



DellTM PrecisionTM WorkStation 620 Systems Service Manual

[Removing and Replacing Parts](#)

 **NOTE:** You can obtain the latest version of this document from the Support section of the Dell Web site at <http://www.dell.com>.

Model WCP

Notes, Notices, and Cautions

Throughout this guide, blocks of text may be accompanied by an icon and printed in bold type or in italic type. These blocks are notes, notices, and cautions, and they are used as follows:

 **NOTE:** A **NOTE** indicates important information that helps you make better use of your system.

NOTICE: A **NOTICE** indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **CAUTION:** A **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Information in this document is subject to change without notice.
© 2000 Dell Computer Corporation. All rights reserved.

Reproduction in any manner whatsoever without the written permission of Dell Computer Corporation is strictly forbidden.

Trademarks used in this text: *Dell Precision* and the *DELL* logo are trademarks of Dell Computer Corporation; *Microsoft* and *Windows NT* are registered trademarks of Microsoft Corporation; *Intel* and *Pentium* are registered trademarks and *Xeon* is a trademark of Intel Corporation.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Computer Corporation disclaims any proprietary interest in trademarks and trade names other than its own.

Initial release: 8 Feb 2000
Last revised: 26 Oct 2000

[Back to Contents Page](#)

Removing and Replacing Parts: Dell Precision™ WorkStation 620 Systems Service Manual

- [Overview](#)
- [Recommended Tools](#)
- [Precautionary Measures](#)
- [Restarting the System](#)
- [Computer Cover](#)
- [Interior Service Label](#)
- [Internal View](#)
- [Front Panel](#)
- [Front-Panel Inserts](#)
- [Drives](#)
- [AGP Pro Card Brace](#)
- [Expansion Cards](#)
- [Expansion-Card Guide and Fan](#)
- [Control Panel](#)
- [Chassis Intrusion Switch](#)
- [Power Supply](#)
- [System Board Components](#)
- [Memory](#)
- [Microprocessor/Heat Sink Assembly](#)
- [Cooling Fan](#)
- [Battery](#)
- [System Board](#)

Overview

This section provides procedures for removing and replacing the components, assemblies, and subassemblies in the Dell Precision WorkStation 620 system.

Unless otherwise noted, each procedure assumes that the following conditions exist:

- 1 You have performed the steps in "[Precautionary Measures](#)."
- 1 You have [removed the computer cover](#).
- 1 You can replace or reinstall a part by performing the removal procedure in reverse order unless additional information is provided.

Recommended Tools

Most of the procedures in this file require the use of one or more of the following tools:

- 1 Wide flat-blade screwdriver
- 1 #2 Phillips-head screwdriver
- 1 1/4-inch nut driver
- 1 A wrist grounding strap as explained in "[Precautionary Measures](#)."

Precautionary Measures

Before you perform any procedure in this section, take a few moments to read the following caution for your personal safety and to prevent damage to the system from electrostatic discharge (ESD).



CAUTION: FOR YOUR PERSONAL SAFETY AND PROTECTION OF THE EQUIPMENT

Before you start to work on the system, perform the following steps in the sequence listed:

1. Turn off the computer and all peripherals.

2. Disconnect the computer and peripherals from their AC power sources. Also, disconnect any telephone or telecommunication lines from the computer. Doing so reduces the potential for personal injury or shock.
3. To avoid possible damage to the system board, unplug the computer system and wait 15 to 30 seconds before removing a component from the system board or disconnecting a peripheral from the computer.
4. Wear a wrist grounding strap, and clip it to an unpainted metal surface, such as the padlock loop on the back of the chassis. If a wrist grounding strap is not available, touch any unpainted metal surface on the back of the computer or on the computer chassis, such as the power supply, to discharge any static charge from your body before touching anything inside the computer. While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might harm internal components. Also avoid touching components or contacts on a card and avoid touching pins on a chip.
5. Verify that the standby power light-emitting diode (LED) is off—wait 15 to 30 seconds for it to go out (see [Figure 28](#)).

Restarting the System

To restart the system and reset the chassis intrusion detector, perform the following steps:

1. Replace the computer cover and reconnect the 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:

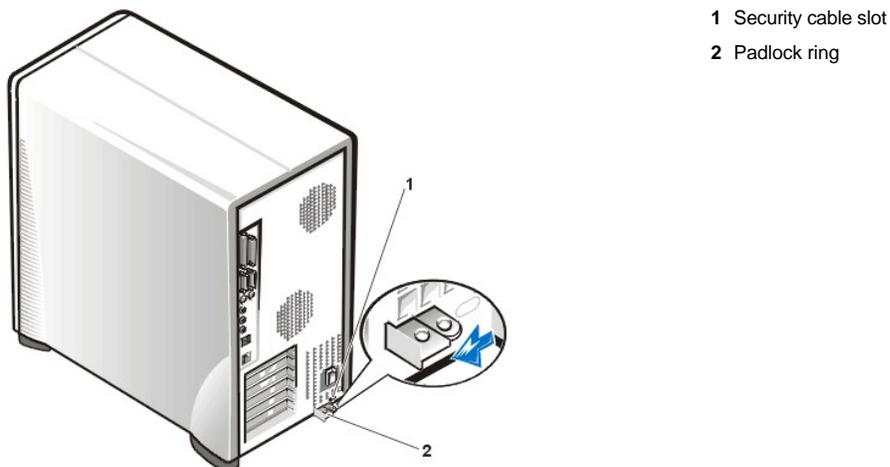
```
ALERT! Cover was previously removed.
```

2. To reset the chassis intrusion detector, enter System Setup, select **System Security**, and reset **Chassis Intrusion** to **Enabled, Enabled-Silent, or Disabled**.

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

Computer Cover

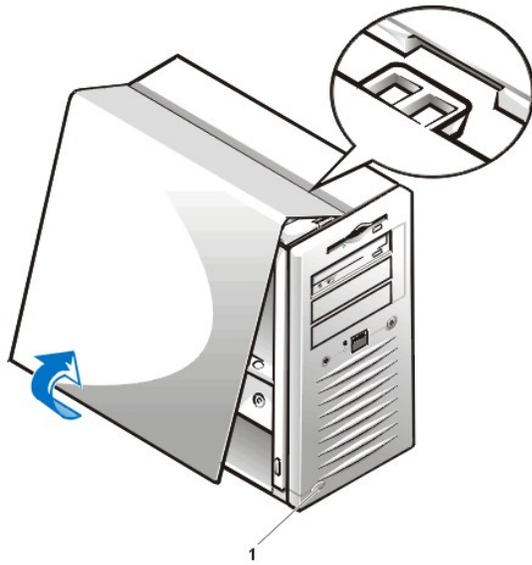
Figure 1. Padlock Ring Release



To remove the computer cover, perform the following steps:

1. Turn off your computer and peripherals, and observe the *Caution for Your Personal Safety and Protection of the Equipment* described in "[Precautionary Measures](#)."
2. If you have installed a padlock through the padlock ring on the back panel, remove the padlock.
3. Face the back of the computer and slide the upper half of the padlock ring to the left to unlock the cover release mechanism (see [Figure 1](#)).
4. Face the left side cover and press the release button (located at the bottom-left corner of the front panel) (see [Figure 2](#)).

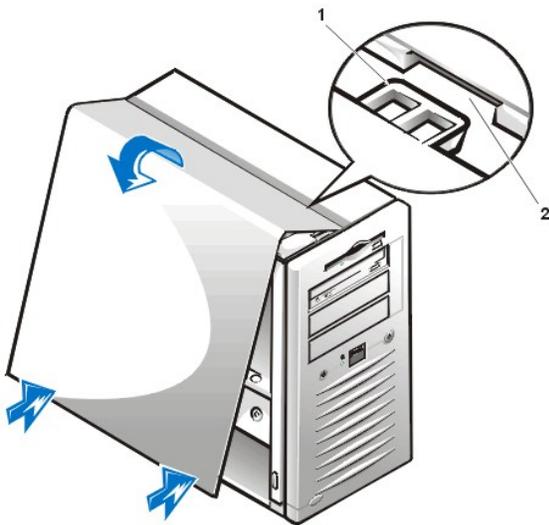
Figure 2. Computer Cover Removal



1 Release button

5. Lift the bottom of the cover, allowing it to pivot up toward you.
6. Disengage the tabs that secure the cover to the top of the chassis, and lift the cover away.

