CHAPTER 9
Installing Drives

Your Dell computer has seven drive bays for installing the following types of drives (see Figure 9-1):

- The externally accessible drive bays at the front of the computer consist of three 3.5-inch drive bays that accommodate one 3.5-inch diskette drive (standard) and two other half-height, 5.25-inch devices—typically a CD-ROM drive and a tape drive.
- The four-bay hard-disk drive cage below the externally accessible bays can hold up to four 1-inch small computer system interface (SCSI) hard-disk drives installed vertically.

The next section contains information that you will need in several of the installation procedures described later in the chapter. The remaining sections of this chapter cover each type of drive installation.

NOTE: In all of the following procedures, ***left*** *and* ***right*** *refer to your left and right as you face the* ***front*** *of the computer.*

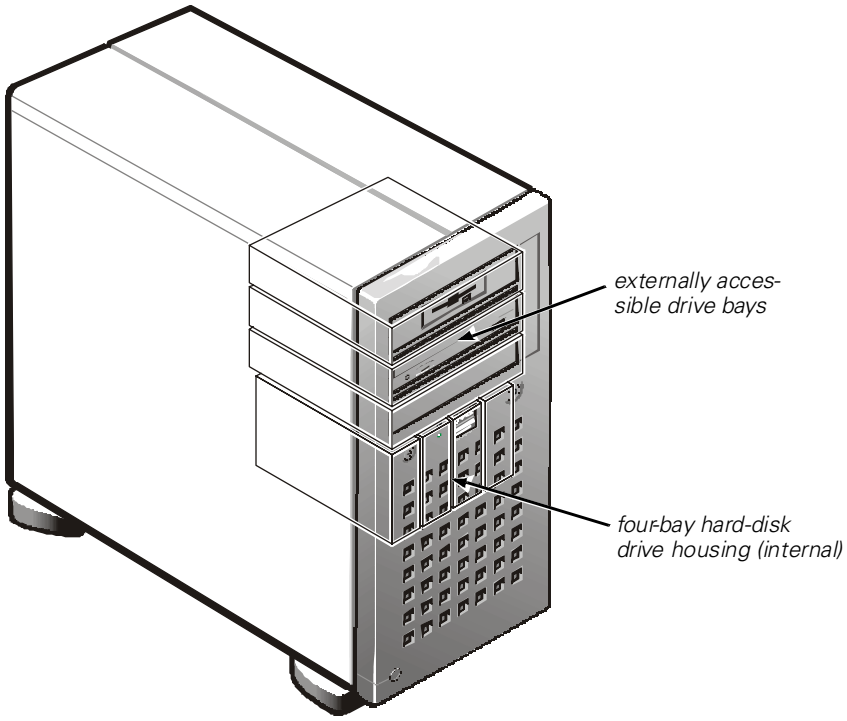

Figure 9-1. Drive Locations

Connecting Drives

When installing a drive, you connect two cables—a DC power cable and an interface cable—to the back of the drive. Your drive's power input connector (to which you connect the DC power cable) resembles the connector shown in Figure 9-2.

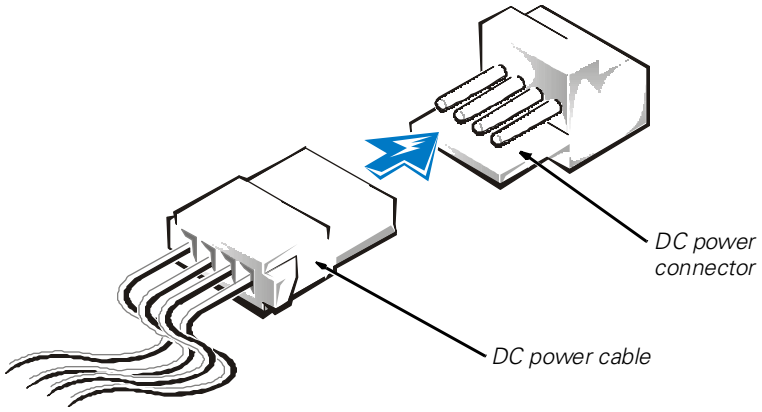

Figure 9-2. DC Power Cable Connector

The drive's interface connector is a card-edge connector or a header connector, as shown in Figure 9-3.

