Hardware Reference Guide

Compaq Deskpro EX and EXS Series
of Personal Computers

COMPAQ

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Notice

The following words and symbols mark special messages throughout this guide:

> **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.

Hardware Reference Guide

Compaq Deskpro EX and Deskpro EXS Series of Personal Computers

CONTENTS

chapter *1*

INSTALLATION GUIDELINES

This guide explains how to remove the computer cover and install the following optional equipment upgrades:

■ Additional system memory

■ Expansion card

■ Optional drive

■ Replacement battery

This chapter includes information about the general installation sequence for Deskpro personal computers, and about when to reconfigure the computer to ensure that it recognizes the newly installed equipment.

Installation Sequence

It is very important that you follow this sequence of steps to ensure the proper installation of any optional equipment.

1. If the computer is already on, turn it off and disconnect the power cord from the wall outlet.

> ⚠ **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.

> ⚠ **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.

> △ **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. Refer to Appendix D, "Electrostatic Discharge," for more information.

2. Open the computer by removing its outside cover. Refer to the procedures for removing the computer cover.

3. Install any optional equipment. Refer to the applicable sections of this guide or to the documentation provided with the optional equipment for instructions.

4. Replace the computer cover.

5. Turn on the monitor, computer, and any devices you want to test.

6. Reconfigure the computer, if necessary. Refer to the *Computer Setup Guide* for instructions about using Computer Setup.

When to Reconfigure the Computer

System configuration is the process of specifying the devices and programs that make up a computer system. When you add or remove optional equipment, the computer must be reconfigured to recognize these changes.

Windows 95 and later operating systems automatically recognize all Plug and Play devices installed. However, if the device is not a Plug and Play device or is not automatically detected after installation, follow these instructions:

■ In Windows 95 and later operating systems, select the Add New Hardware icon in the Control Panel and follow the instructions on the screen.

■ In Windows NT version 4.0, use the software utility provided with the newly installed hardware.

Compaq Configuration Record Utility

The Compaq Configuration Record Utility is an online information-gathering tool that gathers critical hardware and software information. The Configuration Record Utility delivers a comprehensive configuration record, provides a means for automatically identifying and comparing configuration changes, and has the ability to maintain a computer configuration history. The information can be saved as a history of multiple sessions.

The Compaq Configuration Record Utility is accessed via an icon in the Control Panel. When running the utility, information is automatically gathered on such items as the operating system version number, operating system parameters, and the operating system startup files. The utility then combines this information with information on the hardware configuration to deliver a comprehensive view of the computer.

This utility allows resolution of problems without taking the computer off-line and assists in maximizing computer availability. The information obtained by the utility is useful in troubleshooting computer problems, and streamlines the service process by enabling quick and easy identification of computer configurations, which is the first step in resolving service cases.

chapter 2

HARDWARE UPGRADES: DESKTOP

Serviceability Features

Your computer includes features that make it easier to upgrade and service.

Removing the Computer Cover

To install optional equipment, you must remove the computer cover to gain access to internal components. The quick release cover latches on the sides of the computer allow easy removal of the computer cover without the use of tools. To remove the cover, follow these steps:

1. Shut down the operating system properly, then turn off the computer and any external devices. Disconnect the power cord from the power outlet and disconnect any external devices.

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

2. Press in the button on each side of the front bezel to release the quick release cover latches ❶.

3. Slide the computer cover forward about 1 inch, then lift up and off the unit ❷.
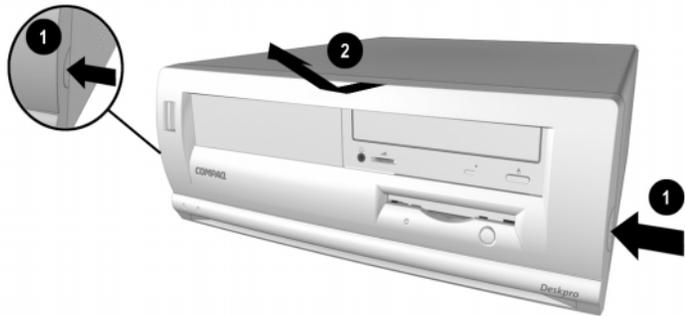
Removing the Computer Cover

✎   To replace the computer cover, reverse this procedure.

Removing the Front Bezel

The bezel on the front of the chassis can be removed. To remove the front bezel:

1. Shut down the operating system properly, then turn off the computer and any external devices. Disconnect the power cord from the power outlet and disconnect any external devices.

2. Remove the computer cover and lay the cover top down on a protected work surface.

3. Remove the five screws connecting the front bezel to the computer cover ❶.

✎   When removing the front bezel from the computer cover, the computer cover quick release buttons may fall out.

4. Lift up on the two tabs at the top of the bezel so the tabs disconnect from the computer cover ❷.

5. Remove the bezel from the computer cover ❸.
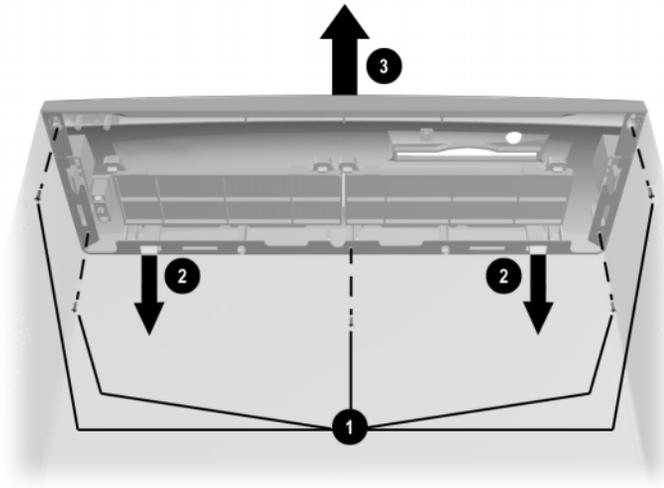
Removing the Front Bezel

✎   When replacing the front bezel, be sure to reinstall the computer cover quick release buttons.

Removing Bezel Blanks

1. Shut down the operating system properly, then turn off the computer and any external devices. Disconnect the power cord from the power outlet and disconnect any external devices.

2. Remove the computer cover and lay the cover top down on a protected work surface.

3. Push the two snaps at the bottom of the bezel blank toward the top of the cover to release from the bezel blank tabs ❶.

4. Remove the bezel blank ❷.
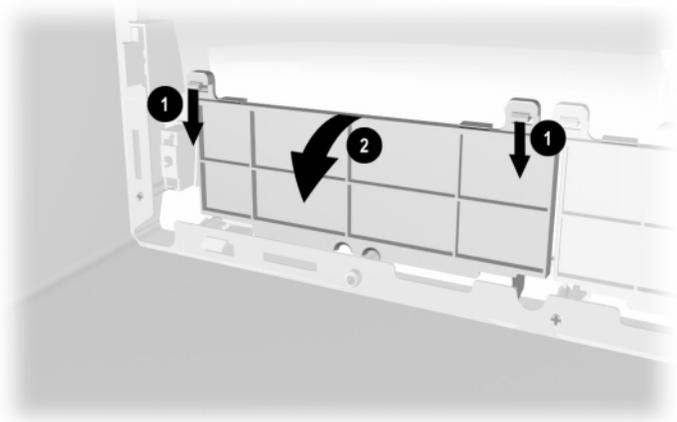
Removing Bezel Blanks from the Front Bezel

Installing Additional Memory

The memory sockets on the system board can be populated with industry-standard DIMMs. These memory sockets are populated with at least one preinstalled memory module. The computer comes with synchronous dynamic random access memory (SDRAM) dual inline memory modules (DIMMs).

To achieve the maximum memory support, you may be required to replace the preinstalled DIMM with a higher capacity DIMM.

For proper system operation, the DIMMs must be industry-standard 168-pin, 133 MHz, unbuffered, PC133–compliant SDRAM DIMMs, depending on the model. The SDRAM DIMMs must support CAS Latency 2 or 3 (CL = 2 or CL = 3). They must also contain the mandatory Joint Electronic Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information. DIMMs constructed with x4 SDRAM are not supported; the system will not start using unsupported DIMMs.

The system board supports both PC100 and PC133 SDRAM DIMMs. PC133 DIMMs should be used for optimal performance. If both PC100 and PC133 SDRAM DIMMs are installed in a computer, the system memory will run at the lower 100MHz speed.

Memory Module Installation

△ **CAUTION:** Your memory module sockets have gold metal contacts. When upgrading your 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. Refer to Appendix D, "Electrostatic Discharge," for more information.

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

1. Shut down the operating system properly, then turn off the computer and any external devices, then disconnect the power cord from the power outlet.