Figure 3. Computer Cover Replacement



1 Tab
2 Recessed slot

To replace the computer cover, perform the following steps:

1. Check all cable connections, especially those that might have come loose during your work.
Fold cables out of the way so that they do not catch on the computer cover. Make sure cables are not routed over the drive bracket—they will prevent the cover from closing properly.
2. Check to see that no tools or extra parts (including screws) are left inside the computer chassis.
3. Face the left side of the computer and hold the cover at a slight angle as shown in [Figure 3](#).
4. While aligning the top of the cover with the top of the chassis, insert the tabs on the cover into the recessed slots on the computer chassis.
5. Pivot the cover down toward the bottom of the chassis and into position.

With both hands, press against the bottom edge of the cover to make sure that the securing hooks at the bottom of the cover click into place.

- Slide the two halves of the padlock ring together to lock the cover release mechanism.

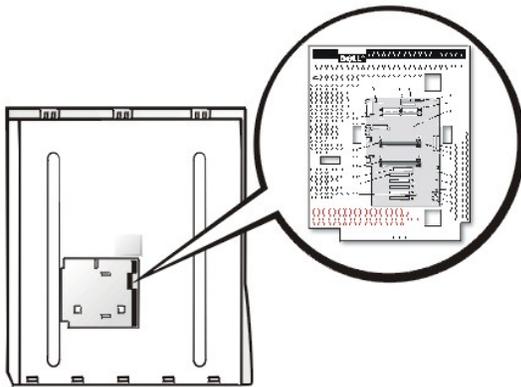
 **NOTE:** The computer should be placed fully on a flat surface. It is difficult to align the cover if the front of the computer is hanging over the edge of a table.

- If you are using a padlock to secure your system, reinstall the padlock.

Interior Service Label

Figure 4 shows the location of the interior service label on the inside of the system cover.

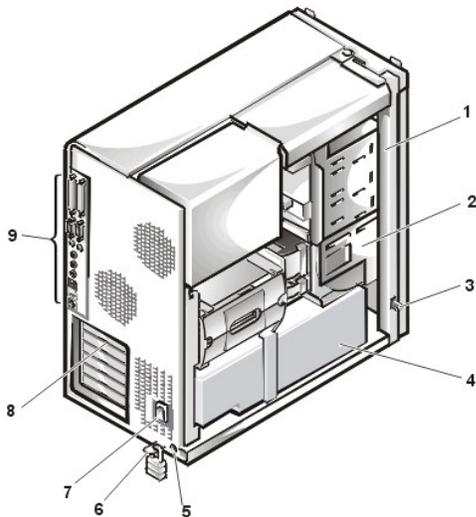
Figure 4. Interior Service Label



Internal View

Figure 5 shows the chassis with the cover removed to help you orient yourself when you work inside the computer.

Figure 5. Orientation View



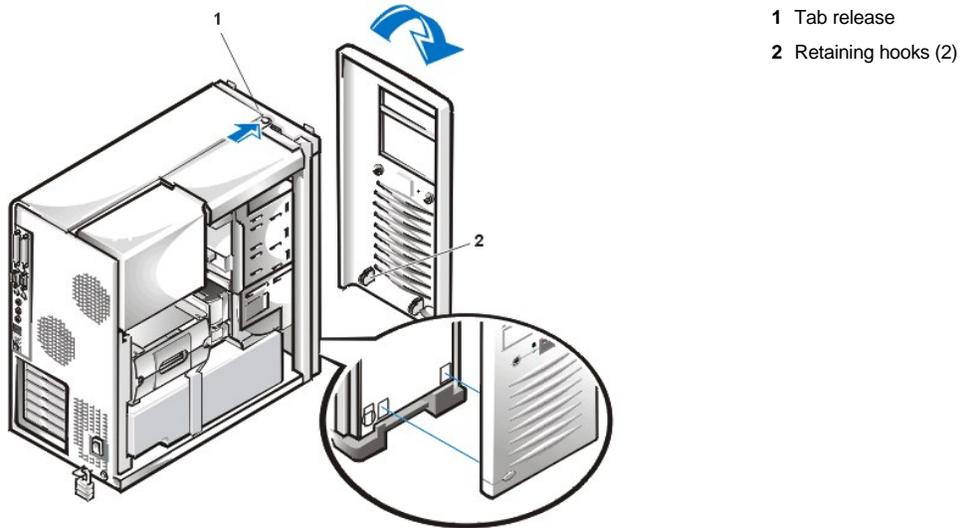
- Externally accessible drive bays
- Hard-disk drive cage
- Chassis intrusion switch
- Power supply
- Security cable slot
- Padlock ring (with padlock)
- AC power receptacle
- Expansion-card slots
- I/O panel connectors

Front Panel

To access some drive bays in the chassis, you must first remove the front panel.

To remove the front panel, you first must remove the computer cover (see "[Computer Cover](#)"). With the cover removed, release the panel by pressing the green tab release marked with the icon (see [Figure 6](#)).

Figure 6. Front Panel Removal



To remove the front panel, perform the following steps:

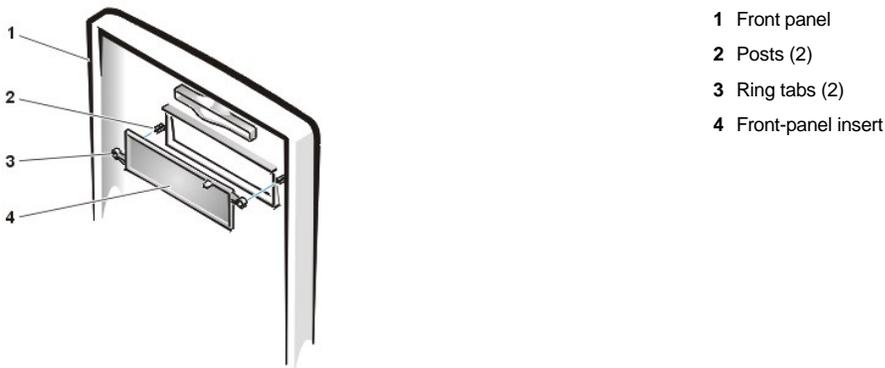
1. While pressing the tab release marked with the icon, tilt the panel away from the chassis.
2. Disengage the two retaining hooks at the bottom of the panel.
3. Carefully pull the panel away from the chassis.

To replace the front panel, perform the following steps:

1. Fit the two retaining hooks on the panel into their corresponding slots at the bottom of the chassis (see [Figure 6](#)).
2. Rotate the top of the panel toward the chassis until the tabs on the top of the chassis snap into their corresponding slots on the panel.

Front-Panel Inserts

Figure 7. Front-Panel Insert Removal



To remove a 5.25-inch front-panel insert, perform the following steps:

1. Hold the front panel with the front facing you.
2. From the front of the front panel, use your thumbs to press inward on the insert until it snaps clear of the cover.

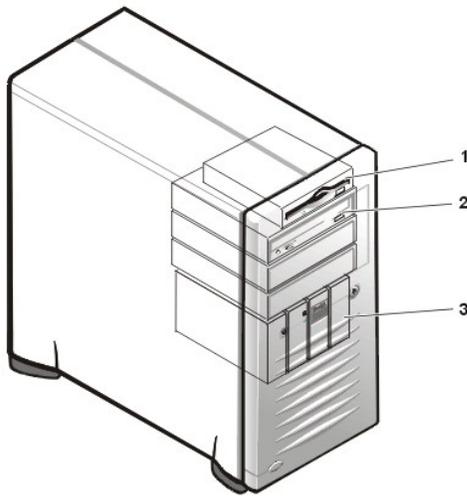
To replace a 5.25-inch front-panel insert, position the two ring-tabs over the posts on the inside of the bay opening, and then press the ring tabs over the posts.

