

Dell™ PowerEdge™ 350 Systems Service Manual

[Safety Instructions](#)

[Preface](#)

[System Overview](#)

[Basic Troubleshooting](#)

[Messages and Codes](#)

[Removing and Replacing Parts](#)

[Jumpers](#)

[Using the System Setup Program](#)

Information in this document is subject to change without notice.

© 2001 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*, *PowerEdge*, and *PowerVault* are trademarks of Dell Computer Corporation; *Microsoft*, *MS-DOS*, *Windows*, and *Windows NT* are registered trademarks of Microsoft Corporation; *Intel* and *Celeron* are registered trademarks of Intel Corporation; *IBM* is a registered trademark of International Business Machines Corporation; and *Novell* and *NetWare* are registered trademarks of Novell, Inc.

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: 9 Feb 2001

Last revised: 31 May 2002

Safety Instructions: Dell™ PowerEdge™ 350 Systems Service Manual

- [Overview](#)
- [Notes, Notices, Cautions, and Warnings](#)
- [Safety Caution and Warnings](#)
- [Additional Safety Precautions](#)
- [When Working Inside Your Computer](#)
- [Protecting Against Electrostatic Discharge](#)
- [Ergonomic Computing Habits](#)

Overview

Use the following safety guidelines to ensure your own personal safety and to help protect your server, storage system, or appliance from potential damage.

Notes, Notices, Cautions, and Warnings

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, cautions, and warnings, and they are used as follows:

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

 **WARNING:** A WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious bodily injury.

Safety Caution and Warnings

Observe the following caution and warnings while servicing this system:

CAUTION: There is a danger of a 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.

WARNING: The power supplies in your computer or storage system may produce high voltages and energy hazards, which can cause bodily harm. Only trained service technicians are authorized to remove the computer covers and access any of the components inside the computer. This warning applies to Dell PowerEdge™ 4xxx or higher servers, Dell PowerVault™ storage systems, and Dell PowerApp appliances.



Additional Safety Precautions

To reduce the risk of bodily injury, electrical shock, fire, and damage to the equipment, observe the following precautions.

General Precautions

Observe the following general precautions for using and working with your system:

- Observe and follow service markings. Do not service any Dell product except as explained in your Dell system documentation. Opening or removing covers that are marked with the triangular symbol with a lightning bolt may expose you to electrical shock. Components inside these compartments should be serviced only by a Dell authorized service technician.
- If any of the following conditions occur, unplug the product from the electrical outlet and replace the part or contact your Dell authorized service provider:
 - The system cable, extension cable, or plug is damaged.
 - An object has fallen into the product.
 - The product has been exposed to water.
 - The product has been dropped or damaged.
 - The product does not operate correctly when you follow the operating instructions.
- Keep your system components away from radiators and heat sources. Also, do not block cooling vents.
- Do not spill food or liquids on your system components, and never operate the product in a wet environment. If the computer gets wet, see the appropriate chapter in your troubleshooting guide or contact a Dell-authorized service provider.
- Do not push any objects into the openings of your system components. Doing so can cause fire or electric shock by shorting out interior components.
- Use the product only with Dell products or other Dell-approved equipment.
- Allow the product to cool before removing covers or touching internal components.

- Use the correct external power source. Operate the product only from the type of power source indicated on the electrical ratings label. If you are not sure of the type of power source required, consult your Dell service provider or local power company.
- To help avoid damaging your system components, be sure the voltage selection switch (if provided) on the power supply is set to match the power available at your location:
 - 115 volts (V)/60 hertz (Hz) in most of North and South America and some Far Eastern countries such as South Korea and Taiwan
 - 100 V/50 Hz in eastern Japan and 100 V/60 Hz in western Japan
 - 230 V/50 Hz in most of Europe, the Middle East, and the Far East

Also be sure that your monitor and attached devices are electrically rated to operate with the power available in your location.

