guide* on the *Documentation and Diagnostics CD*.



*Convertible Minitower Configuration*

## Front Panel Components

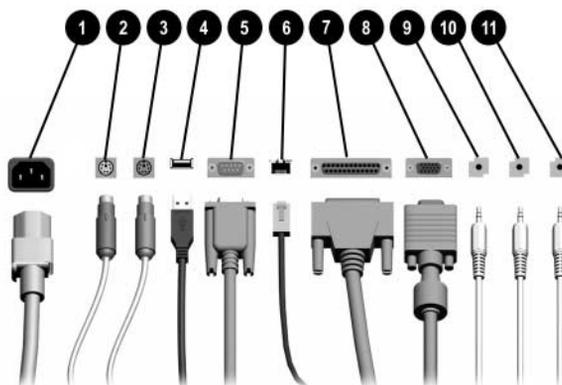
Drive configuration may vary by model.



### Front Panel Components

❶	Optical Drives	❷	Optical Drive Eject Buttons
❸	Optical Drive Activity Lights	❸	Dual-State Power Button
❹	Diskette Drive (optional)	❹	Power On Light
❺	Diskette Drive Activity Light (optional)	❺	USB (Universal Serial Bus) Ports
❻	Diskette Eject Button (optional)	❻	Headphone Connector
❼	Hard Drive Activity Light	❼	Microphone Connector
	An optical drive is a CD-ROM, CD-R/RW, DVD-ROM, DVD+R/RW, or CD-RW/DVD Combo drive.		

## Rear Panel Components



### Rear Panel Components

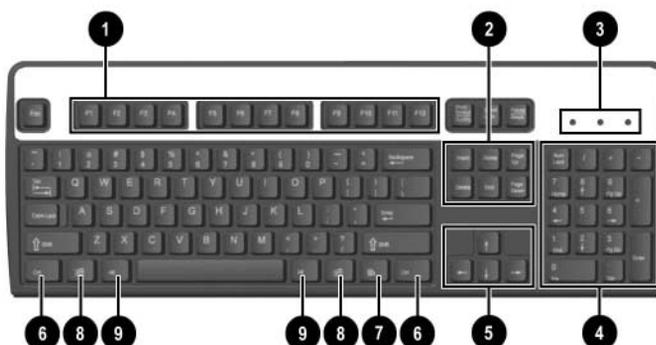
❶	Power Cord Connector	❷	Parallel Connector
❸	PS/2 Mouse Connector (green)	❸	Monitor Connector
❹	PS/2 Keyboard Connector (purple)	❹	Line-Out Connector for powered audio devices (green)
❺	Universal Serial Bus (USB)	❺	Line-In Audio Connector (blue)
❻	Serial Connector	❻	Microphone Connector (pink)
❼	RJ-45 Network Connector		

 Arrangement and number of connectors may vary by model.

The monitor connector on the system board is inactive when a PCI Express graphics card is installed in the computer.

If an ADD2 graphics card is installed, the connectors on the 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 Boot Order, refer to the *Computer Setup (F10) Utility Guide* on the *Documentation and Diagnostics CD*.

# Keyboard



## Keyboard Components

❶	Function Keys	Perform special functions depending on the software application being used.
❷	Editing Keys	Includes the following: Insert, Home, Page Up, Delete, End, and Page Down.
❸	Status Lights	Indicate the status of the computer and keyboard settings (Num Lock, Caps Lock, and Scroll Lock).
❹	Numeric Keys	Work like a calculator keypad.
❺	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.
❻	Ctrl Keys	Used in combination with another key; its effect depends on the application software you are using.
❼	Application Key*	Used (like the right mouse button) to open pop-up menus in a Microsoft Office application. May perform other functions in other software applications.
❽	Windows Logo Keys*	Used to open the Start menu in Microsoft Windows. Used in combination with other keys to perform other functions.
❾	Alt Keys	Used in combination with another key; its effect depends on the application software you are using.

\*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 the “[Keyboard](#)” section to identify the Windows Logo key.

Windows Logo Key	Displays or hides the Start menu
Windows Logo Key + <b>d</b>	Displays the Desktop
Windows Logo Key + <b>m</b>	Minimizes all open applications
<b>Shift</b> + Windows Logo Key + <b>m</b>	Undoes Minimize All
Windows Logo Key + <b>e</b>	Launches My Computer
Windows Logo Key + <b>f</b>	Launches Find Document
Windows Logo Key + <b>Ctrl</b> + <b>f</b>	Launches Find Computer
Windows Logo Key + <b>F1</b>	Launches Windows Help
Windows Logo Key + <b>l</b>	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 + <b>r</b>	Launches the Run dialog box
Windows Logo Key + <b>u</b>	Launches the Utility Manager
Windows Logo Key + <b>Tab</b>	Activates the next Taskbar button

## Special Mouse Functions

Most software applications support the use of a mouse. The functions assigned to each mouse button depend on the software applications you are using.

## Serial Number Location

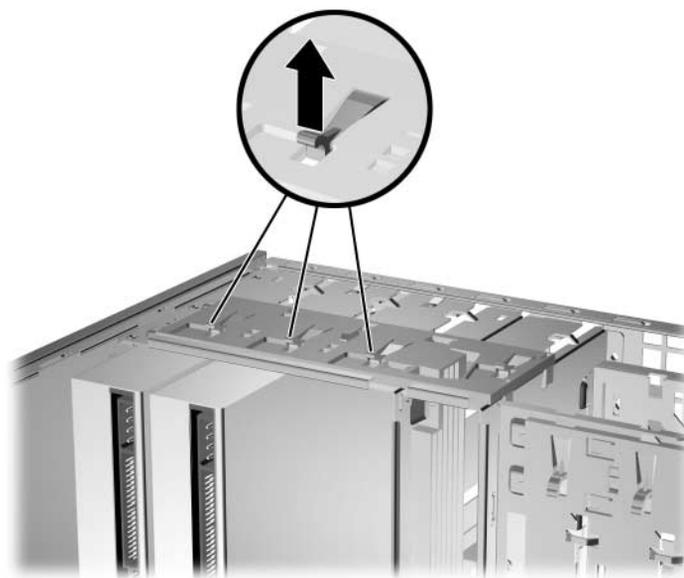
Each computer has a unique serial number and a product ID number that are located on the top cover of the computer. Keep these numbers available for use when contacting customer service for assistance.



*Serial Number and Product ID Location*

## Changing from a Minitower to a Desktop Configuration

1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
2. Turn off the computer properly through the operating system and turn off any external devices. Disconnect the power cord from the power outlet and disconnect any external devices.
3. Remove the computer access panel as described in the [“Removing the Computer Access Panel”](#) section.
4. Remove the front bezel as described in the [“Removing the Front Bezel”](#) section.
5. Disconnect all power and data cables from the back of the drives in the 5.25-inch drive bays.
6. 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.



*Releasing the 5.25-inch Drives from the Drive Bays (Minitower)*

7. 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.