Drives

 **CAUTION:** Before you remove the computer cover, see "[Precautionary Measures](#)."

 **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 8. Drive Locations



- 1 3.5-inch diskette drive
- 2 5.25-inch drive bays (3)
- 3 Hard-disk drive

3.5-Inch Diskette Drive Removal

To remove the 3.5-inch diskette drive assembly, perform the following steps:

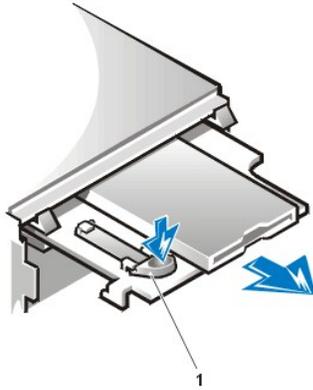
1. Disconnect the DC power/interface cables from the back of the diskette drive.

Remember the routing of the DC power/interface cables through the chassis as you disconnect them. It is important to route the cables properly when you replace them to prevent the cables from being pinched or crimped.
2. Press the retaining-tab release button (see [Figure 9](#)) and pull the diskette drive assembly forward to remove it from the chassis.
3. Remove the screw securing the diskette drive to the bracket (see [Figure 10](#)).
4. Rotate the left side of the diskette drive up until the drive is clear of the retaining tabs.

When you replace the 3.5-inch diskette drive on the bracket, be sure that the two retaining tabs on the right side of the bracket engage the mounting holes in the side of the 3.5-inch diskette drive/bracket. Replace the screw that holds the diskette drive to the bracket.

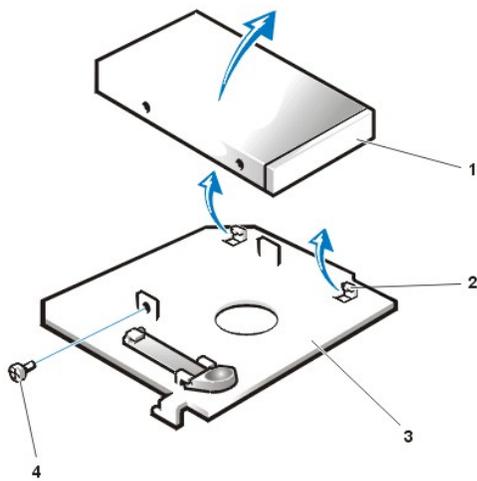
To replace the 3.5-inch diskette drive assembly in the chassis, slide the bracket tabs into the guides on the chassis until the bracket snaps into place. Reconnect the DC power/interface cables.

Figure 9. 3.5-Inch Drive Removal



1 Retaining-tab release button

Figure 10. 3.5-Inch Drive Bracket



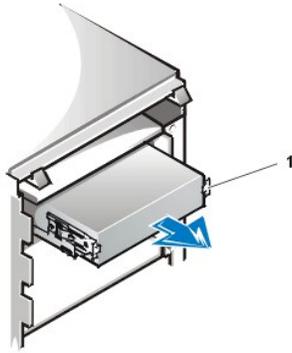
1 3.5-inch diskette drive
 2 Retaining tabs (2)
 3 Bracket
 4 Screw

5.25-Inch Diskette, Tape, or CD-ROM Drive Removal

To remove a diskette, tape, or CD-ROM drive, perform the following steps:

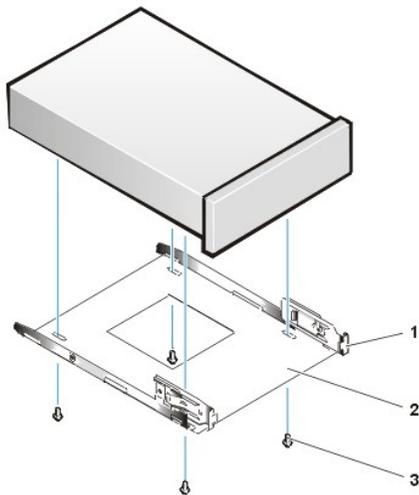
1. Disconnect the DC power cable and interface cable from the back of the drive.
2. If required, disconnect the audio cable from the back of the CD-ROM drive.
3. Squeeze the metal tabs that extend from each side of the drive bracket toward each other.
4. Pull the bracket out of the bay (see [Figure 11](#)).
5. Turn the drive/bracket assembly upside down and unscrew the four screws that secure the drive to the bracket (see [Figure 12](#)).

Figure 11. 5.25-Inch Drive Removal



1 Bracket tabs (2)

Figure 12. 5.25-Inch Drive Bracket



1 Metal tab
2 Drive bracket
3 Screws (4)

Installing a 5.25-Inch Diskette, Tape, or CD-ROM Drive

To install a 5.25-inch diskette, tape, or CD-ROM drive, perform the following steps.

CAUTION: Before you remove the computer cover, see "[Precautionary Measures.](#)"

1. Unpack the drive and prepare it for installation.

NOTICE: Ground yourself by either wearing a wrist grounding strap or by touching an unpainted metal surface on the computer chassis.

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.

2. If you are installing an enhanced integrated drive electronics (EIDE) drive, configure the drive for the **Cable Select** setting as described in the documentation that accompanied your drive.
3. [Remove the computer cover.](#)
4. [Remove the front panel.](#)
5. Remove the 5.25-inch drive bracket from the bay as instructed in "[5.25-Inch Diskette, Tape, or CD-ROM Drive Removal.](#)"
6. Attach the new drive to the drive bracket.

Turn the drive upside down, 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

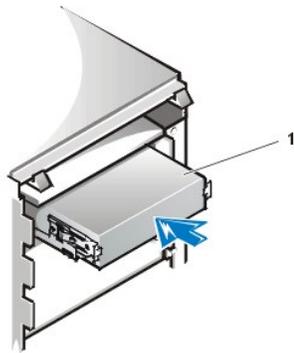
of the bracket should be flush with the front of the drive (see [Figure 13](#)).

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" on the bracket bottom).

- Slide the new drive into the drive bay until the drive snaps securely into place (see [Figure 13](#)).

Make sure that both bracket tabs snap into place in the drive bay.

Figure 13. 5.25-Inch Drive Replacement



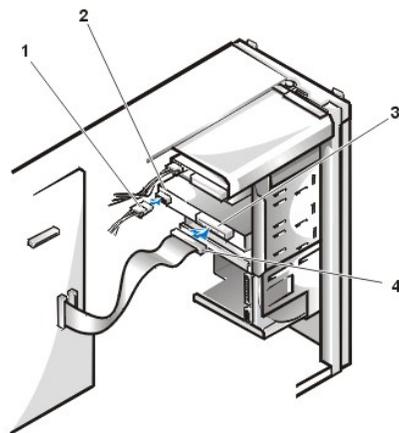
1 Drive

- Connect a DC power cable to the power input connector on the back of the drive (see [Figure 14](#)).
- Connect the appropriate interface cable to the interface connector on the back of the drive (see [Figure 14](#)).

If your system came with an EIDE CD-ROM or tape drive, use the spare connector on the existing interface cable. Otherwise, use the EIDE interface cable provided in the drive kit.

NOTICE: If you are installing an EIDE drive, 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.

Figure 14. Attaching Cables to 5.25-Inch Diskette Drives



- 1 DC power cable
- 2 Power input connector
- 3 Interface connector
- 4 Interface cable

- For an EIDE tape drive or CD-ROM drive, connect the other end of the interface cable to the interface connector labeled "IDE2" on the system board.

For a diskette drive, connect the cable from the drive to the interface connector labeled "DISKETTE" on the system board.

For a CD-ROM drive, reconnect the audio cable.

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

- If the 5.25-inch drive bay was previously empty, [remove the front-panel insert](#) from the front panel.

12. [Replace the front panel.](#)
13. [Replace the computer cover.](#) reconnect your computer and peripherals to their power sources, and turn them on.
14. Update your system configuration information in System Setup. For more information, see your online system *User's Guide*.
For a diskette drive, update **Diskette Drive A** or **Diskette Drive B** to reflect the size and capacity of your new diskette drive.
For EIDE CD-ROM and tape drives, set the appropriate **Secondary Drive 0** or **Secondary Drive 1** to **Auto**.
15. Verify that your system works correctly by running the Dell Diagnostics. For more information, see your online system *User's Guide*.