- Use only approved power cable(s). If you have not been provided with a power cable for your server, storage system, or appliance, or for any AC-powered option intended for your system, purchase a power cable that is approved for use in your country. The power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product.
- To help prevent electric shock, plug the system/components and peripheral power cables into properly grounded electrical outlets. These cables are equipped with three-prong plugs to help ensure proper grounding. Do not use adapter plugs or remove the grounding prong from a cable. If you must use an extension cable, use a three-wire cable with properly grounded plugs.
- Observe extension cable and power strip ratings. Make sure that the total ampere rating of all products plugged into the extension cable or power strip does not exceed 80 percent of the extension cable or power strip ampere ratings limit.
- To help protect your system/components from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- Position system cables and power cables carefully; route system cables and the power cable and plug so that they cannot be stepped on or tripped over. Be sure that nothing rests on your system components' cables or power cable.
- Do not modify power cables or plugs. Consult a licensed electrician or your power company for site modifications. Always follow your local/national wiring rules.
- To help avoid possible damage to the system board, wait 5 seconds after turning off the system before removing a component from the system board or disconnecting a peripheral device from the computer.
- Handle batteries carefully. Do not disassemble, crush, puncture, short external contacts, dispose of in fire or water, or expose batteries to temperatures higher than 60 degrees Celsius (140 degrees Fahrenheit). Do not attempt to open or service batteries; replace batteries only with batteries designated for the product.
- Turn down the volume before using headphones or other audio devices.

Precautions for Servers, Storage Systems, and Appliances

Follow the additional safety guidelines for your system:

- Unless your installation and/or troubleshooting documentation specifically allows it, do not remove enclosure covers, attempt to override the safety interlocks, or access any components inside the system. Depending on your system, installation and repairs may be done only by individuals who are qualified to service your computer or storage system equipment and trained to deal with products capable of producing hazardous energy levels.
- When connecting or disconnecting power to hot-pluggable power supplies, if offered with your Dell product, observe the following guidelines:
 - Install the power supply before connecting the power cable to the power supply.
 - Unplug the power cable before removing the power supply.
 - If the system has multiple sources of power, disconnect power from the system by unplugging *all* power cables from the power supplies.
- Move products with care; ensure that all casters and/or stabilizers are firmly connected to the computer or storage system. Avoid sudden stops and uneven surfaces.

Precautions for Rack-Mountable Products

Observe the following precautions for rack stability and safety. Also refer to the rack installation documentation accompanying the system and the rack for specific warning and/or caution statements and procedures.

Servers, storage systems, and appliances are considered to be components in a rack. Thus, "component" refers to any server, storage system, or appliance, as well as to various peripherals or supporting hardware.

 **WARNING: Installing Dell system components in a Dell rack without the front and side stabilizers installed could cause the rack to tip over, potentially resulting in bodily injury under certain circumstances. Therefore, always install the stabilizers before installing components in the rack.**

After installing system/components in a rack, never pull more than one component out of the rack on its slide assemblies at one time. The weight of more than one extended component could cause the rack to tip over and injure someone.

 **NOTE:** *Dell's servers, storage systems, and appliances are certified as components for use in Dell's rack cabinet using the Dell customer rack kit. The final installation of Dell systems and rack kits in any other brand of rack cabinet has not been approved by any safety agencies. It is the customer's responsibility to have the final combination of Dell systems and rack kits for use in other brands of rack cabinets evaluated for suitability by a certified safety agency.*

- System rack kits are intended to be installed in a Dell rack by trained service technicians. If you install

the kit in any other rack, be sure that the rack meets the specifications of a Dell rack.