#### *Installing a Drive in the Desktop Configuration*

8. 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 drive that is no more than 17 cm (6.7 inches) in depth, including the cables that attach to the back of the drive. 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.

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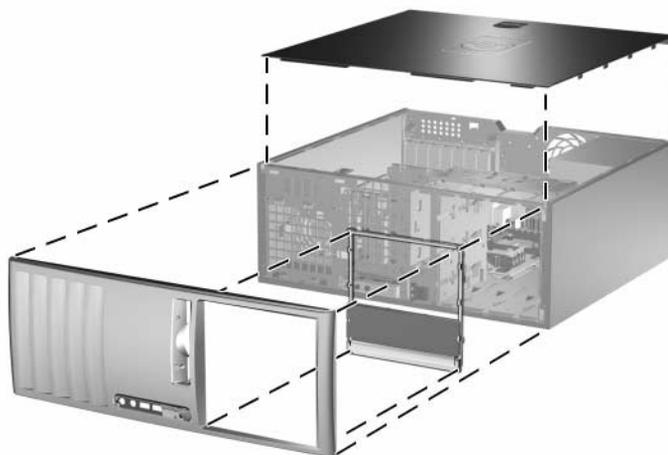
9. Reconnect all power and data cables to the drives in the 5.25-inch drive bays.
10. Remove the bezel subpanel as described in the [“Removing Bezel Blanks”](#) section.



**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.

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11. Reposition the bezel blanks within the subpanel in the proper orientation for the desktop configuration.
12. Reposition the subpanel (rotate it 90°) with the logo at the bottom, then snap it back into the bezel.

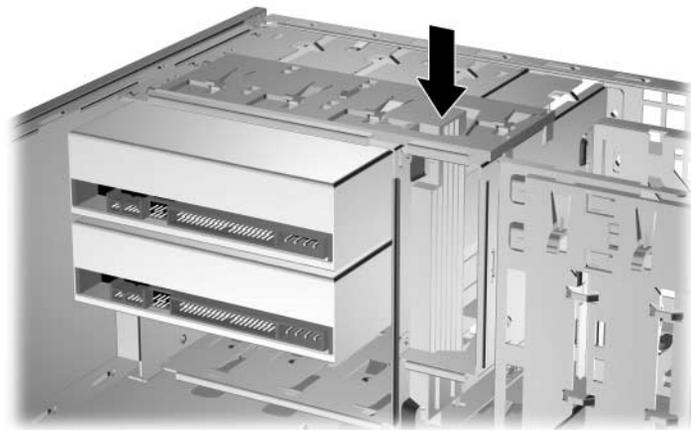


*Changing from a Minitower to a Desktop Configuration*

13. Replace the front bezel and computer access panel.
14. Reconnect the external equipment.
15. If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.

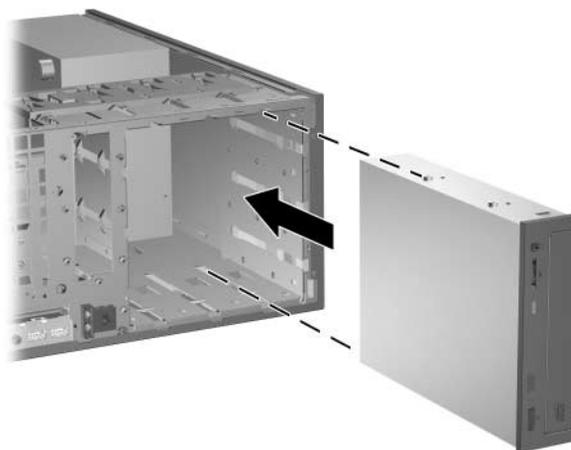
## Changing from a Desktop to a Minitower Configuration

1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
2. Turn off the computer properly through the operating system and turn off any external devices. Disconnect the power cord from the power outlet and disconnect any external devices.
3. Remove the computer access panel as described in the [“Removing the Computer Access Panel”](#) section.
4. Remove the front bezel as described in the [“Removing the Front Bezel”](#) section.
5. Disconnect all power and data cables from the back of the drives in the 5.25-inch drive bays.
6. 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.



*Releasing the 5.25-inch Drives from the Drive Bays (Desktop)*

7. 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.



#### *Installing a Drive in the Minitower Configuration*

8. 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 drive that is no more than 17 cm (6.7 inches) in depth, including the cables that attach to the back of the drive. 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.

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

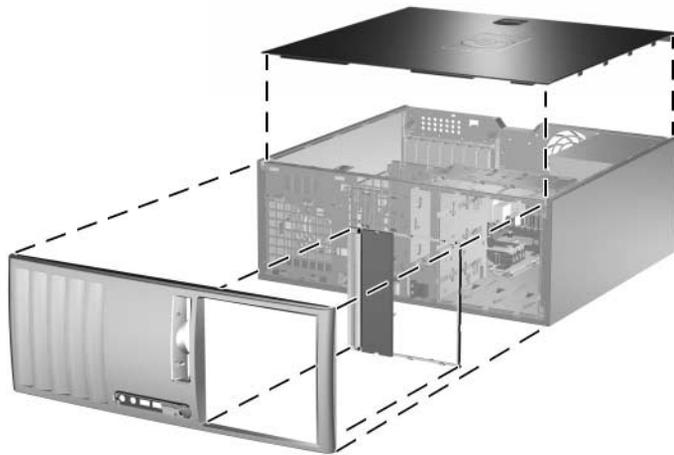
10. Remove the bezel subpanel as described in the “[Removing Bezel Blanks](#)” section.



**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.

---

11. Reposition the bezel blanks within the subpanel in the proper orientation for the minitower configuration.
12. Reposition the subpanel (rotate it 90°) with the logo at the bottom, then snap it back into the bezel.



*Changing from a Desktop to a Minitower Configuration*

13. Replace the front bezel and computer access panel.
14. Reconnect the external equipment.
15. If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.

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# 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.



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

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**WARNING:** To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telecommunications/telephone connectors into the network interface controller (NIC) receptacles.

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**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”](#) for more information.

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**CAUTION:** 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 system board damage.

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## Smart Cover Lock



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The Smart Cover Lock is an optional feature included on some models only.

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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* on the *Documentation and Diagnostics* CD.

## Using the 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



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

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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 ([www.hp.com](http://www.hp.com)) for ordering information.
- Call the appropriate number listed in the warranty.

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

1. Turn off the computer properly through the operating system and turn off any external devices.
2. Disconnect the power cord from the power outlet, and disconnect any external devices.
3. Using the Smart Cover FailSafe Key, remove the two tamper-proof screws that secure the Smart Cover Lock to the chassis.