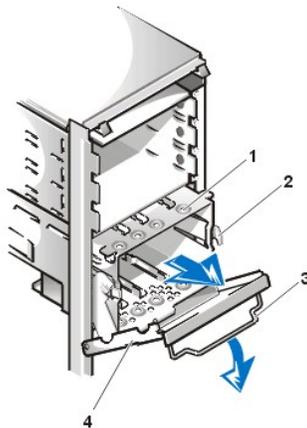
 **NOTE:** Tape drives sold by Dell come with their own operating software and documentation. After you install a tape drive, refer to the documentation that came with the drive for instructions on installing and using the tape drive software.

Hard-Disk Drive Removal

 **CAUTION:** Before you remove the computer cover, see "[Precautionary Measures.](#)"

1. [Remove the computer cover.](#)
2. Remove the front panel as instructed in "[Front Panel.](#)"
3. Disconnect the DC power cable and interface cable from the drive.
4. Pull the drive door forward and down until the hard-disk drive bracket is ejected halfway out of the chassis (see [Figure 15](#)).
5. Grasp the bracket and pull it completely out of the chassis.

Figure 15. Hard-Disk Drive Bracket Removal



- 1 Hard-disk drive bracket
- 2 Hinge tabs
- 3 Drive door handle
- 4 Drive door

Hard-Disk Drive Installation

To install a hard-disk drive, perform the following steps.

 **CAUTION:** Before you remove the computer cover, see "[Precautionary Measures.](#)"

 **NOTE:** If you are installing a replacement hard-disk drive for one containing data you want to keep, make a backup of your important files before starting this procedure.

1. Prepare the drive for installation.

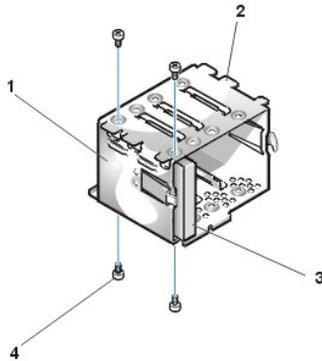
NOTICE: Ground yourself by either wearing a wrist grounding strap or by touching an unpainted metal surface on the computer chassis.

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.

Check the documentation for the drive to verify that it is configured for your computer system.

2. [Remove the computer cover.](#)
3. Remove the front panel as instructed in "[Front Panel.](#)"
4. Remove the drive bracket from the chassis as instructed in "[Hard-Disk Drive Removal.](#)"
5. Slide the drive into the chosen bay of the bracket, oriented so that the connectors on the back of the drive will face the back of the chassis when the bracket is reinstalled (see [Figure 16](#)).
6. Align the four screw holes of the drive and bracket. Insert and tighten the screws (see [Figure 16](#)).

Figure 16. Inserting a Hard-Disk Drive in the Bracket

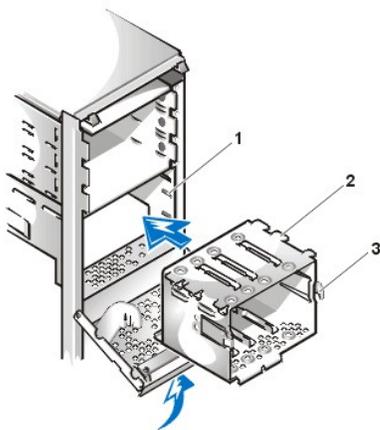


- 1 Drive bracket
- 2 Hooks (3)
- 3 1-inch drive (back)
- 4 Screws (4)

7. Reinstall the hard-disk drive bracket in the chassis (see [Figure 17](#)).

Insert the bracket into the chassis by sliding it in until the tabs snap into place. Rotate the drive door up and toward the chassis until it snaps securely into place. Be sure to fold down the drive door handle (see [Figure 17](#)) so that the front panel can be replaced on the chassis.

Figure 17. Inserting the Drive Bracket

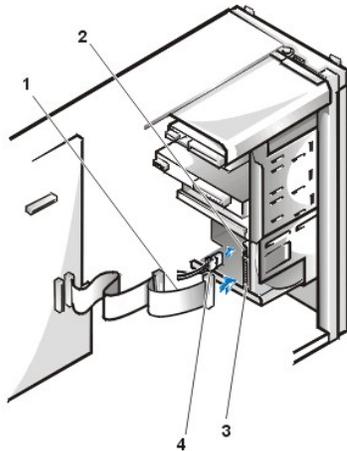


- 1 Drive cage
- 2 Drive bracket
- 3 Hinge tabs

8. Connect a DC power cable to the power input connector on the back of the drive (see [Figure 18](#)).
9. Connect the interface cable to the interface connector on the back of the hard-disk drive.

Check all connectors to be certain that they are properly cabled and firmly seated.

Figure 18. Attaching Hard-Disk Drive Cables



- 1 Interface cable
- 2 DC power input connector
- 3 Interface connector
- 4 DC power cable

10. If it is not already connected, connect the other end of the interface cable to the appropriate connector on the system board.
 11. Replace the computer cover and the front panel.
 12. Reconnect your computer and peripherals to their power sources, and turn them on.
 13. If the drive you just installed is the primary drive, insert a bootable diskette into diskette drive A.
 14. Partition and logically format your drive before proceeding to the next step.
See the documentation for your operating system for instructions.
 15. Test the hard-disk drive by running the Dell Diagnostics.
For more information, see your online system *User's Guide*.
 16. If the drive you just installed is the primary drive, install your operating system on the hard-disk drive.
Refer to the documentation that came with your operating system.
-

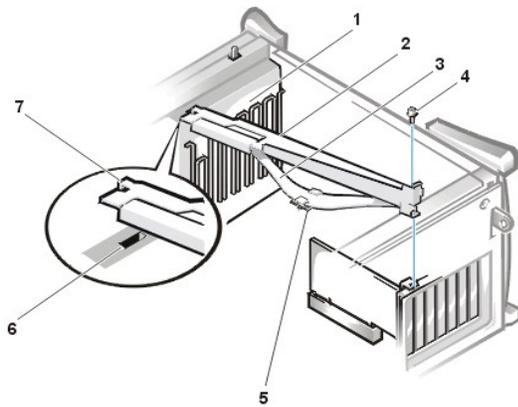
AGP Pro Card Brace

To access any expansion cards and components on the system board, you must first remove the accelerated graphics port (AGP) Pro card brace that secures an AGP Pro card in the AGP socket.

 **CAUTION:** Before you remove the computer cover, see "[Precautionary Measures](#)."

1. [Remove the computer cover](#).
2. Remove the screw securing the AGP Pro card brace through the AGP Pro expansion card's mounting bracket to the back of the chassis (see [Figure 19](#)).

Figure 19. AGP Pro Card Brace Removal



- 1 Card guide (front of chassis)
- 2 AGP Pro card brace
- 3 Card brace spring
- 4 Screw
- 5 Plastic card guide
- 6 Slot
- 7 Tab on AGP Pro card brace

3. Slide the card brace forward until it disengages from the slot in the card guide, then rotate the brace up and lift it away from the chassis.

To replace the card brace, perform the following steps:

1. Insert the tab on the end of the card brace into the slot above the card guide at the front of the chassis (see [Figure 19](#)).
2. Lower the card brace, ensuring that the plastic card guide on the bottom of the card brace spring engages the AGP Pro card.
3. Slide the card brace toward the back of the system until the tab at the end engages the slot in the chassis.
4. Replace the screw that secures the AGP Pro card brace to the chassis (see [Figure 19](#)).

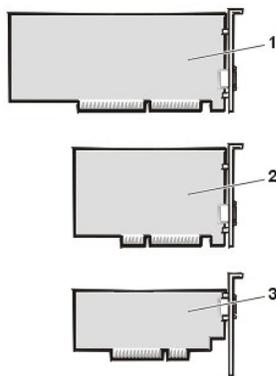
Expansion Cards

The system accommodates four 32-bit Peripheral Component Interconnect (PCI) expansion cards, two 64-bit PCI expansion cards, and one AGP Pro expansion card. (See [Figure 20](#)).



NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of this LED, see [Figure 28](#).

Figure 20. Expansion Cards



- 1 64-bit PCI expansion card
- 2 32-bit PCI expansion card
- 3 AGP Pro expansion card

Figure 21. AGP Pro Card Extension

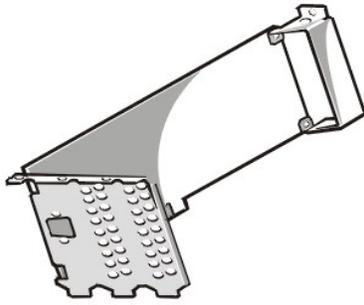


Figure 21 shows the AGP Pro card extension that occludes PCI slots 1 and 2.