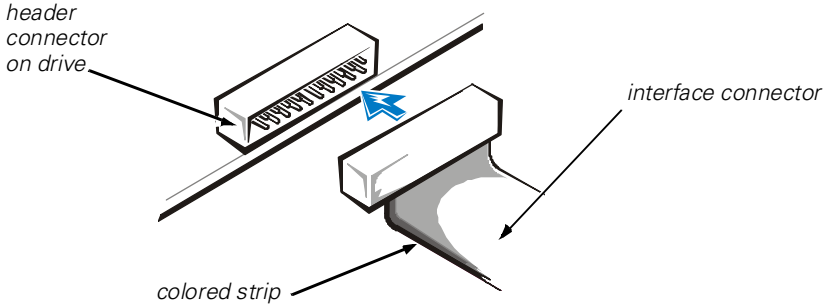

Figure 9-3. Drive Interface Connectors

When attaching the interface cable to a drive, be sure to match the colored strip on the cable to pin 1 of the drive's interface connector. For the location of pin 1 on the drive's interface connector, see the documentation that came with the drive.

When disconnecting an interface cable from the system board, be sure to press in on the locking tabs on the cable connector (if any) before disconnecting the cable. When attaching an interface cable to the system board, be sure that the locking tabs snap into place, ensuring that the cable is firmly attached to the connector on the system board.

Most interface connectors are keyed for correct insertion; that is, a notch or a missing pin on one connector matches a tab or a filled-in hole on the other connector as shown in Figure 9-3. Keying ensures that the pin-1 wire in the cable (indicated by the colored strip along one edge of the cable) goes to the pin-1 end of the cable.

The pin-1 end of a connector on a board or a card is usually indicated by a silk-screened "1" printed directly on the board or card.

NOTICE: When connecting an interface cable, do not reverse the interface cable (do not place the colored strip away from pin 1 of the connector). Reversing the cable prevents the drive from operating and could damage the controller, the drive, or both.

Installing a Drive in a 5.25-Inch Drive Bay

The 5.25-inch drive bays can accommodate any of the following types of half-height drives:

- The 3.5-inch diskette drive that comes standard with the system (encased in a 5.25-inch housing)
- A CD-ROM drive that uses the integrated enhanced integrated drive electronics (EIDE) controller
- A SCSI tape drive that uses either the integrated SCSI controller or an add-in SCSI adapter card
- Any 5.25-inch device that uses its own controller card

NOTE: For information on configuring, connecting, and installing SCSI drives, see "Installing SCSI Devices," later in this chapter.

To install a drive in a 5.25-inch drive bay, perform the following steps:

1. Unpack the drive and prepare it for installation.

   NOTICE: Ground yourself by touching an unpainted metal surface on the back of the computer.

   Check the documentation that accompanied the drive to verify that the drive is configured for your computer system. Change any settings necessary for your configuration. If you are installing an EIDE CD-ROM drive, configure the drive for the cable select setting. If you are installing a SCSI device, make sure the device has termination disabled. See "Installing SCSI Devices," later in this chapter.

2. Remove the computer cover as instructed in "Removing the Computer Cover" in Chapter 7.

   NOTICE: See "Protecting Against Electrostatic Discharge" in the safety instructions at the front of this guide.

3. Remove the front bezel according to the instructions in "Removing and Replacing the Front Bezel," in Chapter 7.

4. Remove the drive bracket from the bay you want to use. Squeeze the metal tabs that extend from each side of the drive bracket toward each other, and pull the bracket out of the bay (see Figure 9-4).

NOTE: For easier access inside the chassis, you may want to temporarily rotate the power supply out of the way. To do so, see "Rotating the Power Supply Away From the System Board" in Chapter 7.