- Do not move large racks by yourself. Due to the height and weight of the rack, Dell recommends a minimum of two people to accomplish this task.
- Before working on the rack, make sure that the stabilizers are secure to the rack, extend to the floor, and that the full weight of the rack rests on the floor. Install front and side stabilizers on a single rack or front stabilizers for joined multiple racks before working on the rack.
- Always load the rack from the bottom up, and load the heaviest item in the rack first.
- Make sure that the rack is level and stable before extending a component from the rack.
- Use caution when pressing the component rail release latches and sliding a component into or out of a rack; the slide rails can pinch your fingers.
- After a component is inserted into the rack, carefully extend the rail into a locking position, and then slide the component into the rack.
- Do not overload the AC supply branch circuit that provides power to the rack. The total rack load should not exceed 80 percent of the branch circuit rating.
- Ensure that proper airflow is provided to components in the rack.
- Do not step on or stand on any system/component when servicing other systems/components in a rack.

Precautions for Products With Modems, Telecommunications, or Local Area Network Options

Observe the following guidelines when working with options:

- Do not connect or use a modem or telephone during a lightning storm. There may be a risk of electrical shock from lightning.
- Never connect or use a modem or telephone in a wet environment.
- Do not plug a modem or telephone cable into the network interface controller (NIC) receptacle.
- Disconnect the modem cable before opening a product enclosure, touching or installing internal components, or touching an uninsulated modem cable or jack.
- Do not use a telephone line to report a gas leak while you are in the vicinity of the leak.

Precautions for Products With Laser Devices

Observe the following precautions for laser devices:

- Do not open any panels, operate controls, make adjustments, or perform procedures on a laser device other than those specified in the product's documentation.
 - Only authorized service technicians should repair laser devices.
-

When Working Inside Your Computer

Before you remove the computer covers, perform the following steps in the sequence indicated.

 **CAUTION:** Some Dell systems can be serviced only by trained service technicians because of high voltages and energy hazards. Do not attempt to service the computer system yourself, except as explained in this guide and elsewhere in Dell documentation. Always follow installation and service instructions closely.

NOTICE: To help avoid possible damage to the system board, wait 5 seconds after turning off the system before removing a component from the system board or disconnecting a peripheral device from the computer.

1. Turn off your computer and any devices.
2. Ground yourself by touching an unpainted metal surface on the chassis, such as the metal around the card-slot openings at the back of the computer, before touching anything inside your computer.

While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might harm internal components.

3. Disconnect your computer and devices from their power sources. Also, disconnect any telephone or telecommunication lines from the computer.

Doing so reduces the potential for personal injury or shock.

In addition, take note of these safety guidelines when appropriate:

- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, make sure that both connectors are correctly oriented and aligned.
- Handle components and cards with care. Don't touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a microprocessor chip by its edges, not by its pins.

 **CAUTION:** There is a danger of a 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.

Protecting Against Electrostatic Discharge

Static electricity can harm delicate components inside your computer. To prevent static damage, discharge static electricity from your body before you touch any of your computer's electronic components, such as the microprocessor. You can do so by touching an unpainted metal surface on the computer chassis.

As you continue to work inside the computer, periodically touch an unpainted metal surface to remove any

static charge your body may have accumulated.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the antistatic packing material until you are ready to install the component in your computer. Just before unwrapping the antistatic packaging, be sure to discharge static electricity from your body.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads and workbench pads.

The following notice may appear throughout this document to remind you of these precautions:

NOTICE: See "Protecting Against Electrostatic Discharge."