2. Remove the computer cover and locate the memory module sockets.

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

3. Open both latches of the memory module socket ❶, and insert the memory module into the socket ❷.

4. A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket. Push the module down into the socket, ensuring that the module is securely seated ❸.
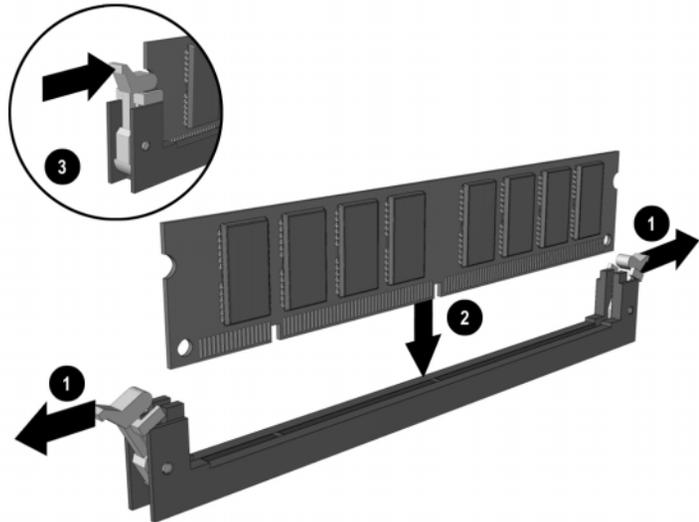
Installing a Memory Module

5. Replace the computer cover.

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

Expansion Cards

Your computer contains expansion slots, as shown below.
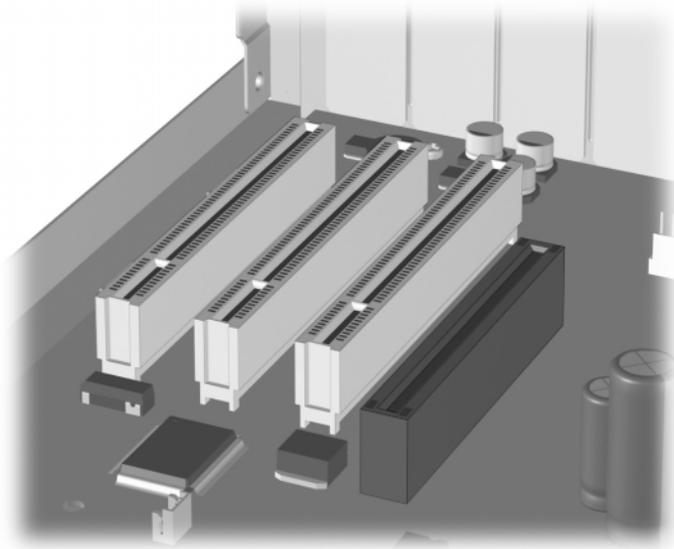
Expansion Slot Layout

Removing an Expansion Slot Cover

1. Shut down the operating system properly, then turn off the computer and any external devices, then disconnect the power cord from the power outlet.

2. Remove the computer cover and locate the correct vacant slot in the computer chassis.

3. Remove the screw securing the slot cover, then remove the expansion slot cover from the slot as illustrated.
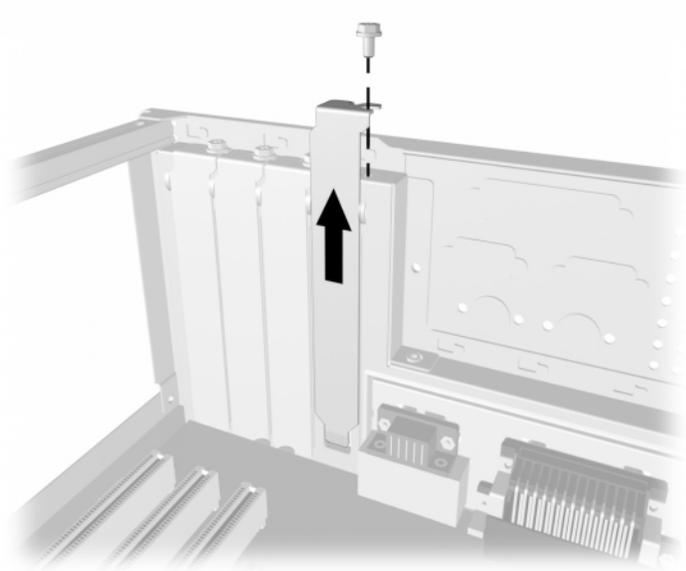
Removing the Screw and Expansion Slot Cover

Removing or Installing an Expansion Card

The computer has three PCI expansion slots and one AGP expansion slot. To install an expansion card:

1. Shut down the operating system properly, then turn off the computer and any external devices, then disconnect the power cord from the power outlet.

2. Remove the computer cover.

3. If installing a new expansion card, skip to step 10.

4. To remove an installed expansion card, disconnect any cables attached to the expansion card.

5. Remove the screw at the side of the expansion slot.

6. Hold the card at each end and carefully rock it back and forth until the connectors pull free from the slot. Be sure not to scrape the card against other components.

7. Store the card in anti-static packaging.

8. You must now either install an expansion slot cover or new expansion card to close the open slot.

9. If you are not installing another card, close off the open slot by installing a slot cover with a screw.

10. If installing a new expansion card, remove the slot cover, then slide the expansion card into the expansion slot and press it firmly into place.

Removing or 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 slot.

11. Connect any cables that should be attached to the expansion card.

12. Replace the screw at the side of the expansion slot.

13. Replace the computer cover.

14. Connect external cables to the installed card, if needed.

15. Reconfigure the computer, if necessary. Refer to Chapter 1, "Installation Guidelines."

Installing Additional Drives

The computer supports up to four drives which may be installed in various configurations.

When installing additional drives, follow these guidelines:

■ For optimal performance, connect the hard drive to the primary controller. Connect expansion devices, such as a CD-ROM or IDE tape drives to the secondary controller.

■ The internal 3.5-inch, one-third height bay, front-mounted hard drive is not supported.

■ Some drives must be secured using screws. Compaq has provided extra screws, installed in the front of the computer chassis, behind the front bezel.

Drive Positions
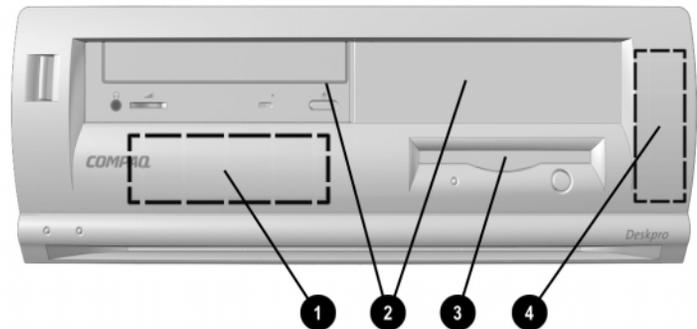
Drive Positions

❶ Internal 3.5-inch, one-third height bay for a front-mounted hard drive (this drive is not supported)

❷ Two 5.25-inch, full-height bays for optional drives

❸ Standard 3.5-inch, 1.44-MB diskette drive

❹ Internal 3.5-inch, one-third height bay with adapter for the side-mounted hard drive

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

Installing and Replacing a Side-Mounted Hard Drive

A side-mounted hard drive bay is located on the right side of the computer. An adapter must be used to install a hard drive in this bay. To install or replace a hard drive, you must first remove the drive adapter, install or replace the hard drive in the adapter, then reinstall the hard drive adapter assembly.

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

- If you are inserting or removing a hard drive, turn off the computer. 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 suitable protective packaging and label the package "Fragile: Handle With Care."

To remove the side-mounted hard drive adapter:

1. Shut down the operating system properly, then turn off the computer and any external drives, disconnect the power cord from the power outlet, and remove the computer cover.

2. If replacing a hard drive, disconnect the power and data cables from the back of the drive inside of the adapter.

3. Remove the two screws at the top of the hard drive adapter that connect the adapter to the chassis ❶.

4. Slide the adapter toward the right until the two slots on the bottom of the adapter clear the tabs ❷.

5. Tilt and lift the hard drive adapter out of the chassis ❸.

✎ The bottom of the adapter must be tilted inward to remove it from the chassis.
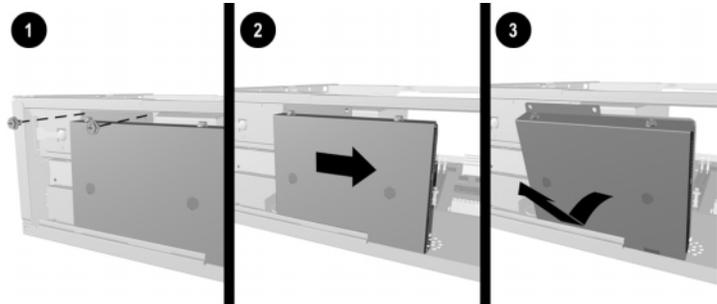
Removing the Hard Drive Adapter

If installing a hard drive into a previously empty adapter, skip to step 6.

6. Remove the drive from the drive adapter by first removing the four screws that connect the drive to the adapter, and then sliding the drive out of the adapter.
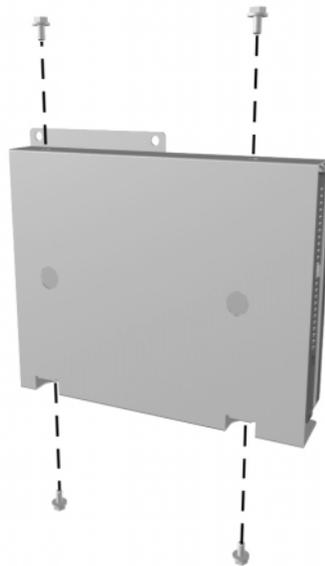
Attaching or Removing a Hard Drive to or from the Hard Drive Adapter

7. Insert a new drive into the drive adapter by sliding the drive into the adapter, then installing four screws to connect the drive to the adapter.