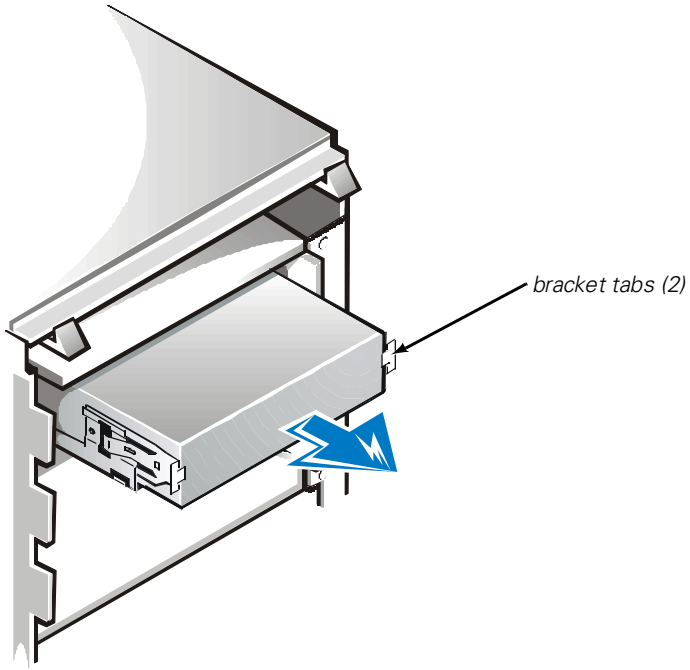

Figure 9-4. Removing a Drive

If a drive is already installed in the bay and you are replacing it, be sure to disconnect the DC power cable and interface cable from the back of the drive before sliding the bracket out of the bay. To remove the old drive from the bracket, turn the drive/bracket assembly upside down and unscrew the four screws that secure the drive to the bracket (see Figure 9-5).

5. Attach the bracket to the new drive.

Turn the drive upside down as shown in Figure 9-5, and locate the four screw holes around its perimeter. Fit the bracket over the drive, and then tilt the front of the drive up so that the bracket drops down into place. To ensure proper installation, all screw holes should be aligned and the tabs on the front of the bracket should be flush with the front of the drive.

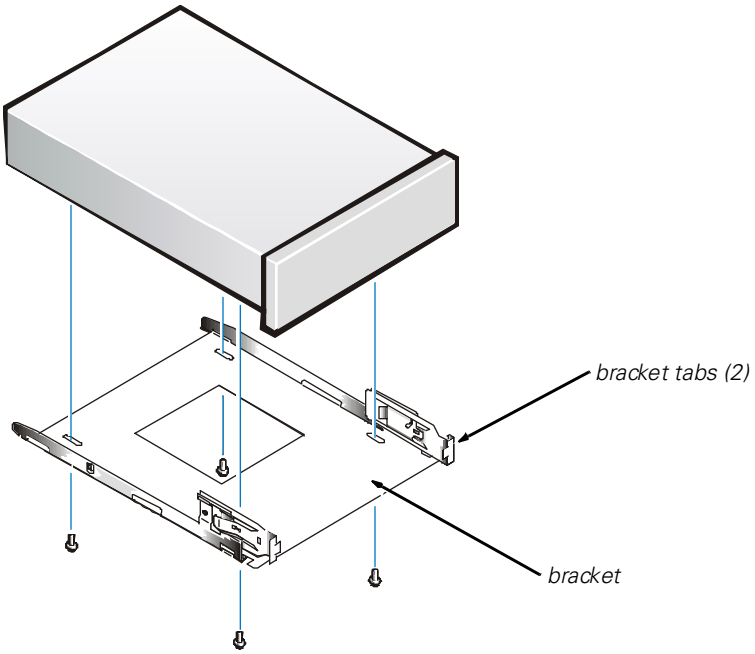

Figure 9-5. Attaching the Drive Bracket to the New Drive

To further ensure proper positioning of the drive in the chassis, insert and tighten all four screws *in the order in which the holes are numbered* (the holes are marked "1" through "4").

6. Slide the new drive into the drive bay until it snaps securely into place (see Figure 9-6). Make sure that both bracket tabs snap into place in the drive bay.