Ergonomic Computing Habits

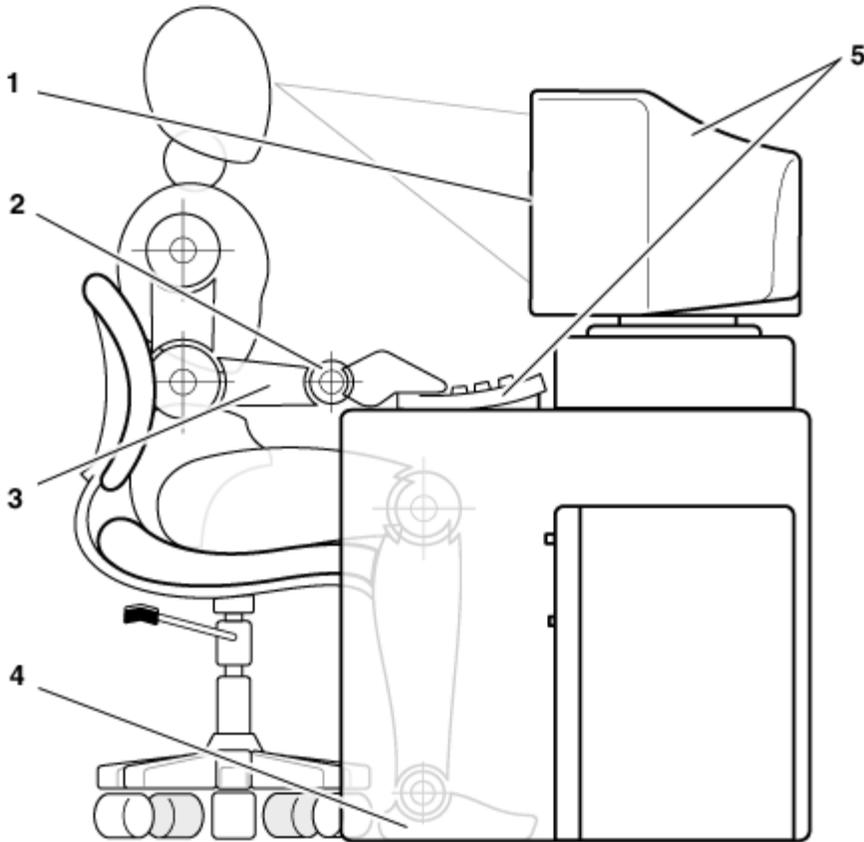
 **CAUTION: Improper or prolonged keyboard use may result in injury.**

 **CAUTION: Viewing the monitor screen for extended periods of time may result in eye strain.**

For comfort and efficiency, observe the following ergonomic guidelines when you set up and use your computer system:

- Position your system so that the monitor and keyboard are directly in front of you as you work. Special shelves are available (from Dell and other sources) to help you correctly position your keyboard.
- Set the monitor at a comfortable viewing distance (usually 510 to 610 millimeters [20 to 24 inches] from your eyes).
- Make sure that the monitor screen is at eye level or slightly lower when you sit in front of the monitor.
- Adjust the tilt of the monitor, its contrast and brightness settings, and the lighting around you (such as overhead lights, desk lamps, and the curtains or blinds on nearby windows) to minimize reflections and glare on the monitor screen.
- Use a chair that provides good lower back support.
- Keep your forearms horizontal with your wrists in a neutral, comfortable position while you use the keyboard or mouse.
- Always leave space to rest your hands while you use the keyboard or mouse.
- Let your upper arms hang naturally at your sides.
- Sit erect, with your feet resting on the floor and your thighs level.

- When sitting, make sure the weight of your legs is on your feet and not on the front of your chair seat. Adjust your chair's height or use a footrest, if necessary, to maintain proper posture.
- Vary your work activities. Try to organize your work so that you do not have to type for extended periods of time. When you stop typing, try to do things that use both hands.



- 1 Monitor screen at or below eye level
- 2 Wrists relaxed and flat
- 3 Arms at desk level
- 4 Feet flat on the floor
- 5 Monitor and keyboard positioned directly in front of user

Preface: Dell™ PowerEdge™ 350 Systems Service Manual

A prerequisite for using this manual to service Dell systems is a basic knowledge of IBM®-compatible personal computer systems and prior training in IBM-compatible personal computer system troubleshooting techniques. In addition to information provided in this manual and in the *User's Guide* that came with the system, Dell provides the *Installation and Troubleshooting Guide* for troubleshooting procedures and instructions on using Dell Diagnostics to test the system.