8. Reinstall the adapter into the computer by lining up the slots in the bottom of the adapter with the tabs in the chassis ❶.

9. Slide the adapter to the left so the slots in the adapter connect with the tabs in the chassis ❷.

10. Install the two screws that connect the adapter to the chassis ❸.
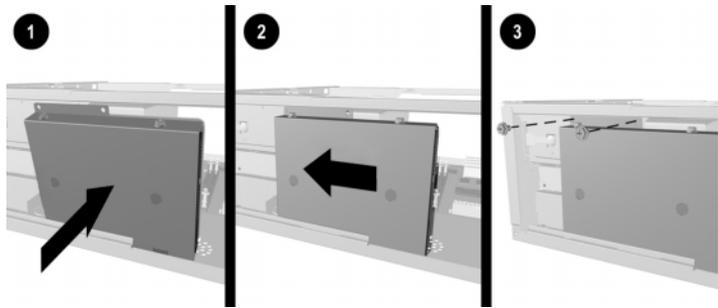
Installing the Hard Drive Adapter

11. When replacing a hard drive, connect the data cable ❶ and the drive power cable ❷ to the back of the hard drive.
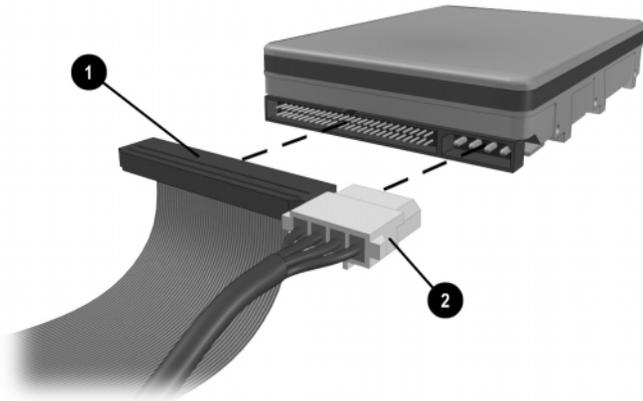
Connecting Hard Drive Cables

Installing a 5.25-Inch Drive in the Right Drive Bay

To access drives in the right drive bay, the side-mounted hard drive must first be removed from the computer.

To install 5.25-inch drive in the right drive bay:

1. Shut down the operating system properly, then turn off the computer and any external drives, disconnect the power cord from the power outlet, and remove the computer cover.

2. Remove the side-mounted hard drive.

3. While facing the front of the drive, insert a guide screw into the top, front hole on the right side of the drive.
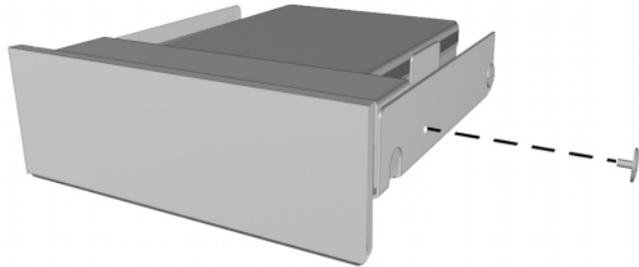
Inserting a Retaining Screw in the Left Side of a Drive

4. Slide the drive into the drive bay ❶.

5. Insert a retaining screw into the top, rear hole on the the right side of the drive to secure the drive in the bay ❷.
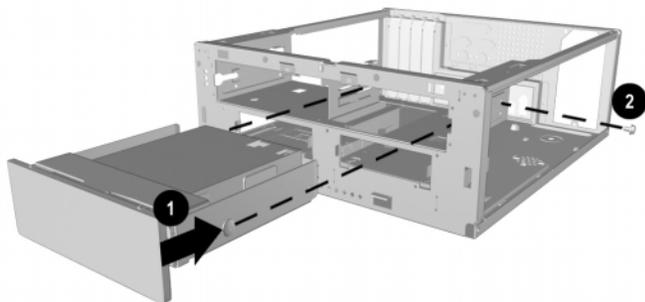
Installing a 5.25-Inch Drive in the Right Drive Bay

6. Connect the drive power ❶ and signal cables ❷ and, if it is a CD-ROM drive, connect the audio cable ❸. The other end of the audio cable should be connected to the audio connector on the system board.
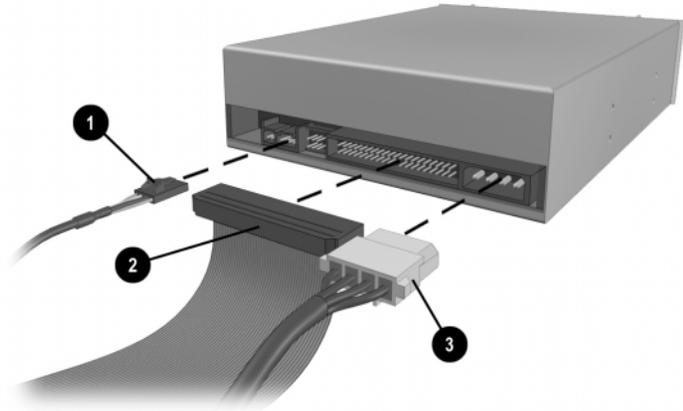
Connecting the Drive Cables

7. Remove the appropriate bezel blank from the front bezel. (Refer to the section "Removing Bezel Blanks.")

8. Replace the computer cover.

9. Reconfigure the computer, if necessary. Refer to Chapter 1, "Installation Guidelines," for more information.

Removing a 5.25-Inch Drive

1. Shut down the operating system properly, then turn off the computer and any external devices, disconnect the power cord from the power outlet, and remove the computer cover.

2. Disconnect the drive power cable, signal cable, and audio connector, if applicable.

3. Remove the retaining screw that secures the drive in the bay ❶.

   If you are removing a drive from the left bay, remove the retaining screw from the left side of the drive.

   If you are removing a drive from the right bay, remove the retaining screw from the right side of the drive.

4. Pull the drive out of the bay ❷.
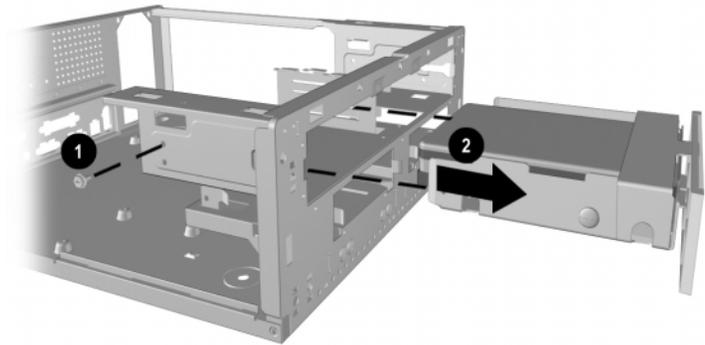
Removing a 5.25-Inch Drive (Left Bay Shown)

5. Store the drive in antistatic packaging.

Installing a Diskette Drive

The diskette drive bay is located directly below the right full-height drive bay. The side-mounted hard drive must be removed to install a diskette drive.

To install a diskette drive:

1. Shut down the operating system properly, then turn off the computer, disconnect the power cord from the power outlet, and remove the computer cover.

2. With the drive turned upside down, insert two guide screws into the holes on the bottom outside edges closest to the front of the drive.

3. Remove the side-mounted hard drive.

4. Insert the diskette drive into the diskette drive bay ❶.

5. Insert a retaining screw on the right side in the hole closest to the back of the drive to secure the drive in the bay ❷.
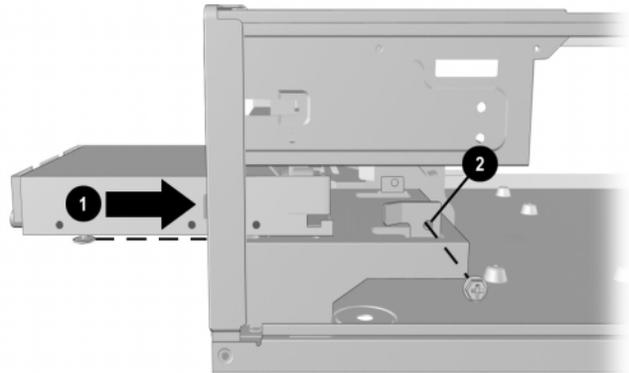
Installing a Diskette Drive

6. Connect the data cable ❶ and the drive power cable ❷ to the back of the diskette drive.
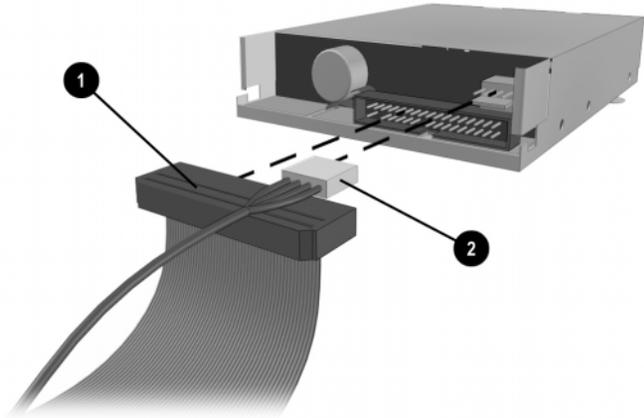
Connecting the Drive Cables

7. Replace the computer cover.

8. Reconfigure the computer, if necessary. Refer to Chapter 1, "Installation Guidelines," for more information.

Removing a Diskette Drive

To remove the diskette drive, you must first remove the side-mounted hard drive from the computer.