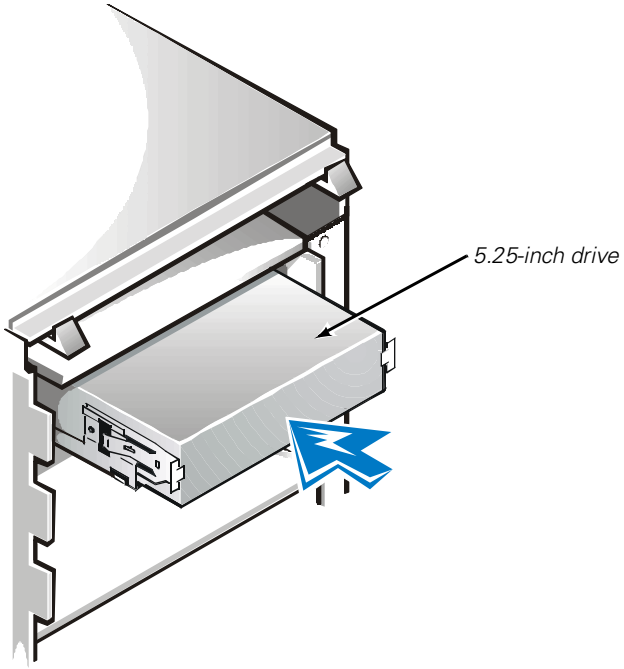

Figure 9-6. Inserting the New Drive Into the Drive Bay

7. If you are installing a drive that has its own controller card, install the controller card in an expansion slot.

   See "Installing an Expansion Card," in Chapter 8.

8. Connect a DC power cable to the power input connector on the back of the drive (see Figure 9-7).

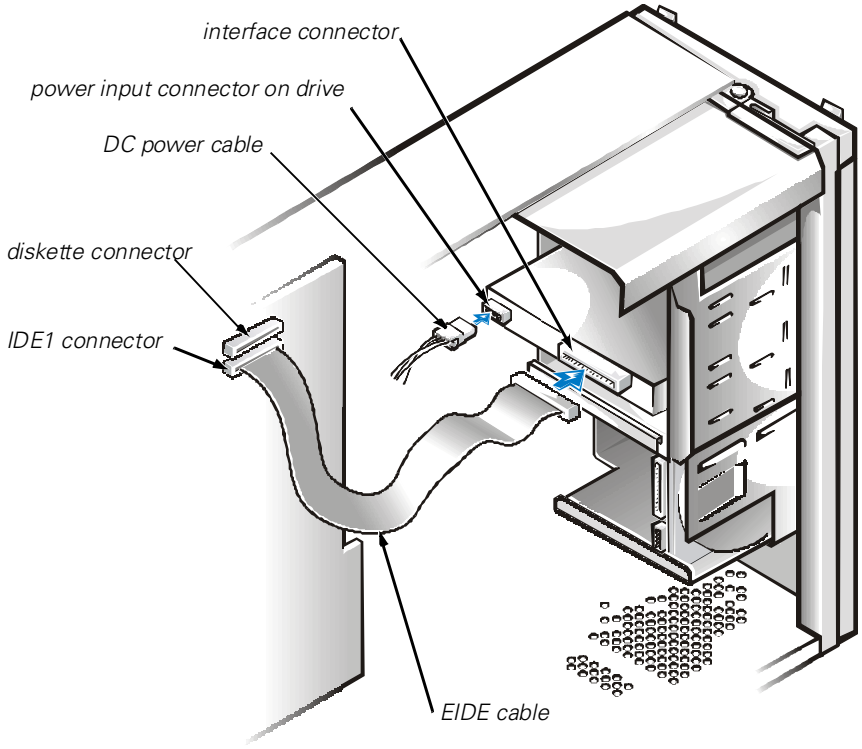

Figure 9-7. Attaching EIDE CD-ROM Drive Cables

9. Connect the appropriate interface cable to the interface connector on the back of the drive (see Figure 9-7). If your system came with an EIDE CD-ROM drive, use the spare connector on the existing interface cable. Otherwise, use the EIDE or SCSI cable provided in the drive kit.

   NOTICE: You must match the colored strip on the cable with pin 1 on the drive's interface connector to avoid possible damage to your system.

10. Connect the other end of the interface cable as follows (see Figure 8-1 to identify system board connectors).

    For an EIDE CD-ROM drive, connect the other end of the interface cable to the interface connector labeled "IDE1" on the system board.

    For a SCSI drive, connect the cable from the drive to the interface connector labeled "SCSI" on the system board or to an add-in SCSI adapter.

    For a diskette drive, connect the cable from the drive to the interface connector labeled "DISKETTE" on the system board. Make sure that the end connector located closest to the twist in the cable is connected to the diskette drive.

For a drive that comes with its own controller card, connect the other end of the interface cable to the controller card.

Check all cable connections. Fold cables out of the way to provide airflow for the fan and cooling vents.

11. If the 5.25-inch drive bay was previously empty, remove the front-panel insert from the front bezel.

    See "Removing and Replacing Front-Panel Inserts," in Chapter 7.