*Removing the Smart Cover Lock Screws*

4. Remove the access panel. Refer to [“Removing the Computer Access Panel.”](#)

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

## Removing the Computer Access Panel

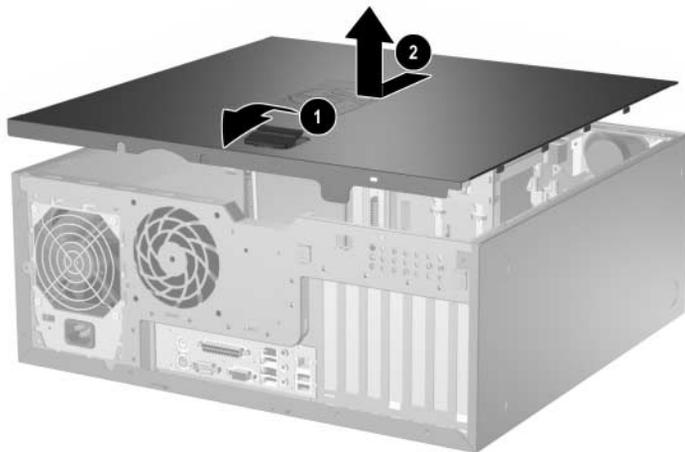
1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
2. Turn off the computer properly through the operating system and turn off any external devices.
3. Disconnect the power cord from the power outlet, and disconnect any external devices.



**CAUTION:** Before removing the computer access panel, ensure that the computer is turned off and that the power cord is disconnected from the electrical outlet.

---

4. Lay the computer down on its large base for greater stability.
5. Lift up on the access panel handle **1**, slide the access panel back about 2.5 cm (1 inch), then lift it up and off the unit **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 slide the access panel forward until it locks into place.

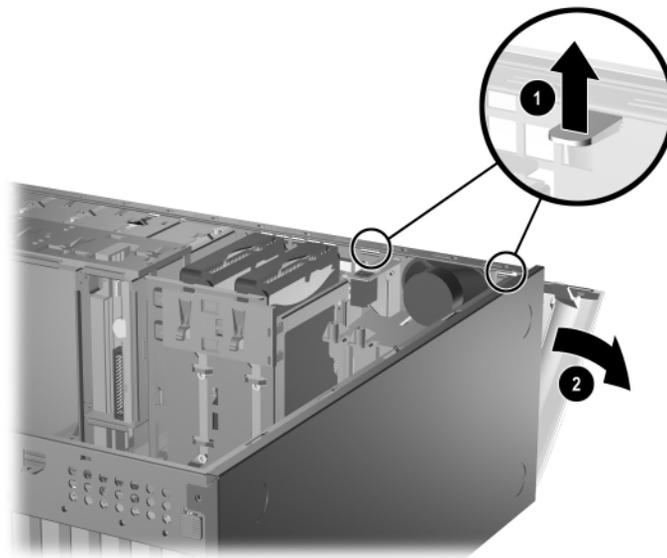


### *Replacing the Computer Access Panel*

3. If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.

## Removing the Front Bezel

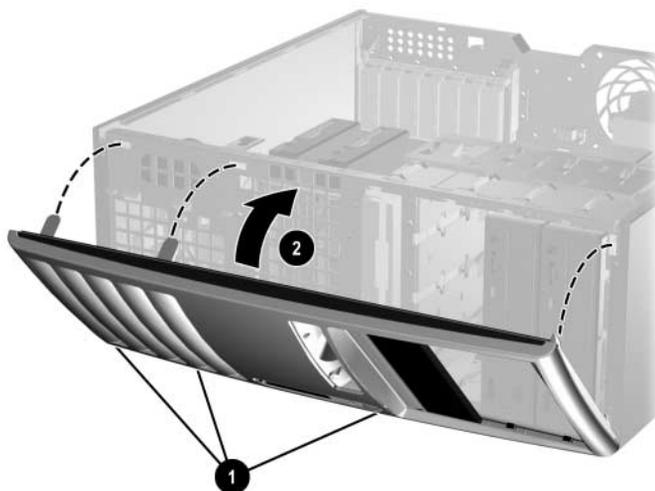
1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
2. Turn off the computer properly through the operating system and turn off any external devices. Disconnect the power cord from the power outlet and disconnect any external devices.
3. Remove the computer access panel.
4. Push up on the two release tabs **1**, then rotate the front bezel away from the chassis to release it **2**.



*Removing the Front Bezel*

## Replacing the Front Bezel

When replacing the front bezel, ensure that the bottom hinge points are properly placed in the chassis **1** and rotate the front bezel back into its original position **2**.



*Replacing the Front Bezel*

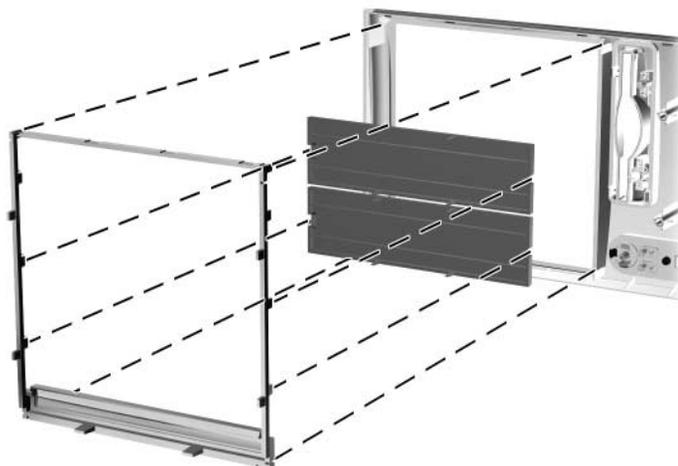
## Removing Bezel Blanks

1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
2. Turn off the computer properly through the operating system and turn off any external devices. Disconnect the power cord from the power outlet and disconnect any external devices.
3. Remove the computer access panel then remove the front bezel.
4. 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.

---



*Removing Bezel Blanks from the Subpanel (Desktop Shown)*



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 4GB 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 PC2-3200 400 MHz or PC2-4200 533 MHz
- 1.8 volt DDR2-SDRAM DIMMs

The DDR2-SDRAM DIMMs must also:

- support CAS latency 3 (CL = 3) for DDR2/400 MHz; support CAS latency 4 (CL = 4) for DDR2/533 MHz
- contain the mandatory JEDEC SPD information

In addition, the computer supports:

- 256Mbit, 512Mbit, and 1Gbit 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



The system will not start if you install unsupported DIMMs.

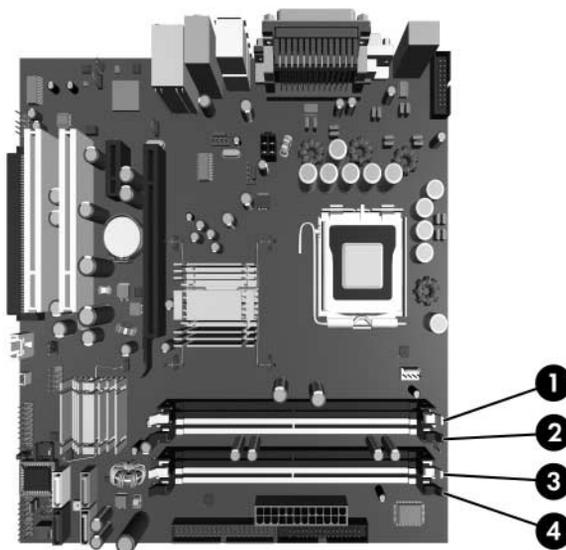
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## Populating DIMM Sockets

The system will automatically operate in single channel mode, dual channel Asymmetric mode, or a higher-performing dual channel Interleaved 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 dual channel Asymmetric 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.
- The system will operate in a higher-performing dual channel Interleaved 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. However, the technology and device width can vary between the channels. For example, if Channel A is populated with two 256MB DIMMS and Channel B is populated with one 512MB DIMM, the system will operate in Interleaved mode.
- In any mode, the maximum operational speed is determined by the slowest DIMM in the system. For example, if the system is populated with a DIMM that is 400 MHz and a second DIMM that is 533 MHz, the system will run at the slower of the two speeds.