To remove a diskette drive:

1. Shut down the operating system properly, then turn off the computer, disconnect the power cord from the power outlet, and remove the computer cover.

2. Remove the side-mounted hard drive.

3. Disconnect the drive power cable and the signal cable.

4. Remove the retaining screw from the right side of the drive ❶.

5. Press down on the release lever below the drive ❷, and at the same time, remove the drive from the bay ❸.
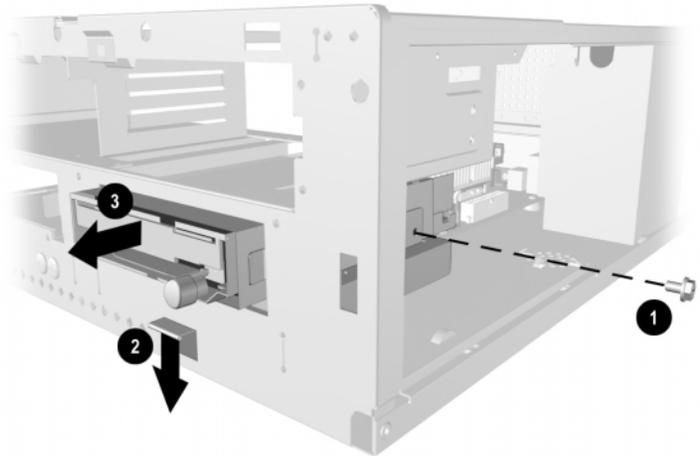
Removing a Diskette Drive

6. Store the drive in antistatic packaging.

chapter 3

HARDWARE UPGRADES: MINITOWER

Serviceability Features

Your computer includes features that make it easier to upgrade and service.

Removing the Computer Access Panel

Before removing the access panel, lay the computer down on its large base for greater stability.

1. Shut down the operating system properly, then turn off the computer and any external devices.

2. 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.

3. Loosen the two screws that secure the access panel to the computer chassis.

4. Slide the access panel back about 1 inch (2.5 cm), then lift it up and off the unit.
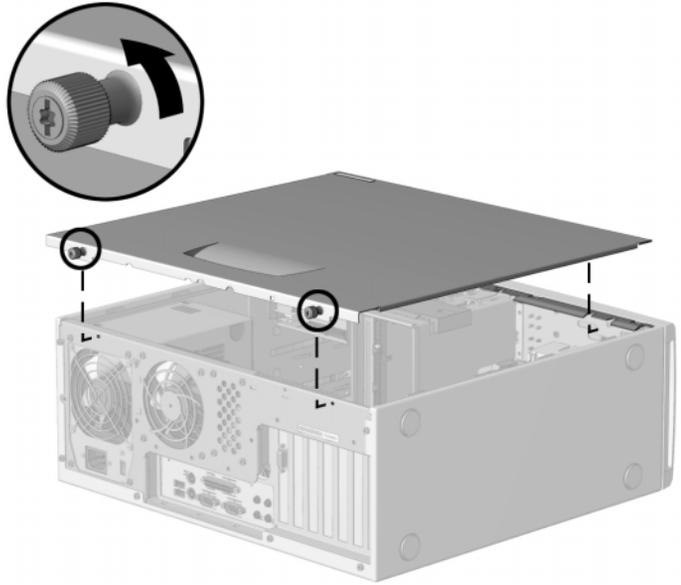
Removing the Computer Access Panel

To replace the access panel, reverse steps 1–4.

Removing the Front Bezel

1. Shut down the operating system properly, then turn off the computer and any external devices. Disconnect the power cord from the power outlet and disconnect any external devices.

2. Remove the computer access panel.

3. Push up on the two release tabs ❶ , then rotate the front bezel away from the chassis to release it ❷.
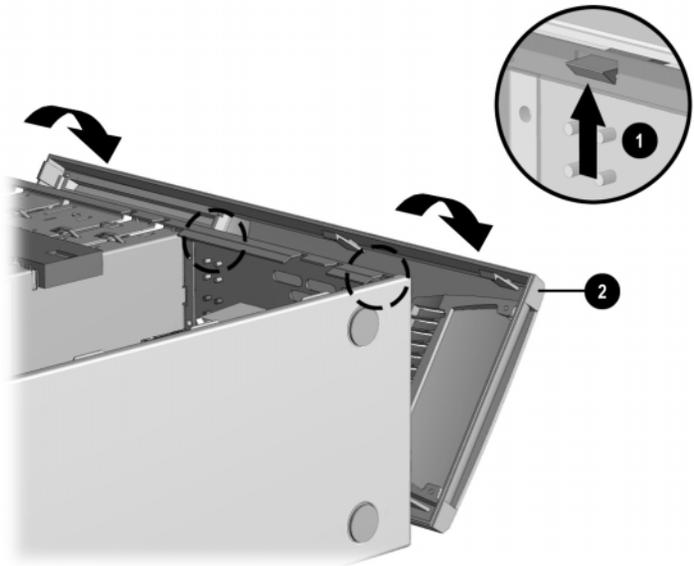
Removing the Front Bezel

✎ When replacing the front bezel, ensure that the bottom hinge points are properly placed in the chassis before rotating the front bezel back into its original position.

Removing Bezel Blanks

1. Shut down the operating system properly, then turn off the computer and any external devices. Disconnect the power cord from the power outlet and disconnect any external devices.

2. Remove the computer access panel.

3. 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.
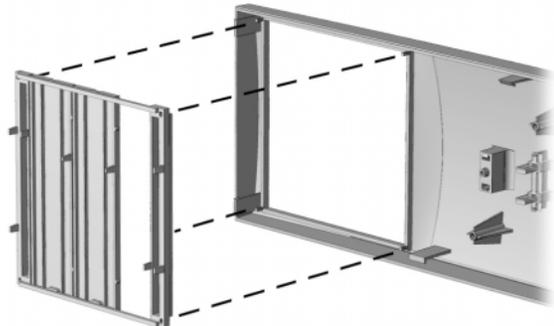
Removing Bezel Blanks from the Subpanel (Minitower Shown)

✎ When replacing the subpanel, ensure that the aligning pins and any remaining bezel blanks are in their proper orientation.

Installing Additional Memory

Depending on the model, the computer comes with:

■ Synchronous dynamic random access memory (SDRAM) dual inline memory modules (DIMMs)

■ Direct Rambus dynamic random access memory (RDRAM) Rambus inline memory modules (RIMMs)

DIMMs

The memory sockets on the Intel 815 chipset–based system board can be populated with industry-standard DIMMs. These memory module slots are populated with at least one preinstalled memory module. The computer comes with synchronous dynamic random access memory (SDRAM) dual inline memory modules (DIMMs).

To achieve the maximum memory support, you may be required to replace the preinstalled DIMM with a higher capacity DIMM.

For proper system operation, the DIMMs must be industry-standard 168-pin, 133 MHz, unbuffered, PC133–compliant SDRAM DIMMs, depending on the model. The SDRAM DIMMs must support CAS Latency 2 or 3 (CL = 2 or CL = 3). They must also contain the mandatory Joint Electronic Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information. DIMMs constructed with x4 SDRAM are not supported; the system will not start using unsupported DIMMs.

The Intel 815 chipset–based system board supports both PC100 and PC133 SDRAM DIMMs. PC133 DIMMs should be used for optimal performance. If both PC100 and PC133 SDRAM DIMMs are installed in a computer, the system memory will run at the lower 100MHz speed.

Installing DIMMs

$\triangle$ **CAUTION:** Your memory module sockets have gold metal contacts. When upgrading your 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. Refer to Appendix D, "Electrostatic Discharge," for more information.

> ⚠️ **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, use Computer Setup to unlock the lock and disable the Smart Cover Sensor.

2. Shut down the operating system properly, then turn off the computer and any external devices, then disconnect the power cord from the power outlet.

3. Remove the access panel and locate the memory module sockets.

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

4. Open both latches of the memory module socket ❶, and insert the memory module into the socket ❷.

   Begin by installing a module into the socket nearest the preinstalled module, and install the modules following the numerical order of the sockets.

   A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket. Push the module down into the socket, ensuring that the module is fully inserted and properly seated ❸.
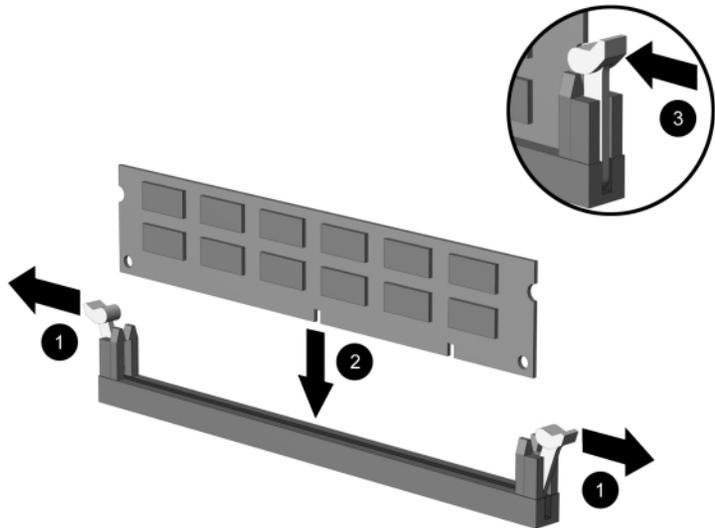
Installing a DIMM

RIMMs

The memory sockets on the Intel 850 chipset–based system board can be populated with pairs of industry-standard RIMMs. All slots must be occupied by either a memory module or a continuity module (CRIMM). RIMM upgrade kits are available as options from Compaq.