The sections are summarized as follows:

- "[Safety Instructions](#)" — Lists safety guidelines and precautions you should take to ensure your own safety and help protect your system from potential damage.
- "[System Overview](#)" — Provides an overview of the system's service features and technical specifications.
- "[Basic Troubleshooting](#)" — Lists initial checks and procedures used to solve basic system problems and information on more detailed service and troubleshooting procedures to solve more complex problems.
- "[Messages and Codes](#)" — Describes system error messages, warning messages, alert log messages, diagnostics messages, power-on self-test (POST) beep codes, and system codes.
- "[Removing and Replacing Parts](#)" — Describes the removal and replacement of all field-replaceable parts, including dual in-line memory modules (DIMMs), microprocessors, expansion cards, and integrated drive electronics (IDE) devices.
- "[Jumpers](#)" — Provides the jumper settings to change when servicing the system.
- "[Using the System Setup Program](#)" — Describes how to use the program to change the system configuration information stored in nonvolatile random-access memory (NVRAM) on the system board.

System Overview: Dell™ PowerEdge™ 350 Systems Service Manual

[Overview](#)

[System Features](#)

[Service Features](#)

[Technical Specifications](#)

Overview

The Dell PowerEdge 350 system uses an Intel® Celeron® or Pentium® III microprocessor and next-generation chip set and memory technology to provide high performance in Internet server and Web hosting application environments.

This section describes the hardware features that simplify servicing of the system. It also describes major hardware and software features of the system.



NOTE: The PowerEdge 350 system is a "headless" system that operates without keyboard, monitor, or mouse. While it is possible to connect these peripherals to the system, it is generally not necessary unless troubleshooting the system.

System Features

The system offers the following major features:

- One Celeron microprocessor with an internal operating frequency of at least 600 megahertz (MHz) or one Pentium III microprocessor with an internal operating frequency of 750 MHz.

A secondary level 2 (L2) cache of 128 kilobytes (KB) (Celeron) or 256 KB (Pentium III) SRAM is included within the microprocessor. Math coprocessor functions are provided by the microprocessor. A separate and external math coprocessor chip set is not used or required.

- Front-side bus with an external bus speed of 66 MHz (Celeron) or 100 MHz (Pentium III).
- A minimum of 128 megabytes (MB) of system memory, upgradable to a maximum of 1 GB by installing combinations of 128, or 256 MB unbuffered, registered synchronous dynamic random-access memory (SDRAM) (dual inline memory modules) DIMMs in the four DIMM sockets on the system board.
- A flash basic input/output system (BIOS) that can be upgraded if required.
- One or two 1-inch integrated drive enhanced (IDE) 10, 20, or 40 gigabyte (GB) hard-disk drives.
- Slimline 1.44 MB 3.5-inch diskette drive.
- Slimline CD-ROM drive.

The system board includes the following features:

- One full-length peripheral component interconnect (PCI) slot open.
- One low-profile PCI slot occupied by a video controller card.
- An integrated SSMC FDC37B807 input/output (I/O) controller that controls two serial ports, keyboard, mouse, and the diskette drive. The device also provides intelligent power management.
- Two integrated Intel 82559 PRO/100+ Ethernet controllers, which provide two Ethernet interfaces
- A Heceta 2 system monitor controller monitors the operation of the system fans as well as critical system voltages and temperatures. The Heceta 2 controller is routed through the SMBus interface. Threshold faults are available by polling the Heceta 2 via the SMBus interface.
- A Personal System/2 (PS/2)-style keyboard port, dual Universal Serial Bus (USB) ports, and a PS/2-compatible mouse port

The following software is included in the system:

- Video and IDE device drivers that allow the operating system to communicate with attached monitors and IDE devices.
- The [System Setup program](#) is provided for quickly viewing and changing the system configuration information.
- Enhanced security features, including a user password and a supervisor password, are available through the [System Setup program](#).