There are four DIMM sockets on the system board, with two sockets per channel. The sockets are labeled XMM1, XMM2, XMM3, and XMM4. Sockets XMM1 and XMM2 operate in memory channel A. Sockets XMM3 and XMM4 operate in memory channel B.



*DIMM Socket Locations*

<b>Item</b>	<b>Description</b>	<b>Socket Color</b>
❶	DIMM socket XMM1, Channel A	Black
❷	DIMM socket XMM2, Channel A	White
❸	DIMM socket XMM3, Channel B	Black
❹	DIMM socket XMM4, Channel B	White

## Installing DIMMs



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

---



**CAUTION:** 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"](#).

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

---

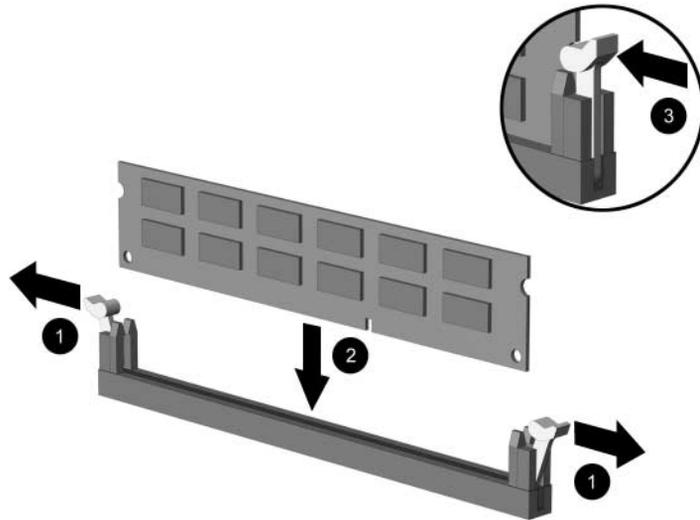
1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
  2. Turn off the computer properly through the operating system and turn off any external devices.
  3. Disconnect the power cord from the power outlet and disconnect any external devices.
  4. Remove the computer access panel.
  5. 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.

---

6. Open both latches of the memory module socket **1**, and insert the memory module into the socket **2**.



#### Installing a DIMM



A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket.



For maximum performance, populate the sockets so that the memory capacity of Channel A is equal to the memory capacity of Channel B. For example, if you have one preinstalled DIMM in socket XMM1 and are adding a second DIMM, it is recommended that you install a DIMM of equal memory capacity into the XMM3 or XMM4 socket.

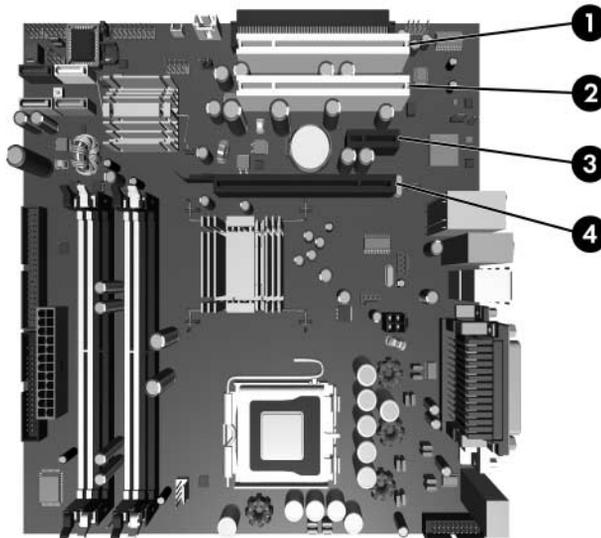
7. Push the module down into the socket, ensuring that the module is fully inserted and properly seated. Make sure the latches are in the closed position **3**.

8. Repeat steps 6 and 7 for to install any additional modules.
9. Replace the access panel.
10. If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.

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

## Installing or Removing an Expansion Card

The computer has two PCI expansion slots that can accommodate an expansion card up to 17.46 cm (6.875 inches) in length. The computer also has one PCI Express x1 expansion slot and one PCI Express x16 expansion slot.



*Expansion Slot Locations*

Item	Description
❶	PCI expansion slot
❷	PCI expansion slot
❸	PCI Express x1 expansion slot
❹	PCI Express x16 expansion slot



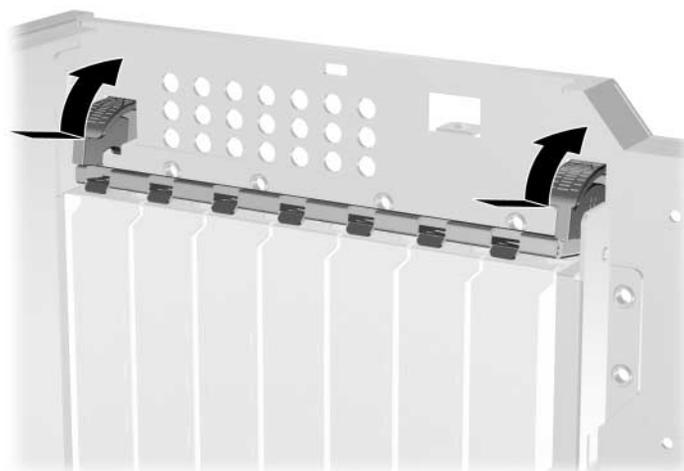
Some models include an optional PCI extender that adds two PCI expansion slots to the board for a total of four PCI expansion slots.



You can install a PCI Express x1, x4, x8, or x16 expansion card in the PCI Express x16 expansion slot.