For proper system operation, the RIMMs must be industry-standard 184-pin, PC800–compliant RAMBUS memory modules, depending on the model. They must also contain the mandatory Joint Electronic Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information (1.0 or later). Intel 850 chipset–based Deskpro models have two Direct RAMBUS channels.

✎   If you install RIMMs of varying speeds, the system will run at the speed of the slowest installed RIMM.

RIMM Socket Locations

The four RIMM sockets are numbered XMM1 and XMM2 (Channel A) and XMM3 and XMM4 (Channel B).
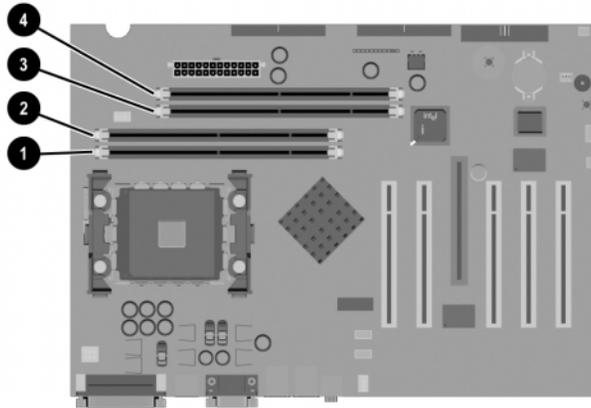
Location of RIMM sockets

❶	RIMM Socket XMM3, Channel B
❷	RIMM Socket XMM4, Channel B
❸	RIMM Socket XMM1, Channel A
❹	RIMM Socket XMM2, Channel A

Guidelines for RIMM Installation

Follow the guidelines listed below when installing RIMMs:

■ Install RIMMs in pairs across both memory channels. Each RIMM socket populated with a RIMM or CRIMM on Channel A must be populated with an identical RIMM or CRIMM on Channel B. for examples of the correct configuration sequence, refer to the section, "Installing RIMMS."

■ RIMMs must be installed correctly. Be sure to match the two key sockets on the RIMM with the tabs on the RIMM socket. Push the RIMM down into the RIMM socket, ensuring that it is fully inserted and properly seated, and that the retaining arms are locked in place.

■ CRIMMs must be installed in all empty RIMM sockets. The CRIMMs are removed when you populate the sockets with RIMMs. For examples of the correct configuration sequence, refer to the sections, "Installing RIMMs."

△ **CAUTION:** Static electricity can damage the electronic components of the workstation or optional boards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

△ **CAUTION:** The above guidelines must be followed when installing RIMMs or your workstation will not function.

△ **CAUTION:** When handling a memory module, do not touch any of the contacts. Doing so can damage the module.

Installing RIMMs

When installing RIMMs, you must use the configurations in the following table.

RIMM Installation Configurations				
	Memory Channel A		Memory Channel B	
Possible Configuration	RIMM Socket XMM1	RIMM Socket XMM2	RIMM Socket XMM3	RIMM Socket XMM4
1	RIMM	CRIMM	RIMM	CRIMM
2	RIMM	RIMM	RIMM	RIMM

✎ CRIMMs should never be installed in socket XMM1 or XMM3.

⚠ **WARNING:** To reduce the risk of personal injury when replacing or removing RIMMs, allow the module being removed from the RIMM socket sufficient time to cool. RIMM temperatures can reach 100°C (212°F).

△ **CAUTION:** Your memory module sockets have gold metal contacts. When upgrading your 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. Refer to Appendix D, "Electrostatic Discharge," for more information.

⚠ **CAUTION:** When handling a memory module, do not touch any of the contacts. Doing so can damage the module.

Before installing additional RIMMs, read "Guidelines for RIMM Installation" in this chapter.

✎ CRIMMs must be installed in all unpopulated RIMM sockets.

1. Shut down the operating system properly, then turn off the computer and any external devices, then disconnect the power cord from the power outlet.

2. Remove the access panel and locate the memory module sockets.

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

3. Open both latches of the memory module socket ❶, and insert the memory module into the socket ❷.

⚠ **CAUTION:** Be sure to follow the correct configuration guidelines respective to your memory board or your system will not function.

A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket. Push the module down into the socket, ensuring that the module is fully inserted and properly seated ❸.
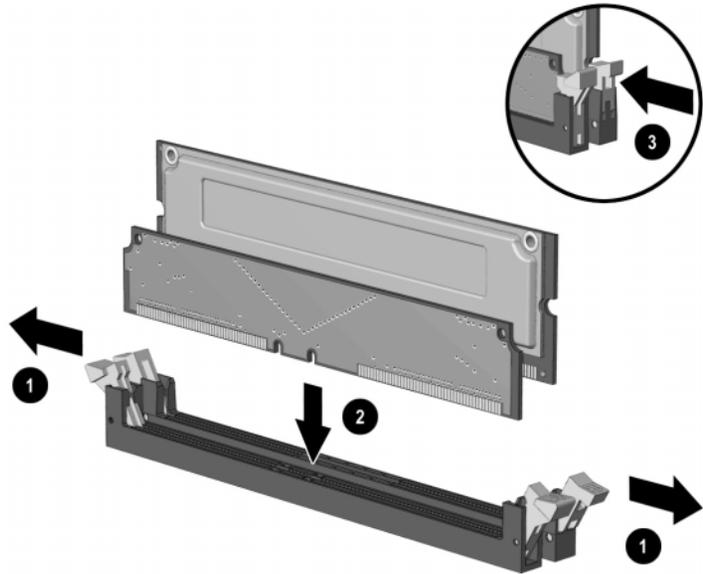
Installing a RIMM and CRIMM

Installing or Removing an Expansion Card

Your computer contains expansion slots, as shown below:
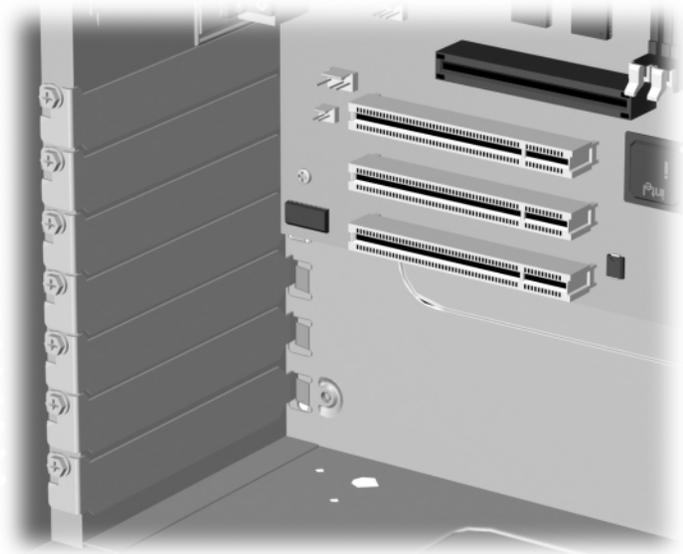
Expansion Slots (location may vary)

Removing an Expansion Slot Cover

1. Shut down the operating system properly, then turn off the computer and any external devices, then disconnect the power cord from the power outlet.

2. Remove the access panel and locate the correct vacant slot in the computer chassis.

3. Remove the screw securing the slot cover, then remove the expansion slot cover from the slot as illustrated.
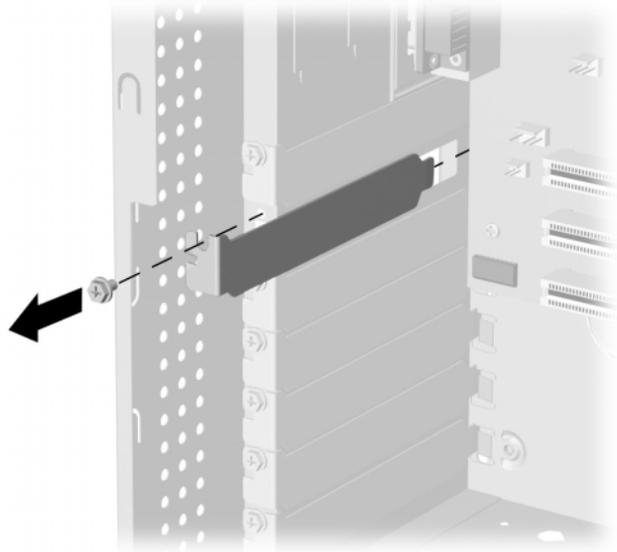
Removing the Screw and Expansion Slot Cover

Removing or Installing an Expansion Card

The computer has three PCI expansion slots and one AGP expansion slot. To install an expansion card:

1. Shut down the operating system properly, then turn off the computer and any external devices, then disconnect the power cord from the power outlet.

2. Remove the access panel.

3. If installing a new expansion card, skip to step 10.

4. To remove an installed expansion card, disconnect any cables attached to the expansion card.

5. Remove the screw at the side of the expansion slot.

6. Hold the card at each end and carefully rock it back and forth until the connectors pull free from the slot. Be sure not to scrape the card against other components.