12. Replace the front bezel according to the instructions in "Removing and Replacing the Front Bezel," in Chapter 7.

13. Replace the computer cover, and reconnect your computer and peripherals to their power sources and turn them on.

NOTE: After you remove and replace the chassis, the chassis intrusion detector will cause the following message to be displayed at the next system start-up:

```
ALERT! Cover was previously removed.
```

14. To reset the chassis intrusion detector, enter the System Setup program.

    See your *User's Guide* for instructions on using the System Setup program.

NOTE: If a setup password has been assigned by someone else, contact your network administrator for information on resetting the chassis intrusion detector.

15. Update your system configuration information.

    For a diskette drive, update the diskette drive category of the System Setup screens to reflect the size and capacity of your new diskette drive. (For more information, see your *User's Guide*.)

    For EIDE CD-ROM drives, set the appropriate category for IDE drives.

16. Verify that your system works correctly.

    See Chapter 5, "Running the Dell Diagnostics," for troubleshooting any problems that may occur. Use the following guidelines to determine which test to use:

    - If you installed a diskette drive, test it by running all of the subtests in the diskette drive tests in Dell Diagnostics.
    - If you installed a CD-ROM drive, see the documentation that came with the drive for instructions on loading device drivers and using the drive. If it is an EIDE CD-ROM drive, test it by running all of the tests for IDE drives in Dell Diagnostics.
    - If you installed a tape drive, perform a tape backup and verification test with the drive as instructed in the tape-drive software documentation that came with the tape drive.

NOTE: The tape drives sold by Dell come with their own operating software and documentation. After you install a tape drive, refer to the documentation that came with the drive for instructions on installing and using the tape drive software.

Installing a Hard-Disk Drive in the Internal Hard-Disk Drive Cage

Install a hard-disk drive in the hard-disk drive cage as follows:

1. Remove the computer cover as instructed in "Removing the Computer Cover," in Chapter 7.

   NOTICE: See "Protecting Against Electrostatic Discharge" in the safety instructions at the front of this guide.

2. Remove the front bezel according to the instructions in "Removing and Replacing the Front Bezel," in Chapter 7.

3. Open the drive cage door.

   If any hard-disk drives are already installed in the bracket, disconnect the DC power cable and interface cable from each drive.

   Grasp the handle of the drive bay door on the front of the chassis, and pull out and down until the arms on the drive cage door (see Figure 9-8) disengage from the tabs on the bracket. This action pulls the cage out of the drive bay about 1 to 3 inches.

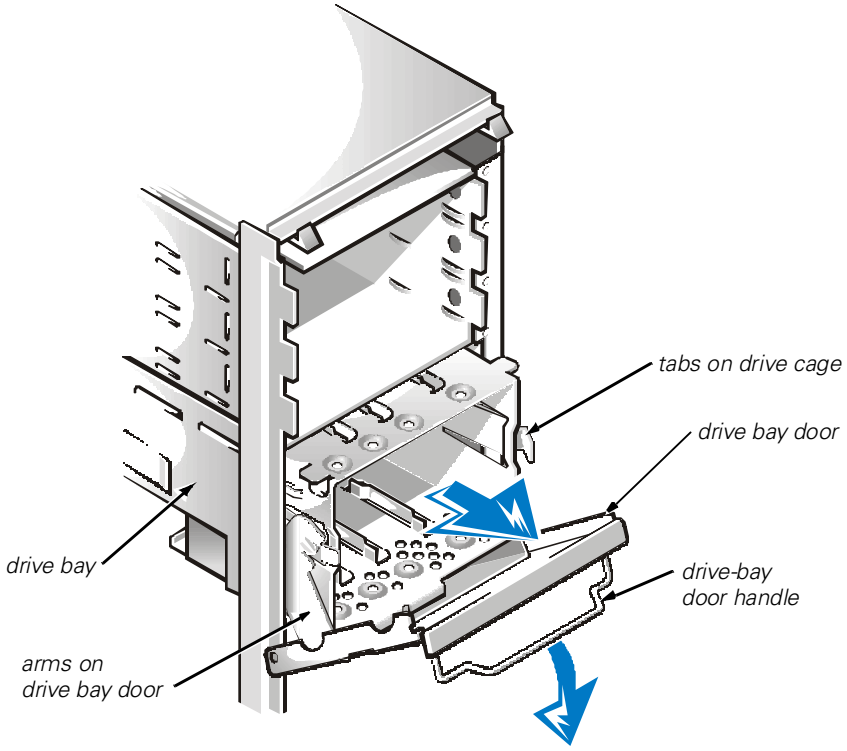

Figure 9-8. Removing the Hard-Disk Drive Cage

4. Remove the cage from the drive bay.

5. Slide the drive into the chosen slot in the cage, orienting it so that the connectors on the back of the drive face the inside of the chassis when the cage is reinstalled (see Figure 9-9).