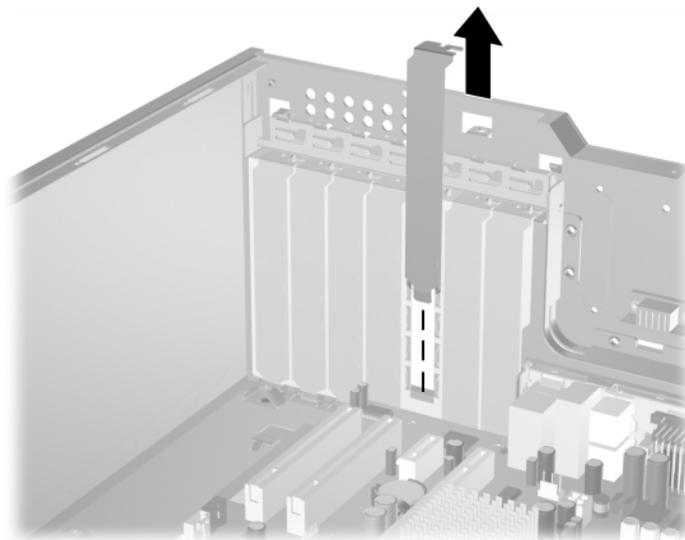
To install an expansion card:

1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
2. Turn off the computer properly through the operating system and turn off any external devices.
3. Disconnect the power cord from the power outlet, then disconnect any external devices.
4. Remove the computer access panel.
5. Locate the correct vacant expansion socket on the system board and the corresponding expansion slot on the back of the computer chassis.
6. Push down and out on the two green thumb tabs inside the chassis and rotate the expansion card retention latch up.



*Opening the Expansion Slot Retainer*

7. Before installing an expansion card, remove the expansion slot cover or the existing 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.



*Removing an Expansion Slot Cover*

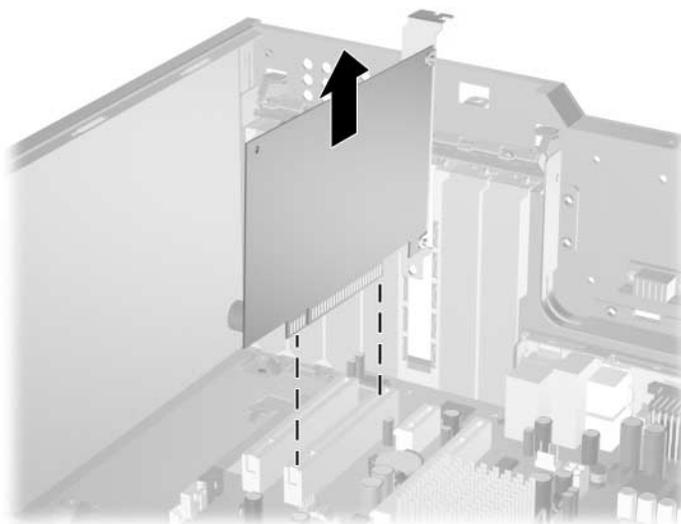
- b. If you are removing a standard PCI card, hold the card at each end and carefully rock it back and forth until the connectors pull free from the socket. Lift the card straight up to remove it. Be sure not to scrape the card against other components.



---

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

---

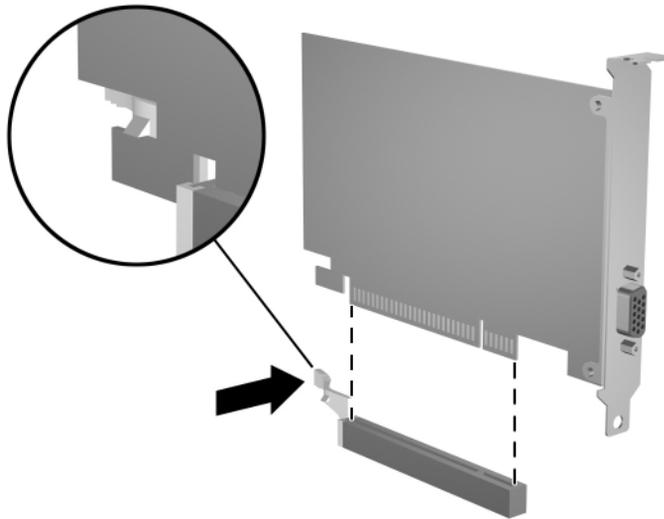


*Removing a Standard PCI Expansion Card*

- 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.



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



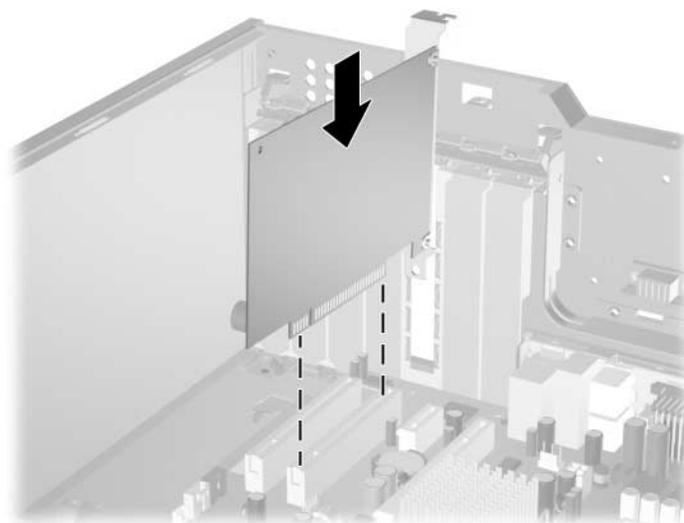
#### *Removing a PCI Express x16 Expansion Card*

8. Store the card in anti-static packaging.
9. 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.

10. 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.



#### *Installing an Expansion Card*

---



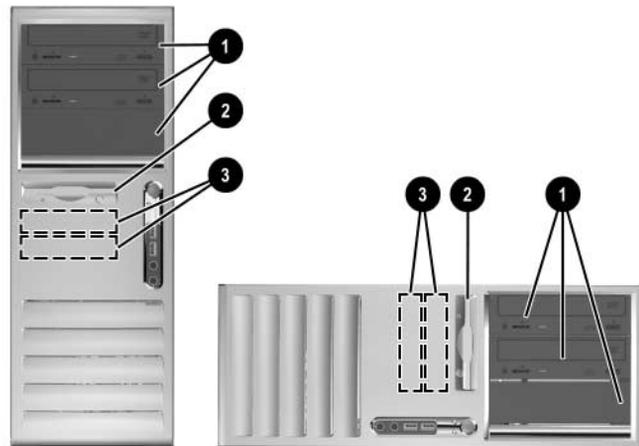
When you install an expansion card, make sure you press firmly on the card so that the whole connector seats properly in the expansion card socket.

---

11. Close the expansion card retention latch, making sure that it snaps firmly into place.
12. Connect external cables to the installed card, if needed. Connect internal cables to the system board, if needed. If the card requires audio, connect the audio cable to the connector on the system board labeled “Aux” (located towards the edge of the system board in front of the PCI slots).
13. Replace the computer access panel.
14. If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.

15. Reconfigure the computer, if necessary. Refer to the *Computer Setup (F10) Utility Guide* on the *Documentation and Diagnostics* CD for instructions about using Computer Setup.

## Drive Positions



### Desktop and Minitower Drive Positions

- ❶ Three 5.25-inch, half-height bays for optional drives (an optional hard drive mounting bracket for these drive bays is available from HP)
- ❷ One standard 3.5-inch, one-third height bay (1.44-MB diskette drive shown)\*
- ❸ Two internal 3.5-inch, one-third height bays for hard drives

\*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 device (such as a diskette drive, hard drive, or Zip drive) 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* on the *Documentation and Diagnostics* CD for more information.