7. Store the card in anti-static packaging.

8. You must now either install an expansion slot cover or new expansion card to close the open slot.

9. If you are not installing another card, close off the open slot by installing a slot cover with a screw.

10. If installing a new expansion card, remove the slot cover, then slide the expansion card into the expansion slot and press it firmly into place.

Removing or 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 slot.

11. Connect any cables that should be attached to the expansion card.

12. Replace the screw at the side of the expansion slot.

13. Replace the access panel.

14. Connect external cables to the installed card, if needed.

15. Reconfigure the computer, if necessary. Refer to Chapter 1, "Installation Guidelines."

Drive Positions
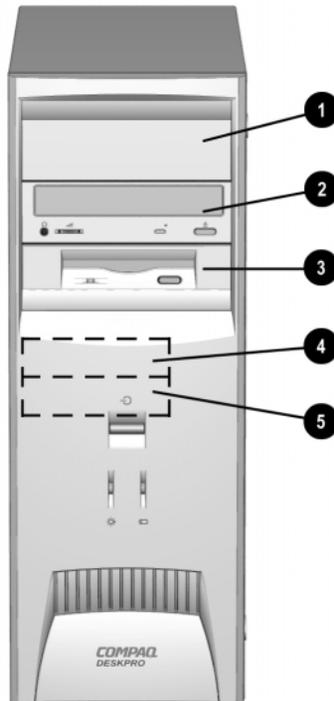
Minitower Drive Positions

❶❷   Two 5.25-inch, half-height bays for optional drives (labeled as drive bays 1 and 2)

❸   One standard 3.5-inch, 1.44-MB diskette drive mounted with a drive adapter in the 5.25-inch, one-third height bay (labeled as drive bay 3)

❹❺   Two internal 3.5-inch, one-third height bays for hard drives (labeled as drive bays 4 and 5)

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

✎   Drive bay numbers are stamped on the chassis, behind the front bezel.

Installing Additional Drives

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

When installing additional drives, follow these guidelines:

■ For optimal performance, connect hard drives to the primary controller. Connect expansion devices, such as CD-ROM, IDE tape, and diskette drives to the secondary controller.

■ 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. Compaq has provided extra guide screws, installed in the front of the computer chassis, behind the front bezel. Some options use metric hardware. The Compaq-supplied metric screws are black.

> △ **CAUTION:** To prevent loss of work and damage to the computer or drive:
>
> ■ If you are inserting or removing a hard drive, turn off the computer. 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 suitable protective packaging and label the package "Fragile: Handle With Care."

Installing a CD-ROM, DVD-ROM, Tape, or CD-RW Drive

1. Shut down the operating system properly, then turn off the computer and any external devices, disconnect the power cord from the power outlet, and remove the computer access panel.

2. Install two guide screws on each side of the drive ❶.

   ✎ Some options use metric hardware. Extra guide screws are provided on the front of the chassis, under the front bezel. The Compaq-supplied metric screws are black.

3. Install the drive in the desired drive bay by sliding it into the front of the drive cage ❷; the drivelock automatically secures the drive in the bay.

   ✎ Be sure the guide screws line up with the guide slots in the drive cage.
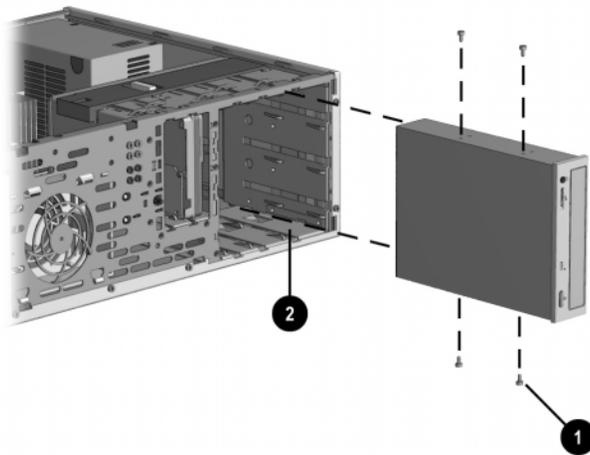
Aligning the Guide Screws and Installing an Optional 5.25-Inch Drive

4. Connect the drive power ❶ and signal ❷ cables and, if it is a CD-ROM, DVD-ROM, or CD-RW drive and if analog audio is preferred to digital audio, connect the audio cable ❸ . The other end of the audio cable ❸ should be connected to the embedded audio connector on the system board.
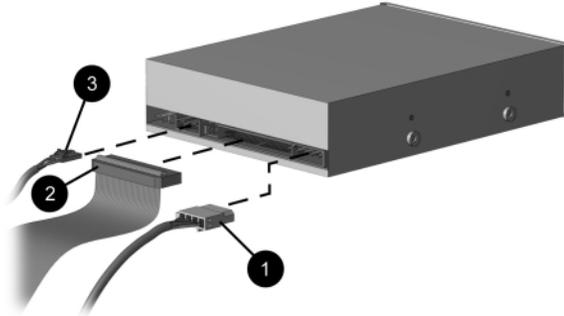
Connecting the Drive Cables

5. Remove the appropriate bezel blank from the subpanel inside the front bezel. Refer to the section "Removing Bezel Blanks" for more information.

6. Replace the computer access panel.

7. Reconfigure the computer, if necessary. Refer to Chapter 1, "Installation Guidelines," for more information.

Installing a 3.5-Inch Drive into a 5.25-Inch Drive Bay

1. Shut down the operating system properly, then turn off the computer and any external drives, disconnect the power cord from the power outlet, and remove the computer access panel.

2. Remove the front bezel.

3. Install one guide screw on the right side of the drive.

4. Insert the drive into the adapter ❷ so that the guide screw aligns in the slot, and then attach with two retaining screws.

5. Snap on the brace ❶, and attach the drive bezel ❸ to the front of the adapter.
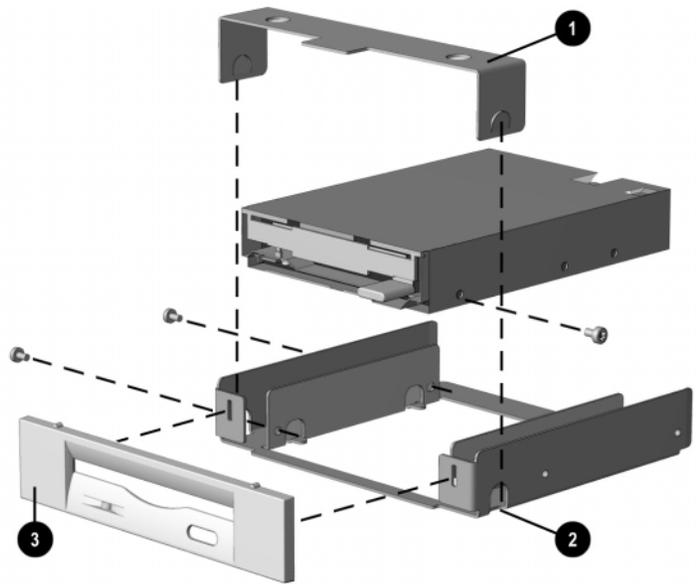
Attaching a 3.5-Inch Drive to the 5.25-Inch Adapter

6. Install two guide screws on each side of the adapter ❶.

7. Install the adapter in the desired drive bay ❷ by sliding it into the front of the drive cage; the drivelock automatically secures the adapter when it snaps into place.

✎ The primary 3.5-inch diskette drive should only be installed into bay 3.
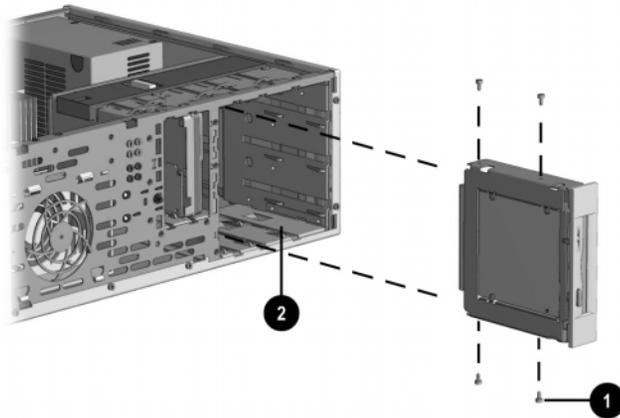
Aligning the Guide Screws and Installing an Adapter with a 3.5-Inch Drive

8. Connect the drive power ❶ and signal ❷ cables.
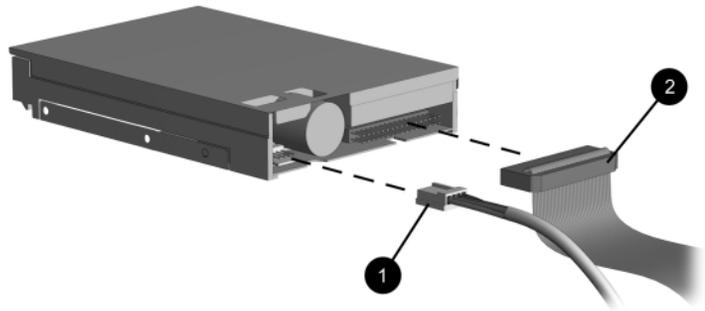
Connecting the Drive Cables

9. Remove the appropriate bezel blank from the subpanel inside the front bezel. (Refer to the section "Removing Bezel Blanks.")