6. Align the four screw holes of the drive and cage as shown in Figure 9-9. Insert and tighten the screws that came with your upgrade kit.

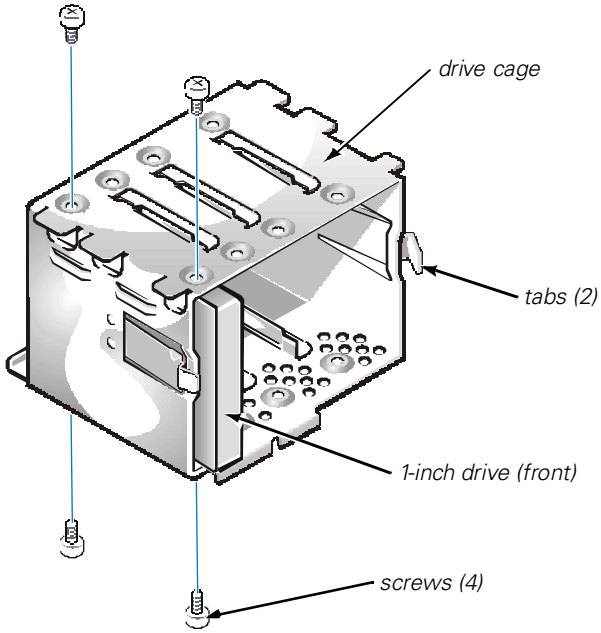

Figure 9-9. Inserting a Hard-Disk Drive Into the Drive Cage

7. Reinstall the hard-disk drive cage in the chassis (see Figure 9-10).

   Insert the cage into the drive bay by sliding it in until the tabs snap into place. Rotate the drive cage door up and toward the chassis until it snaps securely into place. Be sure to fold down the drive-bay door handle (see Figure 9-8) so that the bezel can be replaced on the chassis.

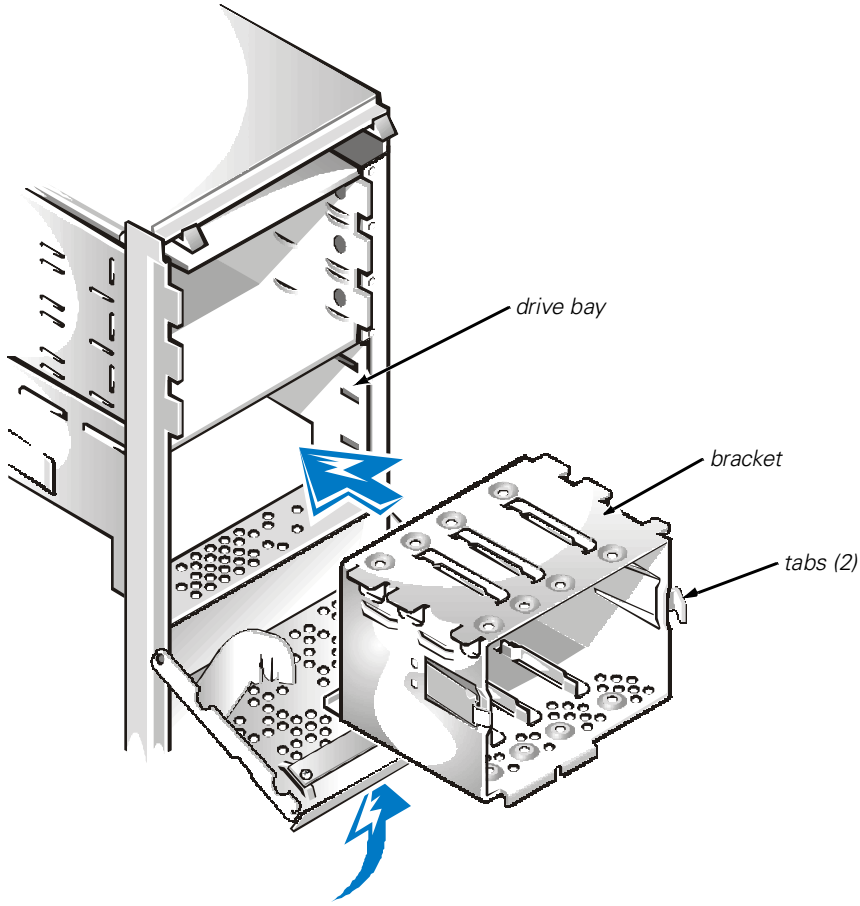

Figure 9-10. Inserting the Hard-Disk Drive Cage Into the Chassis

Installing SCSI Devices

This section describes how to configure and install SCSI devices in your computer system.