Expansion-Card Removal

To remove an expansion card, perform the following steps.

⚠ CAUTION: Before you remove the computer cover, see "[Precautionary Measures.](#)"

1. [Remove the computer cover.](#)
2. [Remove the AGP Pro card brace.](#)
3. Disconnect any cables connected to the card.
4. Unscrew the mounting bracket screw of the card you want to remove.
5. Grasp the card by its outside corners, and ease it out of its connector.
6. If you are removing the card permanently, install a metal filler bracket over the empty card-slot opening.

 **NOTE:** Installing filler brackets over empty card-slot openings is necessary to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of your computer.

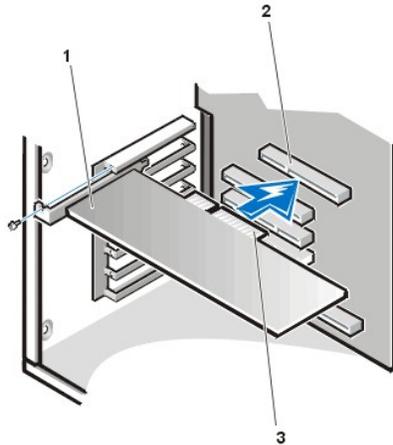
Expansion-Card Installation

To install a replacement expansion card, perform the following steps.

⚠ CAUTION: Before you remove the computer cover, see "[Precautionary Measures.](#)"

1. Remove the [computer cover.](#)
2. [Rotate the power supply](#) away from the system board.
3. Prepare the card as necessary, using the instructions provided with the card.
4. Insert the expansion card into the expansion-card connector.
5. If the expansion card is full-length, insert the front end of the card into the corresponding card guide on the inside front of the chassis as you insert the card into its connector. Insert the card's edge connector firmly into the expansion-card slot. Gently press the card into the connector until it is fully seated (see [Figure 22](#)).

Figure 22. Installing an Expansion Card

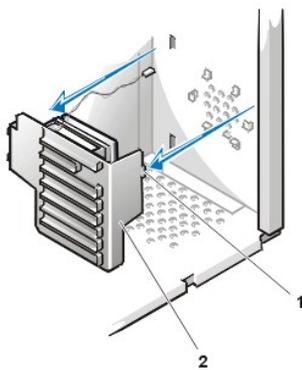


- 1 Expansion card
- 2 Expansion-card connector
- 3 Card edge connector

6. When the card is firmly seated in the connector, secure the card's mounting bracket to the chassis with the screw you removed in [step 4](#) of the removal procedure.
7. Connect any cables that should be attached to the card.

Expansion-Card Guide and Fan

Figure 23. Expansion-Card Guide Removal



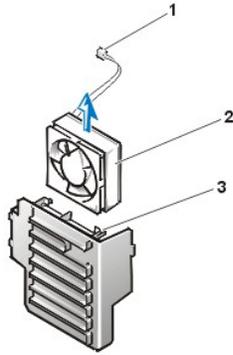
- 1 Tab
- 2 Expansion-card guide

To remove the expansion-card guide, perform the following steps.

⚠ CAUTION: Before you remove the computer cover, see "[Precautionary Measures](#)."

1. Remove the [computer cover](#).
2. [Rotate the power supply](#) away from the system board.
3. [Remove the AGP Pro card brace](#).
4. Remove all full-length [expansion cards](#).
5. Press down on the top of the card guide to release the tab from its slot, located on the lower-left area on the front of the chassis (see [Figure 23](#)).
6. Rotate the top of the card guide away from the chassis front.
7. Disconnect the fan power cable from its connector on the system board.
8. Lift the expansion-card guide and its attached fan out of the chassis.

Figure 24. Expansion-Card Guide Fan Removal



- 1 Fan power cable
- 2 Fan
- 3 Plastic locking tabs (2)

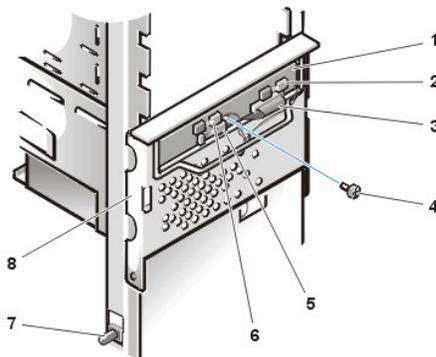
To remove the expansion-card guide cooling fan, perform the following steps.

⚠ CAUTION: Before you remove the computer cover, see "[Precautionary Measures.](#)"

1. Remove the computer cover according to the instructions in "[Computer Cover.](#)"
2. [Rotate the power supply](#) away from the system board.
3. Remove the [expansion-card guide and fan.](#)
4. Squeeze the tabs on the end of the fan bracket and slide the fan out of the expansion-card guide ([see Figure 24.](#))

Control Panel

Figure 25. Control Panel Removal



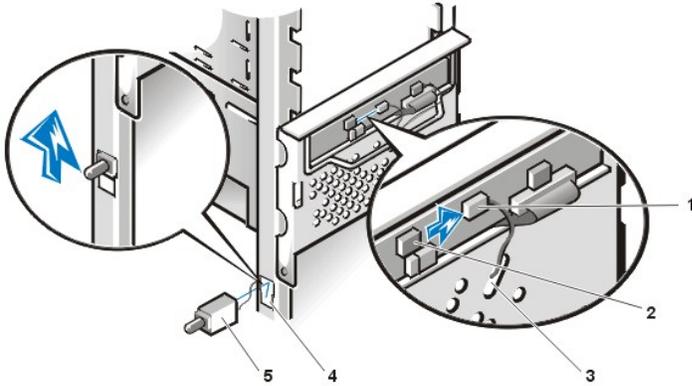
- 1 Control panel
- 2 Thermal cable connector
- 3 Control panel cable
- 4 Screw
- 5 Speaker cable connector
- 6 Chassis intrusion switch cable connector
- 7 Chassis intrusion switch
- 8 Hard-disk drive cage door

To remove the control panel, perform the following steps:

1. Disconnect the control panel cable from the PANEL connector on the system board (see [Figure 28](#) for the location of the PANEL connector).
2. Remove the mounting screw that secures the control panel to the hard-disk drive cage door.
3. Disconnect the chassis intrusion switch cable connector from the control panel.
4. Disconnect the thermal cable connector from the control panel.
5. Disconnect the speaker cable connector from the control panel.
6. Remove the control panel from the chassis.

Chassis Intrusion Switch

Figure 26. Chassis Intrusion Switch Removal



- 1 Chassis intrusion cable connector
- 2 Control panel chassis intrusion connector
- 3 Enlarged hole for cable
- 4 Switch slot
- 5 Chassis intrusion switch

⚠ CAUTION: Before you remove the computer cover, see "[Precautionary Measures.](#)"

To remove the chassis intrusion switch and install a replacement, perform the following steps:

1. Disconnect the chassis intrusion switch cable from the control panel (see [Figure 25](#)).

Note the routing of the chassis intrusion cable as you remove the cable from the chassis. The cable is routed through an enlarged hole in the chassis and through a hole in the disk-drive cage door. The chassis intrusion switch is mounted on the left front of the chassis (see [Figure 26](#)).

2. Slide the chassis intrusion switch out of its slot on the chassis and carefully remove the switch and its attached cable from the chassis.
3. Install the replacement chassis intrusion switch and cable.
4. 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.

5. To reset the chassis intrusion detector, enter System Setup, select **System Security**, and reset **Chassis Intrusion** to **Enabled**, **Enabled-Silent**, or **Disabled**.

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

Power Supply

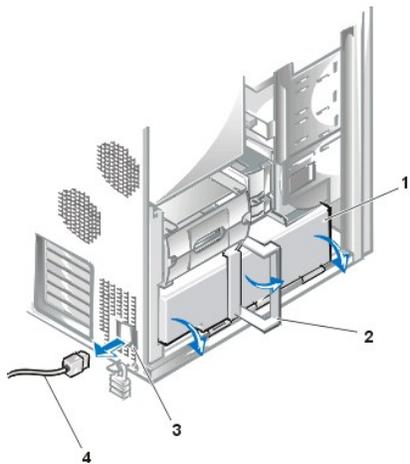
To access some components on the system board, you may have to rotate the system power supply out of the way. Use this procedure to rotate the supply out of the chassis, or to completely remove it.