## Installing Additional Drives

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

When installing additional drives, follow these guidelines:

- The primary Serial ATA (SATA) hard drive should be connected to the primary SATA controller on the system board labeled P60 SATA 0. Connect a second SATA hard drive to the secondary SATA controller labeled P61 SATA 1. Connect a third SATA drive to P62 SATA 2 and a fourth SATA drive to P63 SATA 3. HP does not support connecting both SATA and 3.5-inch PATA hard drives on the same system.
- Connect Parallel ATA (PATA) expansion devices, such as optical, IDE tape, and Zip drives, to the PATA controller (labeled P20 PRIMARY IDE) using a standard 80-conductor cable.
- 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 with the computer. The hard drive uses 6-32 standard 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 screws are black. The HP-supplied standard screws are silver.



**CAUTION:** To prevent loss of work and damage to the computer or drive:

- If you are inserting or removing a hard drive, shut down the operating system properly, turn off the computer, and unplug the power cord. Do not remove a hard 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."](#)
  - 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."
-

## Installing an Optical or other Removable Storage Device

---



An optical drive is a CD-ROM, CD-R/RW, DVD-ROM, DVD+R/RW, or CD-RW/DVD Combo drive.

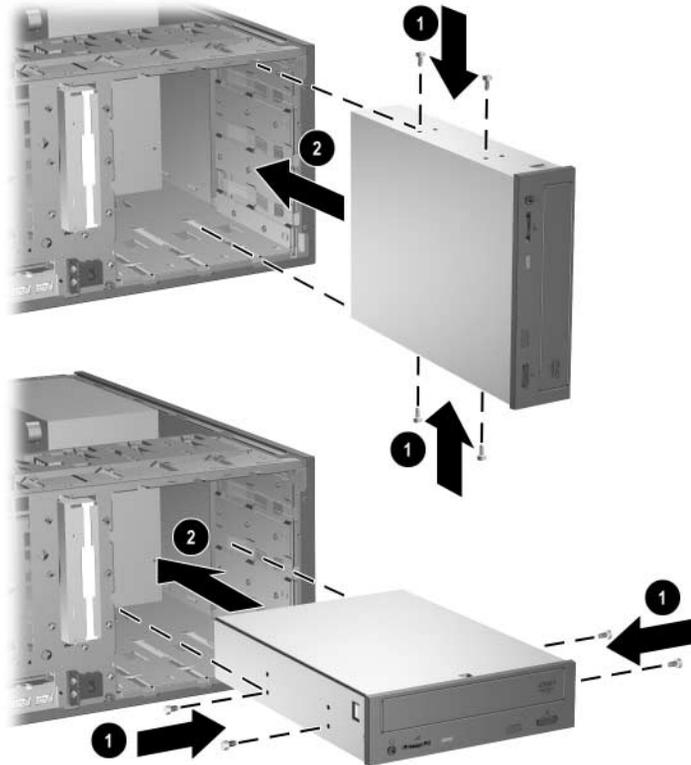
---

1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
  2. Turn off the computer properly through the operating system and turn off any external devices. Disconnect the power cord from the power outlet and remove the computer access panel.
  3. Remove the front bezel.
  4. Install two guide screws in the lower holes on each side of the drive **1**.
- 



Optical and diskette drives 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.

---



*Installing a 5.25-Inch Drive on a Minitower (top) and Desktop (bottom)*

5. Install the drive in the desired drive bay by sliding it into the front of the drive cage 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 drive that is no more than 17 cm (6.7 inches) in depth, including the cables that attach to the back of the drive. 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.



If you are installing a third optional drive in the bottom 5.25-inch drive bay, you must also install an expansion card with an IDE controller and data cable (not supplied) because the secondary IDE controller supports only two drives.

---



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

---

6. Connect the power and signal cables to the rear of the drive.



#### *Connecting the Drive Cables*

7. Remove the appropriate bezel blank from the subpanel inside the front bezel. See the [“Removing Bezel Blanks”](#) section for more information.
8. Replace the computer access panel and front bezel.
9. If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.
10. Reconfigure the computer, if necessary. Refer to the *Computer Setup (F10) Utility Guide* on the *Documentation and Diagnostics* CD for instructions about using Computer Setup.

---

## Installing a SATA Hard Drive into a 3.5-inch Drive Bay



If you are replacing a hard drive, make sure to back up the data on the old hard drive before removing it so that you can install the data onto the new hard drive.

---



HP does not support connecting both SATA and 3.5-inch PATA hard drives on the same system.

---

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

1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
2. Turn off the computer properly through the operating system and turn off any external devices. Disconnect the power cord from the power outlet and remove the computer access panel.
3. Install four 6-32 standard guide screws, two on each side of the drive.



### *Installing the Hard Drive Guide Screws*

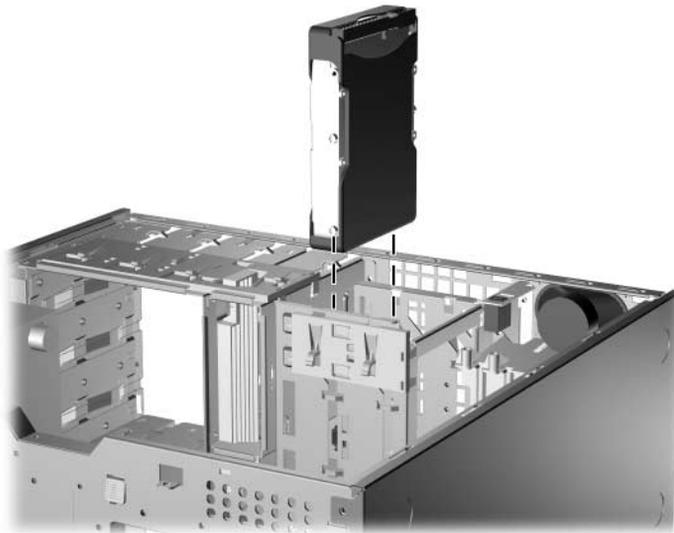
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The hard drive uses 6-32 standard guide screws. Four extra guide screws are installed on the hard drive bracket under the access panel. The HP-supplied standard screws are silver. All other drives use M3 metric screws, eight of which are installed on the diskette drive bracket under the access panel. The HP-supplied metric screws are black.

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4. Slide the hard drive down into the drive cage; the drivelock automatically secures the drive in the bay.