SCSI Configuration Guidelines

Although SCSI devices are installed essentially the same way as other devices, their configuration requirements are different. For details on configuring your particular SCSI subsystem, refer to the documentation that came with your SCSI devices and/or your host adapter card. The following subsections offer some general guidelines.

SCSI ID Numbers

Internal SCSI devices attached to the integrated Ultra 3 SCSI controller through the 68-pin primary SCSI connector on the system board must have a unique SCSI ID number from 0 to 15.

When SCSI devices are shipped from Dell, the default SCSI ID numbers are assigned as follows:

- The integrated Ultra 3 controller is configured through the computer's basic input/output system (BIOS) as SCSI ID 7.
- The first internal SCSI hard-disk drive is configured as SCSI ID 0. (The drive used to boot your system should always be configured as SCSI ID 0.)
- A SCSI tape drive attached to the SCSI integrated controller or the controller card is normally configured as SCSI ID 6, but can be configured to any unused SCSI ID.

NOTE: There is no requirement that SCSI ID numbers be assigned sequentially or that devices be attached to the cable in order by ID number.

SCSI devices installed by Dell are configured correctly during the manufacturing process. You do not need to set the SCSI ID for these SCSI devices.

If you attach additional optional SCSI devices, refer to the documentation that came with each device for information about setting the appropriate SCSI ID number.

NOTICE: Dell recommends that you use only SCSI cables purchased from Dell. SCSI cables purchased elsewhere are not guaranteed to work with Dell PowerEdge computer systems.

Device Termination

SCSI logic requires that termination be enabled for the two devices at opposite ends of the SCSI chain and disabled for all devices in between. However, because both SCSI controllers are self-terminating and because all internal SCSI cables provided by Dell have active termination at the end of the cables, any SCSI devices you install should have termination disabled on the devices.

Furthermore, when attaching external SCSI devices, you should use only external SCSI cables with active termination on the cable. When used with this type of cable, all external SCSI devices also need to have termination disabled on the devices.

See the documentation provided with any optional SCSI device you purchase for information on disabling termination on the device.

SCSI Cables

The 68-pin (internal) SCSI cable in your system connects SCSI devices (normally SCSI hard-disk drives) to the integrated Ultra3 controller.

- The connector at the end of the cable attaches to the Ultra3 primary SCSI controller connector labeled "SCSI1" on the system board.

- The other connectors on the cable are used for attaching up to four SCSI hard-disk drives in the internal drive bays (see Figure 9-11). When the integrated SCSI controller is not being used for hard-disk drives, it can be attached to a SCSI tape drive.

Refer to the documentation that came with the external SCSI device for information on how to connect the device, set its SCSI ID, and disable termination.

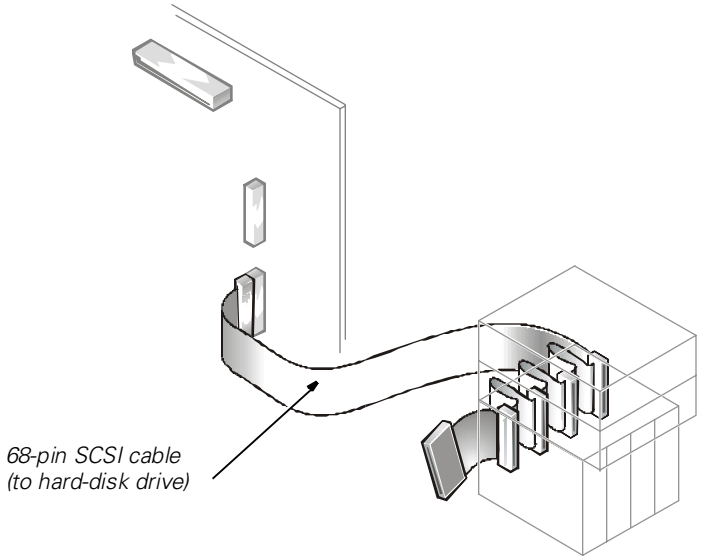

Figure 9-11. SCSI Cable

General Procedure for Installing SCSI Devices

Configure and install one or more SCSI devices in your computer as follows:

1. Determine which connector on the internal SCSI cable you will attach to each SCSI device.

   See "SCSI Configuration Guidelines," earlier in this chapter.