To rotate or remove the power supply, perform the following steps.

⚠ CAUTION: Before you remove the computer cover, see "[Precautionary Measures.](#)"

1. [Remove the computer cover.](#)
2. To aid in the removal of the power supply, lay the computer on its side.
3. Disconnect the AC power cable from the AC power receptacle on the back of the power supply (see [Figure 27](#)).

Figure 27. Removing the Power Supply



- 1 Power supply
- 2 Release latch
- 3 AC power receptacle
- 4 AC power cable

4. Open the release latch and slide the power supply about 25 mm (1 inch) toward the front of the system.
5. Detach the power supply by rotating the power supply handle outward and down.

 **NOTE:** Perform the next step only if you are completely removing the power supply from the chassis.

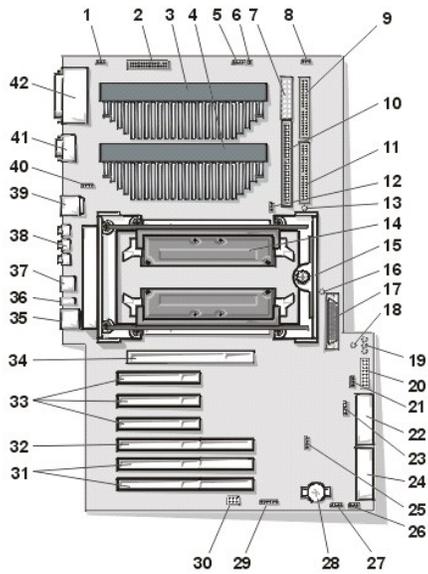
6. To completely remove the power supply from the chassis:
 - a. [Remove the AGP Pro card brace.](#)
 - b. [Remove all full-length expansion cards.](#)
 - c. [Remove the AGP Pro expansion-card guide.](#)
 - d. Disconnect the DC cables connected to the drives and to the system board.
 - e. Using a flat-tipped screwdriver, pry out the power-supply hinge pin from the chassis foot.
 - f. While supporting the weight of the power supply, pull the power-supply hinge pin completely out to release the power supply from the chassis.

When installing a replacement power supply, remember to rotate and secure the "L" end of the hinge pin into the groove on the chassis foot after installing the hinge pin.

System Board Components

Figure 28 shows the system board and the location of all its sockets and connectors.

Figure 28. System Board Components



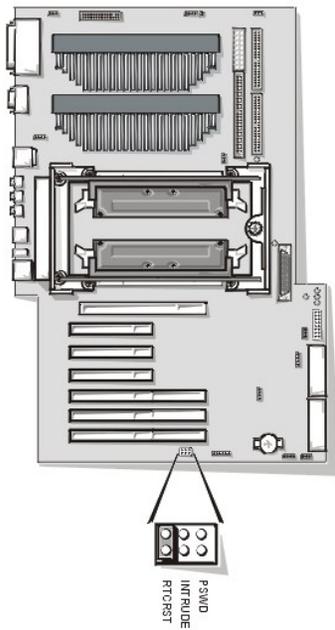
- 1 3-pin processor fan connector
- 2 34-pin diskette drive cable connector
- 3 Processor 0 (PROC_0) SECC connector
- 4 Processor 1 (PROC_1) SECC or terminator card connector
- 5 4-pin CD-ROM drive audio connector
- 6 Reserved (DO NOT use)
- 7 16-pin bay power connector
- 8 3-pin processor 1 heat sink fan connector (if present)
- 9 Secondary EIDE connector
- 10 50-pin narrow SCSI connector
- 11 Primary EIDE connector
- 12 3-pin processor 0 heat sink fan connector (if present)
- 13 Processor mismatch LED
- 14 RIMM and memory expansion card (MEC) B on MEC_B connector
- 15 Control panel connector
- 16 Suspend to RAM (STR) LED (sleep state)
- 17 68-pin SCSI Ultra/160 LVD connector
- 18 Memory missing or mismatched (MEC_MISMATCH) LED
- 19 Power LED/standby power LED/hard-disk drive activity LED
- 20 Panel connector
- 21 3-pin wakeup on LAN connector
- 22 20-pin MT power connector
- 23 4-pin auxiliary audio input connector
- 24 24-pin MT power connector
- 25 4-pin auxiliary drive access LED connector
- 26 Card cage fan connector
- 27 Telephony TAPI voice modem connector
- 28 Battery
- 29 CPLD_PROG connector
- 30 Jumper block (includes password, intruder, and RTCRST jumpers)
- 31 64-bit PCI expansion-card connectors (2)

- 32 32-bit PCI/RAID expansion-card connector
- 33 32-bit PCI expansion-card connectors (3)
- 34 AGP Pro connector
- 35 Network controller connector
- 36 Diagnostic LEDs
- 37 USB connectors (stacked)
- 38 Microphone, audio line-in, and audio line-out connectors
- 39 PS/2 keyboard and mouse connectors (stacked)
- 40 System fan connector
- 41 Serial port connectors (stacked)
- 42 Parallel port connector and SCSI port connectors (stacked)

System Board Jumpers

Figure 29 shows the location of the jumpers on the system board. [Table 1](#) lists the system board jumpers and their settings.

Figure 29. System Board Jumpers



Jumpers are small blocks on a circuit board with two or more pins emerging from them. Plastic plugs containing a wire fit down over the pins. The wire connects the pins and creates a circuit.

NOTICE: Make sure your system is turned off before you change a jumper setting. Otherwise, damage to your system or unpredictable results may occur.

To change a jumper setting, pull the plug off its pin(s) and carefully fit it down onto the pin(s) indicated.

Table 1. System Board Jumper Settings

Jumper	Setting	Description
PSWD	(default)	Password features are enabled.
		Password features are disabled.
INTRUDE	(default)	Chassis intrusion switch is enabled.
		Chassis intrusion switch is disabled.
RTCST		Real-time clock reset. Can be used for troubleshooting purposes.

System Board Labels

Table 2 lists the labels for connectors and sockets on your system board, and it gives a brief description of their functions.

Table 2. System Board Connectors and Sockets

Connector or Socket	Description
AGP	AGP video card connector
AUX	Aux-in audio card connector
AUX LED	Hard-disk drive access indicator connector
BATTERY	Battery socket
BAY_PWR	External bay devices power connector (CD-ROM drive, optional diskette drive, etc.)
CD-IN	CD-ROM drive audio interface connector
DISKETTE	Diskette drive interface connector
ENET	Network interface controller (NIC) connector
FAN	Microprocessor fan connector
FAN_CCAG	Card cage fan speed control connector
FAN_CPU	CPU fan connector
FAN_H1	Processor 1 heat sink fan
FAN_H2	Processor 2 heat sink fan
FAN_SYS	System fan
IDE _n	EIDE interface connector
KYBD/MOUSE	Keyboard connector and mouse connector (stacked)
LAN	Wakeup on LAN card connector
LINE-IN	Audio line-in jack
LINE-OUT	Audio line-out jack
MEC_A	MEC socket (channel A)
MEC_B	MEC socket (channel B)
MIC	Microphone jack
PANEL	Control panel connector
PARALLEL/SCSI	Parallel port connector (sometimes referred to as LPT1) and SCSI connector (stacked)
PCI1, PCI2, PCI3, PCI4	32-bit PCI expansion-card connectors
PCI5, PCI6	64-bit PCI expansion-card connectors
MT PWR1	Main power input connector 1
MT PWR2	Main power input connector 2
RAID	Optional RAID PCI expansion card connector extension
SCSI_NARROW	Secondary SCSI connector
SCSI_ULTRA2	Primary SCSI connector
SERIAL1/2	Serial port connectors (sometimes referred to as COM1 and COM2; stacked)
S2_PRI	Primary Intel® Pentium®: III Xeon™ microprocessor SECC connector
S2_SEC	Secondary Pentium III Xeon processor SECC connector
TAPI	TAPI input card connector (voice modem to audio system interface)
USB	USB connectors
WUOL	Wakeup on LAN connector

Memory

⚠ CAUTION: Before you remove the computer cover, see "[Precautionary Measures.](#)"

To remove a memory expansion card (MEC), perform the following steps.