Service Features

The system includes a diagnostics CD, which checks for hardware problems (if the system can boot). The diagnostics utility makes troubleshooting and repair easy and effective, in most cases without tools or service aids. For information on using the system diagnostics, see "[Basic Troubleshooting](#)."

If you have hard-disk drive problems, use the information in "[Basic Troubleshooting](#)" to back up the hard-disk drives, and then reinstall the system software.

The system chassis simplifies removing and replacing components. You can replace the microprocessor or memory modules without removing the system board.

Technical Specifications

There are two optional processors. Your system has one processor.

Microprocessor

Microprocessor type	Intel Celeron microprocessor with an internal operating frequency of at least 600 MHz and an external operating frequency of 66 MHz
---------------------	---

Front side bus	66 MHz
Internal L2 cache	128 KB, internal to microprocessor
Math coprocessor	internal to microprocessor

or

Microprocessor

Microprocessor type	Intel Pentium III microprocessor with an internal operating frequency of at least 750 MHz and an external operating frequency of 100 MHz
Front side bus	100 MHz
Internal L2 cache	256 KB, internal to microprocessor
Math coprocessor	internal to microprocessor

Expansion Bus

Bus type	PCI bus
Expansion slots	one full-length PCI slot; one low-profile PCI slot (occupied by video controller)

Memory

DIMM sockets	four 72-bit wide, 168-pin sockets
DIMM capacities	128-, or 256-MB unbuffered and registered SDRAM DIMMs; must be rated for 100-MHz operation
Minimum RAM	128 MB
Maximum RAM	1 GB
External cache	none

Drives

Diskette drive	3.5-inch, 1.44 MB diskette drive included with standard system
Hard-disk drives	two 1-inch high ATA-100 IDE slots in hard-disk drive bay support formatted capacities from 10 GB to 20 GB and higher

CD-ROM drive	IDE
--------------	-----

External Ports and Connectors

Serial	two 9-pin connectors
Video	15-pin connector
PS/2-style keyboard	6-pin mini-DIN connector
PS/2-compatible mouse	6-pin mini-DIN connector
USB	two USB-compliant 4-pin connectors
Ethernet	two RJ45 connectors for connection to integrated Intel 82559 10/100 Ethernet controllers

Video

Video type	PCI video controller; VGA connector
Video memory	8-MB SDRAM standard (not upgradable)

Power

DC power supply:

Wattage	125 W
Heat dissipation	898 BTU/hr (maximum)
Input voltage	100 to 120 V at 50 Hz/200 to 240 V at 60 Hz autoranging, power factor corrected
Output voltages and maximum current	+5 VDC at 13 A +3.3 VDC at 6 A +12 VDC at 3 A -12 VDC at 0.2 A +5 Vfp (volts flea power) at 1 A
Max. inrush current	Under typical line conditions and over the entire system ambient operating range, the inrush may reach 140 A for the installed power supply.
Backup battery	3-V CR2032 lithium coin cell

Physical

Rack mount (1U):

Height	4.3 cm (1.7 inches)
Width	42.5 cm (16.7 inches)
Depth	55.8 cm (22 inches)
Weight	10 kg (23 lb) maximum configuration

Environmental

Temperature:

Operating	10°C to 35°C (50°F to 95°F) derated 0.5°C per 1000 ft
Non-operating	-40°C to 65°C (-40°F to 149°F)
Maximum gradient	10°C per hour maximum rate of change

Relative humidity:

Non-operating	5% to 95% (noncondensing) at 30°C
---------------	-----------------------------------

Maximum shock:

Operating	six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 41 G for up to 2 ms
Package	six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 71 G for 2 ms

Altitude:

Operating	-16 to 3048 m (-50 to 10,000 ft)
-----------	----------------------------------

High-potential ESD:

Electrostatic discharge	15kV
-------------------------	------

Noise (maximum):