2. Unpack each SCSI device and prepare it for installation.

   NOTICE: Ground yourself by touching an unpainted metal surface on the back of the computer.

   NOTICE: When you unpack the drive, do not set it on a hard surface, which may damage the drive. Instead, set the drive on a surface, such as a foam pad, that will sufficiently cushion it.

   Configure the device for a SCSI ID number and disable termination, if necessary. For instructions, see the documentation that came with the SCSI device as well as "SCSI Configuration Guidelines," earlier in this chapter.

3. Install the SCSI devices as appropriate.

   - *To install a SCSI hard-disk drive*, complete the steps in "Installing a Hard-Disk Drive in the Internal Hard-Disk Drive Cage," earlier in this chapter. Then continue with step 4 of this procedure.
   - *To install a SCSI tape drive or DAT drive,* complete steps 2 through 6 of "Installing a Drive in a 5.25-Inch Drive Bay," earlier in this chapter. Then continue with step 4 of this procedure.
   - *If you are installing a SCSI host adapter card,* configure the card and install it in an empty expansion slot (see "Installing an Expansion Card," in Chapter 8). If you attach any SCSI hard-disk drives to the host adapter card, connect the hard-disk drive access cable to the SCSI host adapter card and to the AUX_LED connector on the system board (see Figure 8-1).

4. Attach the SCSI cable to each SCSI device.

   For additional instructions on connecting SCSI devices, see "SCSI Cables," earlier in this chapter.

   If you are installing an internal SCSI device, firmly press the SCSI cable's header connector onto the 68-pin connector on the back of the device.

   NOTICE: You must match the colored strip on the cable with pin 1 on the drive's interface connector to avoid possible damage to your system.

5. Connect a DC power cable to the power input connector on the SCSI device.

   Check all other cable connections. Fold all internal cables out of the way to provide airflow for the fan or cooling vents.

6. If you installed an externally accessible device, remove the front bezel and remove the front-panel insert for the drive bay from the front bezel. Then replace the front bezel.

   For instructions, see "Removing and Replacing the Front Bezel" and "Removing and Replacing Front-Panel Inserts," in Chapter 7.

7. Replace the computer cover. Then reconnect your computer and peripherals to their power sources, and turn them on.

NOTE: After you remove and replace the cover, the chassis intrusion detector will cause the following message to be displayed at the next system start-up:

```
ALERT! Cover was previously removed.
```

8. To reset the chassis intrusion detector, enter the System Setup program.

   See your *User's Guide* for instructions on using the System Setup program.

NOTE: If a setup password has been assigned by someone else, contact your network administrator for information on resetting the chassis intrusion detector.

9. If necessary, update the drive system configuration information in the System Setup program. For instructions, see your *User's Guide* for instructions on using the System Setup program.

10. If you installed a SCSI hard-disk drive, partition and format the drive. Then install the operating system.

    For instructions, see "Partitioning and Formatting SCSI Hard-Disk Drives," in the next section and your operating system documentation.

11. Test the SCSI devices.

    Test a SCSI hard-disk drive by running the SCSI diagnostics. See Chapter 5, "Running the Dell Diagnostics" for information on running the Dell Diagnostics and troubleshooting any problems that may occur.

    To test a SCSI tape drive, refer to the documentation for the tape drive software to perform a tape drive backup and verification test.

Partitioning and Formatting SCSI Hard-Disk Drives

You may need to use different programs than those provided with the operating system to partition and format SCSI hard-disk drives. Refer to the documentation that came with your SCSI software drivers for information on installing the appropriate drivers and preparing your SCSI hard-disk drive for use.

NOTE: When using the Windows NT operating system with the FAT 16 file system, the primary partition for each hard-disk drive can be no larger than 2 GB. Extended partitions can be larger than 2 GB, but each logical drive within an extended partition must be no larger than 2 GB.