*Installing a Hard Drive into the Hard Drive Bay*

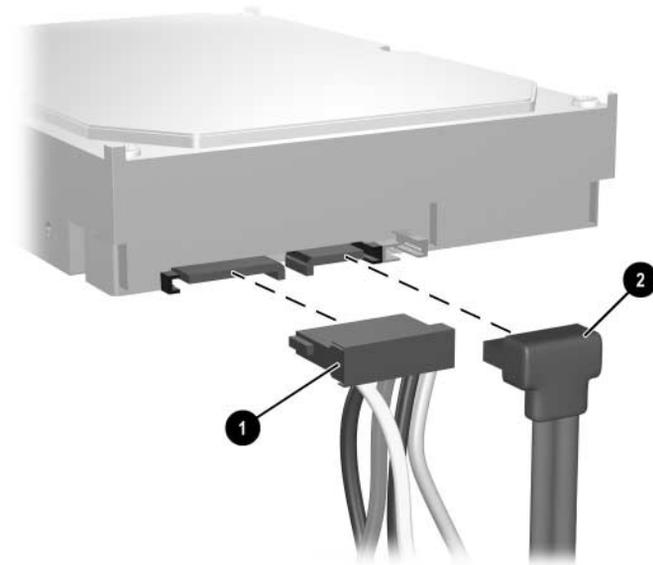


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**CAUTION:** Make sure the guide screws line up with the guide slots in the drive cage. The use of unnecessary force when installing any drive into the drive bay may result in damage to the drive.

---

5. Connect the power cable ❶ and data cable ❷ to the hard drive.



#### Connecting the Power Cable and Data Cable to a SATA Hard Drive

6. Connect the opposite end of the data cable to the appropriate system board connector.



If your system has only one SATA hard drive, you must connect the hard drive to the connector labeled P60 SATA 0 first to avoid any hard drive performance problems. If you are adding a second hard drive, connect the data cable to the system board connector labeled P61 SATA 1.

7. Replace the computer access panel.
8. If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.
9. Reconfigure the computer, if necessary. Refer to the *Computer Setup (F10) Utility Guide* on the *Documentation and Diagnostics* CD for instructions about using Computer Setup.



If you replaced the primary hard drive, insert the *Restore Plus!* CD to restore the operating system, software drivers, and any software applications that were preinstalled on the computer. Follow the instructions in the guide included with the *Restore Plus!* CD. When the restore process has completed, reinstall any personal files that you backed up before replacing the hard drive.

---

## Removing a Drive from the Drive Bay

1. If you have locked the Smart Cover Lock, restart the computer and enter Computer Setup to unlock the lock.
2. Turn off the computer properly through the operating system and turn off any external devices. Disconnect the power cord from the power outlet and remove the computer access panel.
3. Remove the front bezel.
4. Disconnect the power and data cables on the back of the drive.

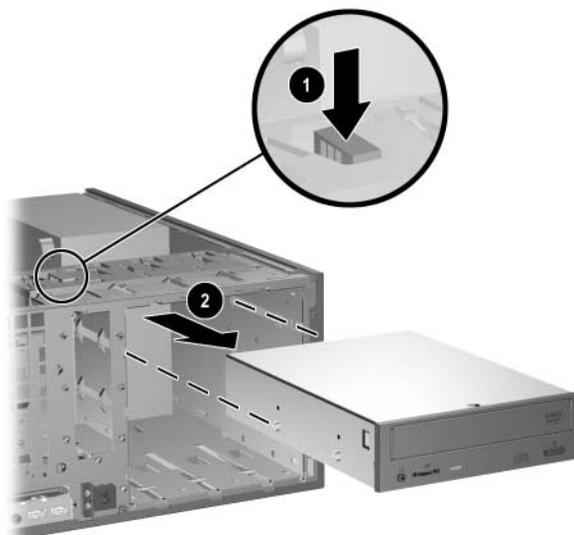


**CAUTION:** When removing the cables, pull the tab or connector instead of the cable itself to avoid damaging the cable.

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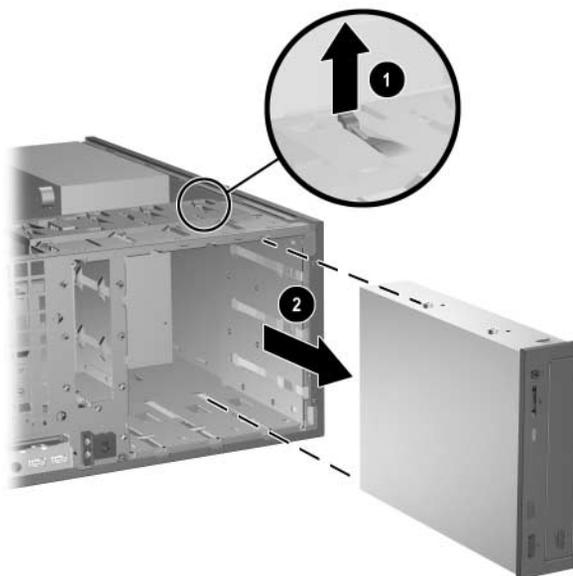
5. Remove the drive from the drive bay as follows:

- ❑ To remove an optical drive in the desktop configuration, press down on the yellow drivelock mechanism ❶ and slide the drive from the drive bay ❷.



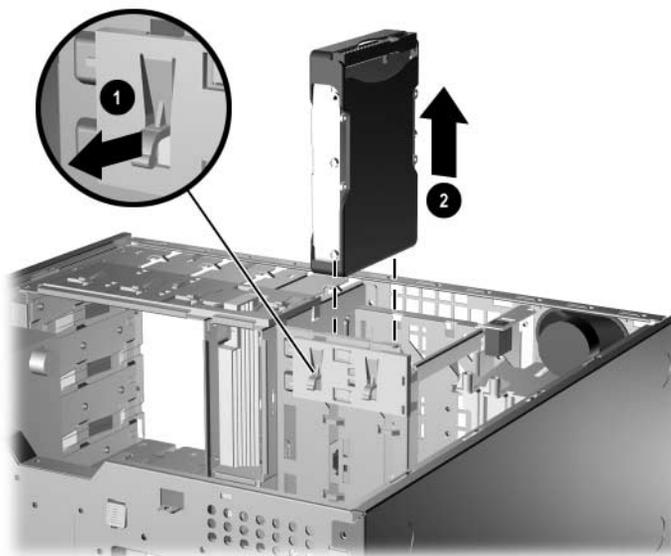
*Removing an Optical Drive in the Desktop Configuration*

- ❑ To remove a diskette drive or an optical drive in the minitower configuration, pull up on the green drivelock mechanism ❶ for that specific drive and slide the drive from the drive bay ❷.



*Removing a Diskette Drive or an Optical Drive in the Minitower Configuration (Optical Drive Shown)*

- ❑ To remove a hard drive, pull up on the green hard drive drivelock mechanism ① for that drive and slide the drive from the drive bay ②.



#### Removing a Hard Drive

6. Store the removed drive in anti-static packaging.

---

## Specifications

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### HP Compaq Convertible Minitower

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#### Desktop Dimensions

Height	6.6 in	16.7 cm
Width	17.65 in	44.8 cm
Depth (depth will increase if the computer is equipped with a port security bracket)	17.8 in	45.2 cm

#### Tower Dimensions

Height	17.65 in	44.8 cm
Width	6.6 in	16.7 cm
Depth (depth will increase if the computer is equipped with a port security bracket)	17.8 in	45.2 cm

#### Approximate Weight

35 lb	15.9 kg
-------	---------

#### Weight Supported (maximum distributed load for Desktop configuration only)

100 lb	45.5 kg
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#### Temperature Range

Operating	50° to 95°F	10° to 35°C
Nonoperating	-22° to 140°F	-30° to 60°C

#### 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

---

 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.