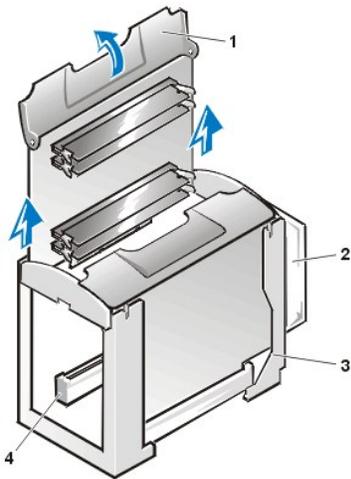
⚠ CAUTION: To avoid the possibility of electric shock, turn off the computer and any peripherals, disconnect them from their electrical outlets, and then wait at least 5 seconds before you remove the computer cover.

⚠ CAUTION: The memory modules can get extremely hot during system operation. To avoid dangerous burns, be sure that the modules have had sufficient time to cool before you touch them.

1. Remove the computer cover according to the instructions in "[Computer Cover.](#)"
2. Rotate the green memory expansion card cover up until it detaches the MEC from its socket (see [Figure 30](#)). Pull the MEC from the system.

If required, repeat this step for the other MEC.

Figure 30. MEC Removal

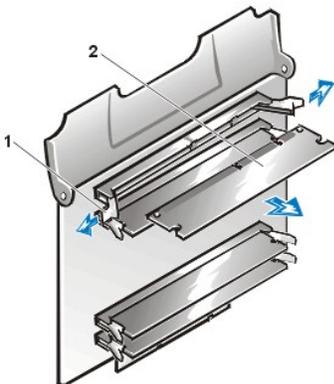


- 1 MEC cover
- 2 System fan
- 3 MEC guide bracket
- 4 MEC socket

3. Lay the MEC on a flat surface. Locate the plastic securing clips and press them outward simultaneously until they snap open and the memory module disengages and pops out slightly from the socket.

RIMMs

Figure 31. RIMM Removal



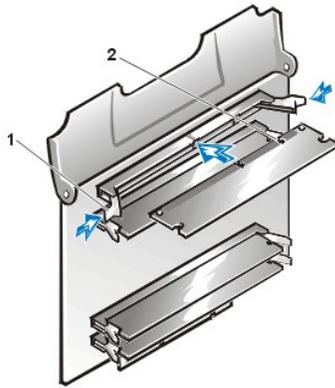
- 1 Securing clips (2)
- 2 RIMMs (4)

To reinstall memory, perform the following steps.

⚠ CAUTION: To avoid the possibility of electric shock, turn off the computer and any peripherals, disconnect them from their electrical outlets, and then wait at least 5 seconds before you remove the computer cover. Also, before you upgrade memory, see the other precautions in "[Precautionary Measures.](#)"

1. Locate the plastic securing clips at each end of the socket (see [Figure 32](#)).
2. Press the clips outward until they snap open.
3. Press the memory module straight into the slot running down the center of the socket until the securing tabs snap into place around the ends of the module.

Figure 32. RIMM Installation



- 1 Securing clips (2)
- 2 Notches (2)

4. Reinstall the MEC into the MEC guide bracket.

Push down until the MEC clicks into position. If required, repeat this step for the second MEC.

5. While securing or holding the end of the MEC guides, rotate the MEC cover down until a second click is heard; repeat this step for the second MEC.
6. Replace the computer cover, and reconnect your computer and peripherals to their electrical outlets 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.

The system detects that the new memory does not match the existing system configuration information and generates the following message:

The amount of system memory has changed. Strike the F1 key to continue, F2 to run the setup utility.

7. Press <F2> to enter System Setup, and check the value for **System Memory**.

The system should have already changed the value of **System Memory** to reflect the newly installed memory. Verify the new total. If it is correct, skip to [step 10](#).

8. If the memory total is incorrect, turn off and disconnect your computer and peripherals from their electrical outlets.

Remove the computer cover and check the installed memory modules to make sure that they are seated properly in their sockets. Then repeat [steps 1 through 7](#).

9. To reset the chassis intrusion detector, enter System Setup, select **System Security**, and reset **Chassis Intrusion** to **Enabled**, **Enabled-Silent**, or **Disabled**.

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

10. When the **System Memory** total is correct, press <Esc> to exit System Setup.
11. Run the Dell Diagnostics to verify that the new memory is operating properly.

Microprocessor/Heat Sink Assembly

 **NOTE:** Dell recommends that only a technically knowledgeable person perform this procedure.

CAUTION: Before you remove the computer cover, see "[Precautionary Measures.](#)"

NOTES: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power light-emitting diode (LED) on the system board has turned off. For the location of this LED, see [Figure 28](#).

Only the Microsoft® Windows NT® operating system versions 4.0 and higher supports dual microprocessors.

To take advantage of future options in speed and functionality, you can add a second microprocessor or replace either the primary or secondary processor.

NOTICE: The second processor must be the same type and speed as the first processor.

In systems with only one processor, a terminator card is installed in the secondary processor connector. The following sections describe how to install or replace a single-edge contact cartridge (SECC) package in either the primary or secondary processor connector.

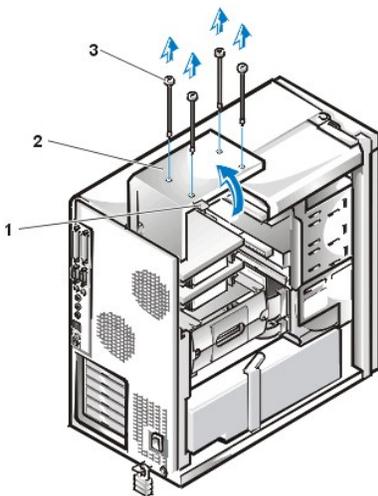
To remove or replace the SECC package and heat sink assembly, perform the following steps:

1. [Remove the computer cover.](#)

NOTE: To aid in the removal of the SECC package, lay the mini tower system on its side.

2. Remove the four thumbscrews that hold the processor cover and the SECC package to the system board.
3. Press the securing tab at the back of the chassis and rotate the processor cover out of the way, as shown in [Figure 33](#).

Figure 33. Rotating the Processor Cover



- 1 Securing tab
- 2 Processor cover
- 3 Thumbscrews (4)

CAUTION: The SECC package and heat sink assembly can get hot. To avoid burns, be sure the assembly has had sufficient time to cool before you touch it.

4. If you are adding a second processor to a single-processor system, remove the terminator card from the secondary SECC connector (labeled "PROC_1").

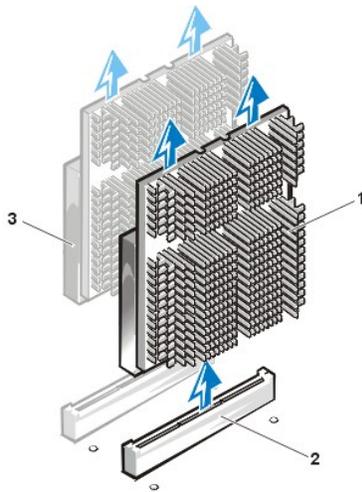
Pull the SECC terminator card straight out to remove it from the connector.

5. Detach and lift out the existing SECC package from its connector.

You must use up to 15 lb of force to disengage the SECC package from the connector. See [Figure 34](#).

6. Remove the heat sink fan connector, if present.

Figure 34. Microprocessor Removal



- 1 SECC microprocessor/heat sink assembly
- 2 SECC connector
- 3 Secondary processor

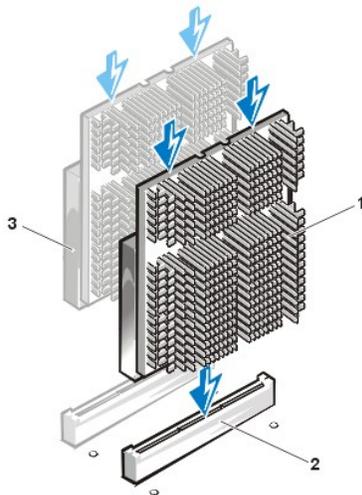
7. Insert the new microprocessor into the system board connector (see [Figure 35](#)).