10. Replace the computer access panel.

11. Reconfigure the computer, if necessary. Refer to Chapter 1, "Installation Guidelines," for more information.

Installing a Hard Drive into a 3.5-inch Drive Bay

✎ Compaq does not support mixing IDE and SCSI hard drives in the same system. If you are replacing a hard drive in bay 4 or bay 5, it should be of the same type.

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

1. Shut down the operating system properly, then turn off the computer and any external drives, disconnect the power cord from the power outlet, and remove the computer access panel.

2. Remove the front bezel.

3. Refer to the following illustrations to install a hard drive into a 3.5-inch bay.
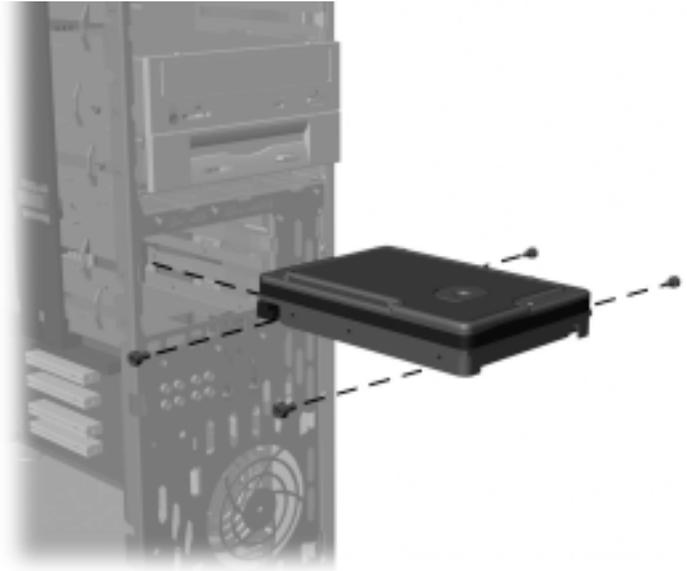
Installing a hard drive into the hard drive bay
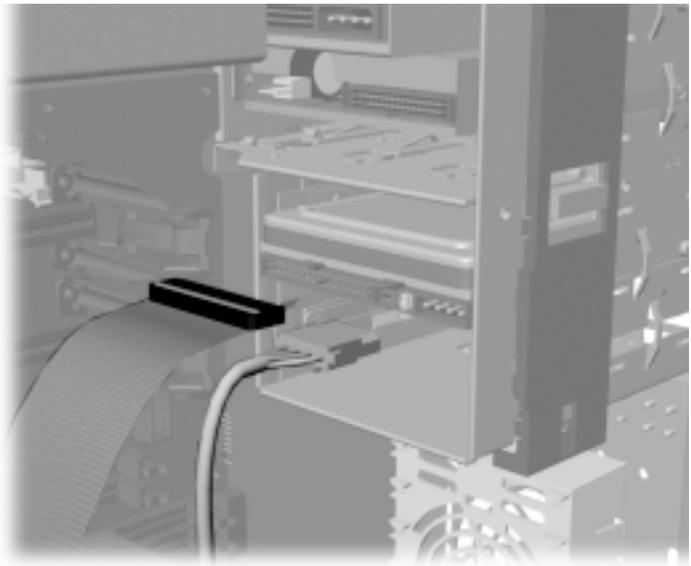
Connecting the signal cable and power cable

4. Connect the opposite end of the cables to the appropriate system board connector.

5. Replace the computer access panel.

6. Reconfigure the computer, if necessary. Refer to Chapter 1, "Installation Guidelines," for more information.

Removing a Drive from the Drive Bay

1. Shut down the operating system properly, then turn off the computer, disconnect the power cord from the power outlet, and remove the computer access panel.

2. Remove the front bezel.

3. Disconnect the drive power and signal cables and, if it is a CD-ROM, DVD-ROM, or CD-RW drive, disconnect the audio connector.

4. Press the drivelock mechanism ❶ to unlock the drive in the drive bay.
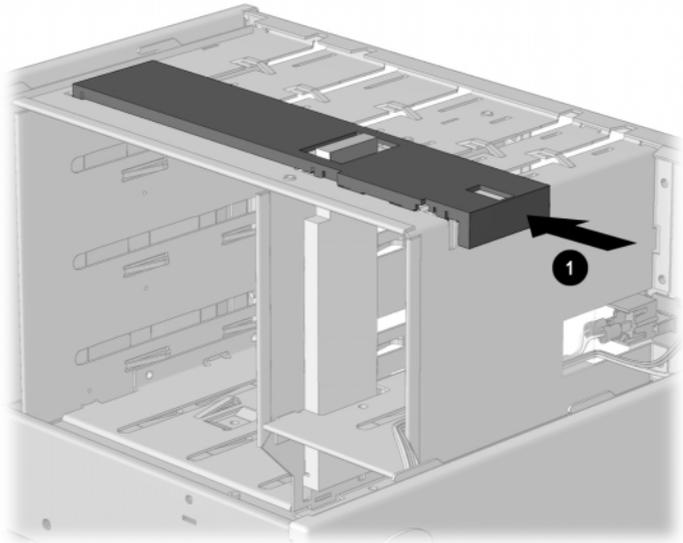
Drivelock ❶ *Secures All Drives (Shown from the Rear of the Chassis)*

5. While pressing the drivelock, pull the drive out of the drive bay.
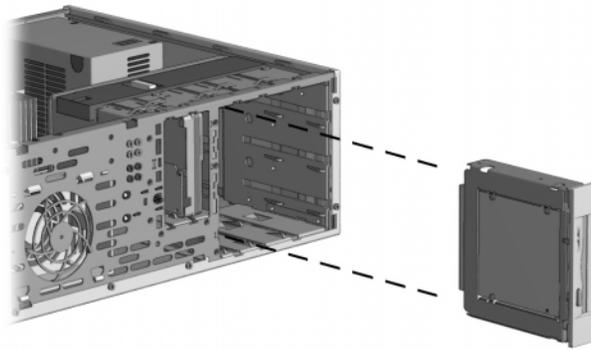
Removing a Drive from the 5.25-Inch Drive Bay

6. Remove the drive from the drive bay and store in anti-static packaging.

appendix A

SPECIFICATIONS

Compaq Deskpro EX and EXS - Desktop

Desktop Dimensions		
Height	5.1 in	12.95 cm
Width	14.5 in	36.83 cm
Depth	15.7 in	39.88 cm
Approximate Weight	13.2 lb	6.35 kg
Weight Supported (maximum distributed load)	92 lb	41.7 kg
Temperature Range		
Operating	50° to 95°F	10° to 35°C
Nonoperating	-4° to 158°F	-20° to 70°C
Relative Humidity (noncondensing)		
Operating	20-90%	20-90%
Nonoperating	5-95%	5-95%
Maximum Altitude (unpressurized)		
Operating	10,000 ft	3048 m
Nonoperating	30,000 ft	9144 m
Power Supply		
Operating Voltage Range	115 VAC	230 VAC
Rated Voltage Range	90-132 VAC	180-264 VAC
Rated Line Frequency	47-63Hz	47-63 Hz
Power Output	145 W	145 W
Rated Input Current (maximum)	4 A	2 A
Heat Dissipation		
Maximum	760 Btu/hr	192 kg-cal/hr
Nominal	380 Btu/hr	96 kg-cal/hr

Compaq Deskpro EX and EXS - Minitower (Intel 815 Chipset)

Minitower Dimensions		
Height	17.65 in	44.83 cm
Width	6.60 in	16.76 cm
Depth	17.11 in	43.46 cm
Approximate Weight	26 lb	12 kg
Weight Supported (maximum distributed load)	100.0 lb	45.5 kg
Temperature Range		
Operating	50° to 95°F	10° to 35°C
Nonoperating	-4° to 140°F	-20° to 60°C
Relative Humidity (noncondensing)		
Operating	20% to 80%	20% to 80%
Nonoperating	10% to 90%	10% to 90%
Maximum Altitude (unpressurized)		
Operating	10,000 ft	3048 m
Nonoperating	30,000 ft	9144 m
Power Supply		
Operating Voltage Range	90-132 VAC	180-264 VAC
Rated Voltage Range	100-127 VAC	200-240 VAC
Rated Line Frequency	50-60 Hz	50-60 Hz
Power Output	200 W	200 W
Rated Input Current (maximum)	6 A	3 A
Heat Dissipation		
Maximum	1050 Btu/hr	265 kg-cal/hr
Nominal	525 Btu/hr	133 kg-cal/hr

Compaq Deskpro EXS - Minitower (Intel 850 Chipset)

Desktop Dimensions		
Height	6.60 in	16.76 cm
Width	17.65 in	44.83 cm
Depth	17.11 in	43.46 cm
Minitower Dimensions		
Height	17.65 in	44.83 cm
Width	6.60 in	16.76 cm
Depth	17.11 in	43.46 cm
Approximate Weight	26 lb	12 kg
Weight Supported (maximum distributed load)	100.0 lb	45.5 kg
Temperature Range		
Operating	50° to 95°F	10° to 35°C
Nonoperating	-4° to 140°F	-20° to 60°C
Relative Humidity (noncondensing)		
Operating	20% to 80%	20% to 80%
Nonoperating	10% to 90%	10% to 90%
Maximum Altitude (unpressurized)		
Operating	10,000 ft	3048 m
Nonoperating	30,000 ft	9144 m
Power Supply		
Operating Voltage Range	90-132 VAC	180-264 VAC
Rated Voltage Range	100-127 VAC	200-240 VAC
Rated Line Frequency	50-60 Hz	50-60 Hz
Power Output	265 W	265 W
Rated Input Current (maximum)	7.5 A	3.75 A
Heat Dissipation		
Maximum	1390 Btu/hr	350 kg-cal/hr
Nominal	525 Btu/hr	133 kg-cal/hr

appendix B

HARD DRIVE INSTALLATION GUIDELINES

Using the Cable-Select Feature with Ultra ATA Devices

Optional drives are available from Compaq in kits that include a special drive cable. The configuration of the drives employs a cable-select feature that identifies the drives as device 0 (primary drive) or device 1 (secondary drive). The computer recognizes device 0 as the drive connected to the short segment of the drive cable (farthest from the system board), and device 1 as the drive connected to the long segment of the drive cable (closest to the system board).