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**HP Compaq Convertible Minitower (Continued)**

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**Heat Dissipation**

Maximum	1,916 BTU/hr	483 kg-cal/hr
Typical (idle)	375 BTU/hr	95 kg-cal/hr

**Power Supply**

	<b>115V</b>	<b>230V</b>
Operating Voltage Range*	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)\***

6A @ 100 VAC	3A @ 200 VAC
--------------	--------------

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\*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.

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## 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.



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.

---



**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 (140°F).
  - 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* on the *Documentation and Diagnostics* CD for information on backing up the CMOS settings.

---



Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. In order to forward them to recycling or proper disposal, please use the public collection system or return them to HP, their authorized partners, or their agents.

---



**CAUTION:** 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.

---

1. If you have locked the Smart Cover Lock, use Computer Setup to unlock the lock and disable the Smart Cover Sensor.
  2. Turn off the computer properly through the operating system, then turn off any external devices. Disconnect the power cord from the power outlet and disconnect any external devices. Then remove the computer access panel.
- 



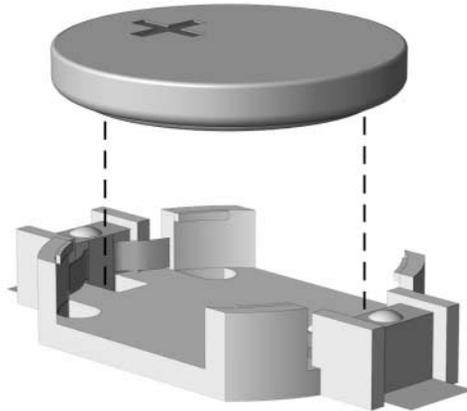
It may be necessary to remove an expansion card to gain access to the battery.

---

3. Locate the battery and battery holder on the system board.
4. 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.

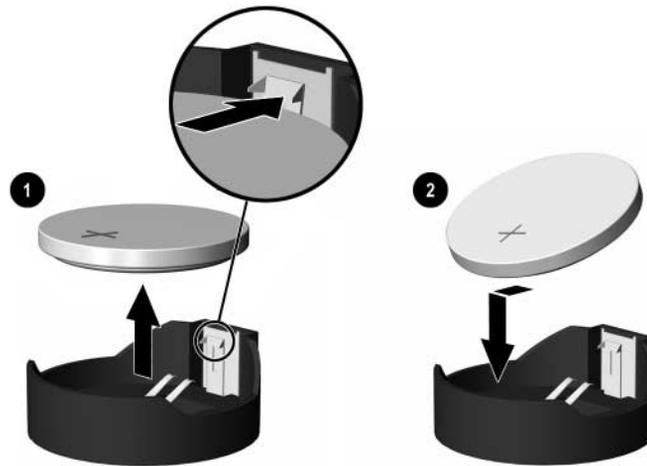


*Removing a Coin Cell Battery (Type 1)*

- b. Slide the replacement battery into position, positive side up. The battery holder automatically secures the battery in the proper position.

## Type 2

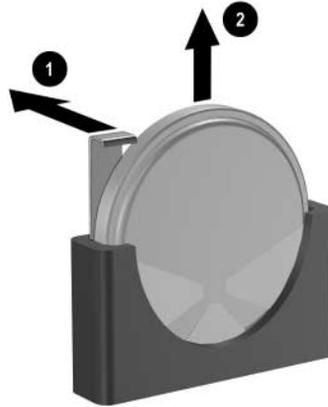
- a. To release the battery from its holder, squeeze the metal clamp that extends above one edge of the battery. When the battery pops up, lift it out ❶.
- b. To insert the new battery, slide one edge of the replacement battery under the holder's lip with the positive side up. Push the other edge down until the clamp snaps over the other edge of the battery ❷.



*Removing and Replacing a Coin Cell Battery (Type 2)*

### Type 3

- a. Pull back on the clip ❶ that is holding the battery in place, and remove the battery ❷.
- b. Insert the new battery and position the clip back into place.



*Removing a Coin Cell Battery (Type 3)*



After the battery has been replaced, use the following steps to complete this procedure.

---

5. Replace the computer access panel.
6. Plug in the computer and turn on power to the computer.
7. Reset the date and time, your passwords, and any special system setups, using Computer Setup. Refer to the *Computer Setup (F10) Utility Guide* on the *Documentation and Diagnostics CD*.
8. If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.

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## Security Lock Provisions



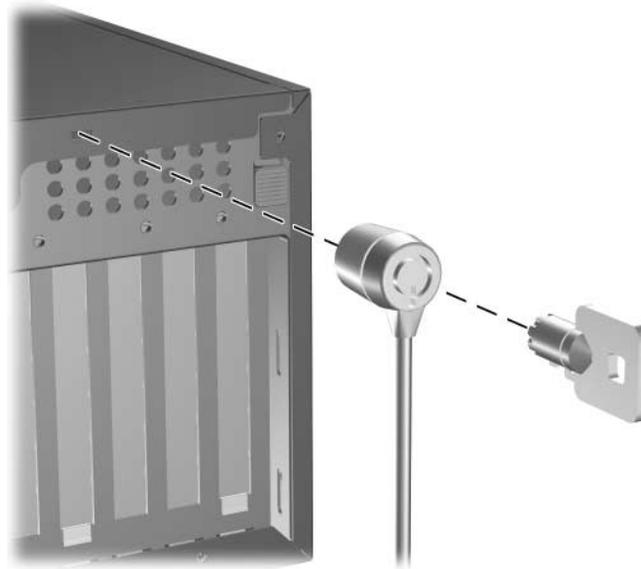
For information on data security features, refer to the *Computer Setup (F10) Utility Guide* and the *Desktop Management Guide* on the *Documentation and Diagnostics CD* and the *HP ProtectTools Security Manager Guide* (some models) at [www.hp.com](http://www.hp.com).

---

### Installing a Security Lock

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

#### Cable Lock



*Installing a Cable Lock*

## Padlock



*Installing a Padlock*

## Universal Chassis Clamp Lock

### Without Security Cable

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



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



3. Insert the plug into the lock ① and push the button in ② to engage the lock. Use the key provided to disengage the lock.



## With Security Cable

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



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



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



4. Insert the plug end of the security cable into the lock ❶ and push the button in ❷ to engage the lock. Use the key provided to disengage the lock.



---

## 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.



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

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## 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. For information about the recommended temperature and humidity ranges for the computer, refer to [Appendix A, “Specifications”](#) in this guide.
- 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 cover or side panel 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.



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

---

2. Remove and store any program diskettes from the diskette drives.
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.



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.



For environmental nonoperating ranges, see [Appendix A, “Specifications”](#) in this guide.

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