Press the processor firmly into its connector until it is fully seated.

You must use up to 25 lb of force to fully seat the processor in its connector.

8. Reconnect the heat sink fan connector, if present.

Figure 35. Microprocessor Replacement



- 1 SECC microprocessor/heat sink assembly
- 2 SECC connector
- 3 Secondary processor

9. Rotate the processor cover back in place.

Push in on the panel of the processor cover at the uppermost rear corner to release the cover locking tab holding the processor cover in the up position. When the cover returns into the case, make sure that the securing tab snaps into place.

10. Replace and tighten the four thumbscrews that secure the processor cover and SECC package to the system board.

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

As the system boots, it detects the presence of the processors and automatically changes the system configuration information in System Setup.

 **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.

12. Enter System Setup, and confirm that the top line in the **System Data** area correctly identifies the type and number of installed processor(s).
13. While in System Setup, reset the chassis intrusion detector by changing **Chassis Intrusion** to **Enabled**, **Enabled-Silent**, or **Disabled**.

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

14. Run the Dell Diagnostics to verify that the new microprocessor is operating correctly.

 **NOTE:** For information on troubleshooting and running the Dell Diagnostics, see "Troubleshooting" in your system User's Guide to help solve problems that may occur.

15. Start the operating system and verify that it detects both processors.

If the Microsoft Windows NT 4.0 operating system does not detect the second processor, use the **uptomp.exe** utility (found in the optional Windows NT Resource kit) or reinstall the operating system.

 **NOTES:** For instructions on running the **uptomp.exe** utility, see your Windows NT Resource kit documentation.
For instructions on reinstalling Windows NT, see your Windows NT installation guide documentation.

Cooling Fan Removal

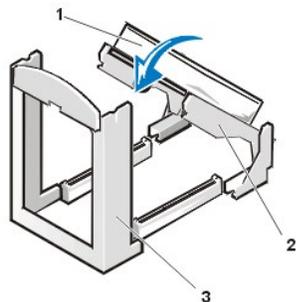
The system cooling fan is attached to the rear MEC guide bracket. To remove the system cooling fan, perform the following steps.

 **CAUTION:** Before you remove the computer cover, see "[Precautionary Measures](#)."

1. [Remove the computer cover](#).
2. [Remove the memory modules from the MEC guide bracket](#).
3. Remove the fan power cable from its connector (see [Figure 28](#) for the location of the system FAN connector).
4. Rotate the rear MEC guide bracket.

Push the top edge of the rear MEC guide bracket toward the front of the computer. Rotate the rear bracket down toward the system board (see [Figure 36](#)).

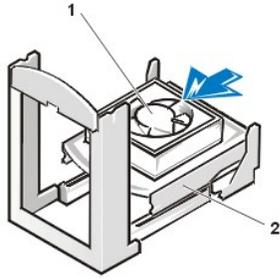
Figure 36. Rotate the MEC Guide Bracket



- 1 System cooling fan
- 2 Rear MEC guide bracket
- 3 Front MEC guide bracket

5. To release the bracket from the system board, grasp the sides of the guide bracket and pull it toward the front of the computer. Keep the guide bracket parallel to the system board (see [Figure 37](#)).

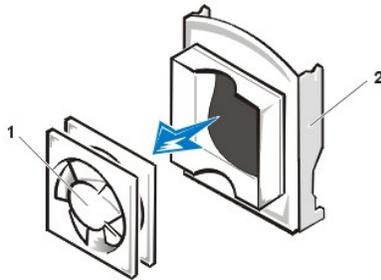
Figure 37. MEC Guide Bracket Release



- 1 System cooling fan
- 2 Rear MEC guide bracket

6. Holding the rear MEC bracket assembly, grasp the top and bottom of the fan (see Figure 38) and pull the fan loose from the bracket.

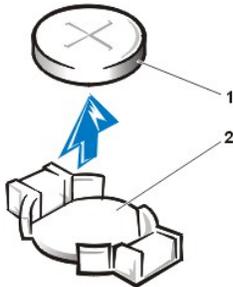
Figure 38. Cooling Fan Removal



- 1 System cooling fan
- 2 MEC guide bracket

Battery

Figure 39. Battery Removal



- 1 Battery
- 2 Socket

⚠ CAUTION: There is a danger of the new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

⚠ CAUTION: Before you remove the computer cover, see "[Precautionary Measures.](#)"

To remove the system battery, perform the following steps:

1. If possible, enter System Setup and print the System Setup screens.

If the settings are lost while you are replacing the battery, you can refer to your written or printed copy of the system configuration information to restore the correct settings.

2. To access the battery on the system board, [rotate the power supply](#) out of the way.

NOTICE: If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Make certain that the object is inserted between the battery and the socket before attempting to pry out the battery. Otherwise, you may damage the system board by prying off the socket or breaking circuit traces on the system board.

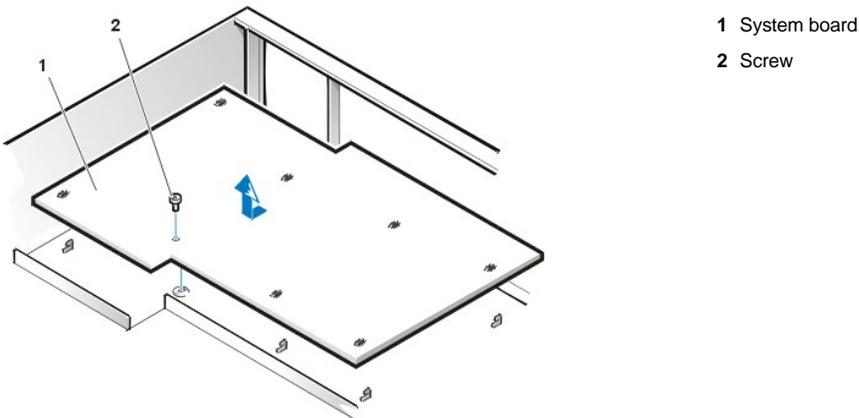
3. Locate and remove the system battery (see [Figure 28](#)) by carefully prying it out of its socket with your fingers or with a blunt, nonconducting

object such as a plastic screwdriver.

When you replace the system battery, orient the new battery with the "+" facing up. Insert the battery into its socket and snap it into place.

System Board

Figure 40. System Board Removal



CAUTION: Before you remove the computer cover, see "[Precautionary Measures](#)."

NOTE: Before disconnecting any peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of the standby power LED, see [Figure 28](#).

To remove the system board, perform the following steps:

1. [Remove the computer cover](#).
2. Disconnect all cables from their connectors at the back of the computer.
3. [Rotate the power supply](#) out of the way.
4. [Remove the MECs](#).
5. Remove the rear MEC bracket and system cooling fan.
6. [Rotate the processor cover](#) out of the way and [remove the microprocessor/heat sink assembly](#).
7. Disconnect all cables from the system board.
See [Figure 28](#) for the location of system connectors.
8. [Remove the AGP Pro card brace](#).
9. [Remove all expansion cards](#).
10. Remove the screw that secures the system board to the bottom of the chassis.
11. Slide the system board toward the front of the chassis until it stops.
12. Carefully lift the system board out of the chassis (be sure to lift evenly and not twist the system board).

To replace the system board, perform the following steps:

1. Carefully place the replacement system board in the chassis.
2. Push down near each slot to engage the grounding clip onto its corresponding tab.
3. Push evenly on both sides of the system board as you slide and lock it into position (do not twist the system board).
4. Reinstall the mounting screw.

5. Reinstall the rear MEC bracket and system cooling fan.
 6. Reinstall the MECs and the microprocessor/heat sink assembly.
 7. Reinstall all the expansion cards and AGP Pro card brace.
 8. Reconnect all the system board cables.
 9. Rotate the processor cover back into place, making sure that the securing tab snaps into place.
Replace all four thumbscrews that hold the processor cover and microprocessor/heat sink assembly to the system board.
 10. Replace the computer cover, connect all cables and peripherals, and turn them on.
 11. Run System Setup to ensure that your settings are correct and that all system board components are correctly reported.
 12. Run the Dell Diagnostics to verify that the new system board and components are operating correctly.
-

[Back to Contents Page](#)