When using an 80 conductor Ultra ATA cable, connect the colored connectors as follows:

■   blue–system board (end)

■   gray–device 1 (middle)

■   black–device 0 (end)

Drive installation requires no jumper setting changes on the existing or optional drives. All Compaq drives have the jumpers preset for cable-select installation.

✎   If installing a second device on the primary controller, you must use an 80 conductor Ultra ATA cable for optimal performance. This cable is standard on select models.

Installing SCSI Devices

Select models feature a Wide Ultra160 SCSI host adapter that supports up to fifteen wide internal and external SCSI devices. Select models come with an internal SCSI hard drive preinstalled. Additional high-performance SCSI devices can be added to these select models.

Guidelines for Installing Optional SCSI Devices

When installing additional SCSI devices, you must adhere to the following guidelines:

■ The Wide Ultra160 SCSI host adapter supports up to 15 wide SCSI devices.

■ Every SCSI device must have a unique identification (ID) number (0 - 15). The SCSI host adapter identifies signals to and from a SCSI device by its SCSI ID number rather than its location. Moving a SCSI device from one position to another on the SCSI chain does not affect the communication between the controller and the SCSI device. The reserved and available SCSI ID numbers for SCSI devices are as follows:

   ❏ 0 is reserved for the hard drive.

   ❏ 1 through 4 are available.

   ❏ 5 is reserved for a CD-ROM drive.

   ❏ 6 is available.

   ❏ 7 is reserved for the SCSI host adapter.

   ❏ 8 - 15 are available.

■ Every SCSI chain or circuit must be terminated (closed) at both ends. Termination can be accomplished by using the terminating feature on the device or by using a terminated cable.

✎ Some devices may not have terminating jumpers on the device. Termination on these devices must be achieved with terminated cable.

Turn on an external SCSI device before turning on power to the computer. This enables the system board controller to recognize the external SCSI device and automatically reset. When an external SCSI device is connected to the external SCSI connector on the rear panel of the computer, that device becomes the end of the SCSI chain and must be terminated.

■ The system accommodates a combination of internal and external SCSI devices, such as SCSI tape, CD-ROM drives, and hard drives.

✎ When an IDE hard drive and SCSI hard drive are both installed, the system can boot only from the IDE hard drive.

✎ Before you can install a SCSI device, you must first verify the SCSI ID of the device and, if necessary, set the SCSI ID to a new number. Be sure that each SCSI device on the SCSI chain has a unique SCSI ID number.

Second, you must determine if the device ought to have termination enabled or disabled. Set the termination if necessary.

Cabling for Optional SCSI Devices

Depending on the model, your computer may include one of the SCSI cables shown in the next illustration.
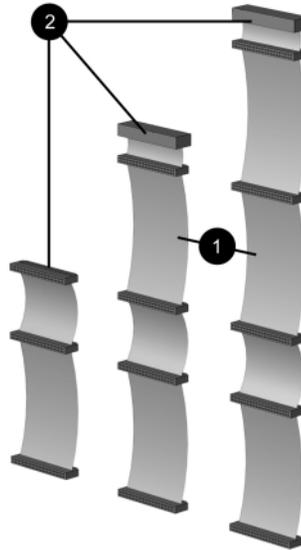
SCSI Cable Options

Because your computer comes preconfigured, cable configuration does not become a consideration until you decide to add an optional SCSI device.

❶   Computers with 2-, 3-, and 4-peripheral SCSI cables come with a terminator ❷ on the end of the cable. The connector on the opposite end of the cable always connects to the system board. All SCSI devices connected with these cables must have their termination disabled.

✎   Some devices may not have terminating jumpers on the device. Termination on these devices must be achieved with terminated cable.

When installing a SCSI device, be sure to route the SCSI cable over the expansion board cage, between the raised areas.

For additional information about installing optional SCSI devices, refer to the documentation that comes with the device or contact your Compaq authorized dealer, reseller, or service provider.

Using SCSI*Select* with SCSI Devices

The Wide Ultra160 SCSI host adapter includes the SCSI*Select* utility to configure the host adapter and to run SCSI disk utilities. To run the SCSI*Select* utility:

■ In Post Messages Enabled mode: Press Ctrl+A when the Press <Ctrl><A> for SCSISelect Utility message appears during POST.

■ In Post Messages Disabled mode: When the Compaq logo screen appears, press any key to exit the logo screen. Immediately after exiting the logo screen, press Ctrl+A to access the SCSI*Select* utility.

A menu appears with the following options:

■ **Configure/View Host Adapter Settings**

   ❏ SCSI Bus Interface Definitions

      – Host Adapter SCSI ID

      – SCSI Parity Checking

      – Host Adapter SCSI Termination

   ❏ Additional Options

      – Boot Device Options

      – SCSI Device Configuration

      – Advanced Configuration Options

■ **SCSI Disk Utilities**

   Lists all SCSI devices and SCSI ID numbers

✎ For information about configuring POST message display status, refer to the *Computer Setup* guide.

appendix C

BATTERY REPLACEMENT

The battery that comes with your computer provides power to the real-time clock and has a lifetime of about five years. When replacing the battery, use an equivalent 3-volt lithium coin cell battery.

⚠ **WARNING:** Your computer contains an internal lithium manganese dioxide, vanadium pentoxide, or alkaline battery or battery pack. There is a risk of fire and burns if the battery pack 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 only with the Compaq spare designated for this product.

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 Compaq, your authorized partners, or their agents.

1. Shut down the operating system properly, turn off the computer and any external devices, disconnect the power cord from the electrical outlet, and remove the computer cover or access panel.

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

2. Locate the battery and battery holder on the system board, as shown in the following illustration.
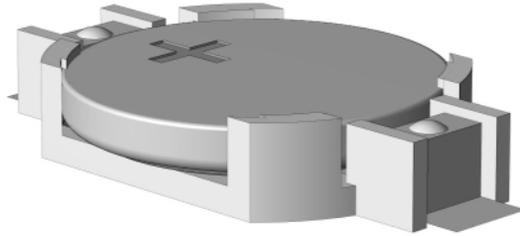
Battery and Battery Holder

3. Lift the battery out of its holder.
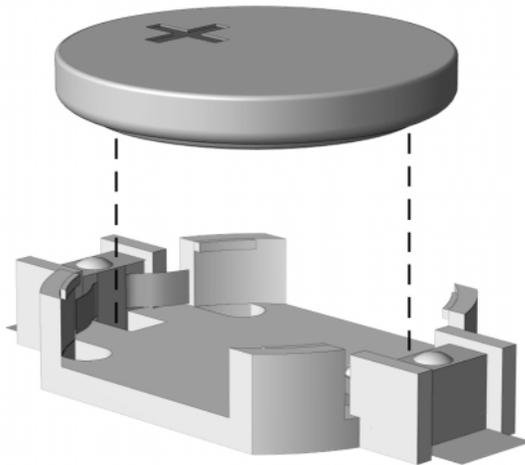
Removing the Coin Cell Battery

4. Slide the replacement battery into position, positive side up.

The battery holder automatically secures the battery in the proper position.

5. Replace the computer cover.

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 Guide* for more information.

appendix 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 Mohm +/- 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 your Compaq authorized dealer, reseller, or service provider.

✎ For more information on static electricity, contact your Compaq authorized dealer, reseller, or service provider.

appendix E

ROUTINE COMPUTER CARE AND SHIPPING PREPARATION

Routine Computer Care

Follow these suggestions to take care of your computer and monitor:

■ Operate the computer on a sturdy, level surface. Leave a 3-inch (7.6-cm) clearance at the back of the system unit and above the monitor to permit the required airflow.

■ Never operate the computer with the cover or side panel removed.

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

■ Never use a desktop computer on its side (resembling a "tower" configuration).

■ 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 your computer, refer to Appendix A, "Specifications," in this guide.

■ Keep liquids away from the computer and keyboard.

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

■ 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 the front and back of the computer. Lint and other foreign matter can block the vents and limit the airflow.

CD-ROM Drive Precautions

Be sure to observe the following guidelines while operating or cleaning your CD-ROM 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 Compaq service provider.

Shipping Preparation

Follow these suggestions when preparing to ship your computer:

1. Back up the hard drive files onto PD discs, tape cartridges, 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, refer to Appendix A, "Specifications," in this guide.

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