Acoustic noise	< 45dbA @ 23°C ±2°C
----------------	---------------------

[Back to Contents Page](#)

Basic Troubleshooting: Dell™ PowerEdge™ 350 Systems Service Manual

- [Overview](#)
 - [Initial User Contact](#)
 - [External Visual Inspection](#)
 - [Observing the Boot Routine](#)
 - [Internal Visual Inspection](#)
 - [Running the Dell Diagnostics](#)
 - [Getting Help](#)
-

Overview

This section describes basic troubleshooting procedures that can help you diagnose a Dell PowerEdge 350 system problem. These procedures can often reveal the source of a problem or indicate the correct starting point for servicing the system. For a brief explanation of how to load and start the system diagnostics, see "Running the Dell Diagnostics" in the system *Installation and Troubleshooting Guide*. Dell recommends that you perform the following procedures in the order presented.

Initial User Contact



NOTE: The PowerEdge 350 system is a "headless" system that operates without keyboard, monitor, or mouse. While it is possible to connect these peripherals to the system, it is generally not necessary unless troubleshooting the system.

When you first contact a user who has a problem, ask the user to describe the problem and the conditions under which it occurs. After the user describes the problem, perform the following steps:

1. Ask the user to back up any data on the hard-disk drive if the system's condition permits.
2. Ask the user to try to duplicate the problem by repeating the operations he or she was performing at the time the problem occurred.

Can the user duplicate the problem?

Yes. Proceed to step 3.

No. Proceed to "[External Visual Inspection](#)."

3. Observe the user to determine if he or she is making an error, such as typing an incorrect key combination or entering a command incorrectly.

Is the problem a result of user error?

Yes. Instruct the user in the proper procedure or direct the user to the appropriate user documentation for the correct procedure.

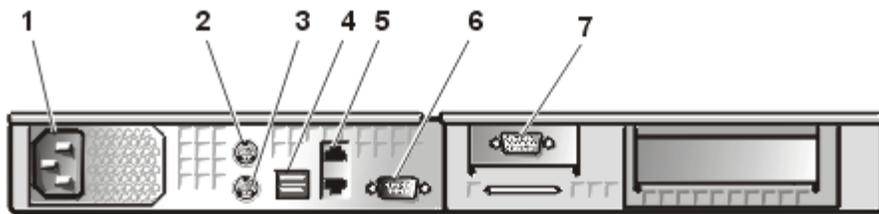
No. Proceed to "[External Visual Inspection.](#)"

External Visual Inspection

Improperly set switches and controls and loose or improperly connected cables are the most likely source of problems for the system, monitor, or other peripherals (such as a keyboard, mouse, or other external equipment). A quick check of all the switches, controls, and cable connections can easily solve these problems.

Figure 1 shows the back-panel connections on the system. [Figure 2](#) shows the front-panel controls and indicators on the system.

Figure 1. Back-Panel Features



- 1 AC power receptacle
- 2 Mouse connector
- 3 Keyboard connector
- 4 USB connectors (2)
- 5 NIC connectors (2)
- 6 Serial port 1
- 7 Video monitor

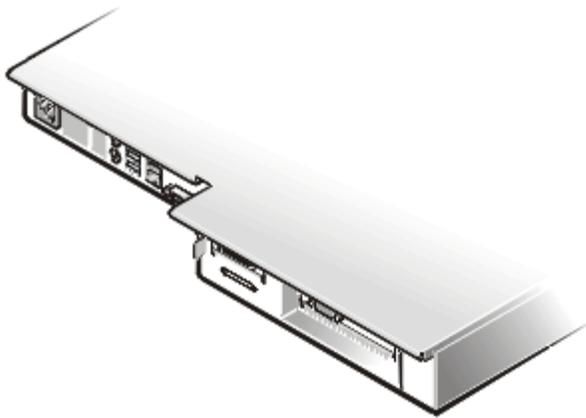
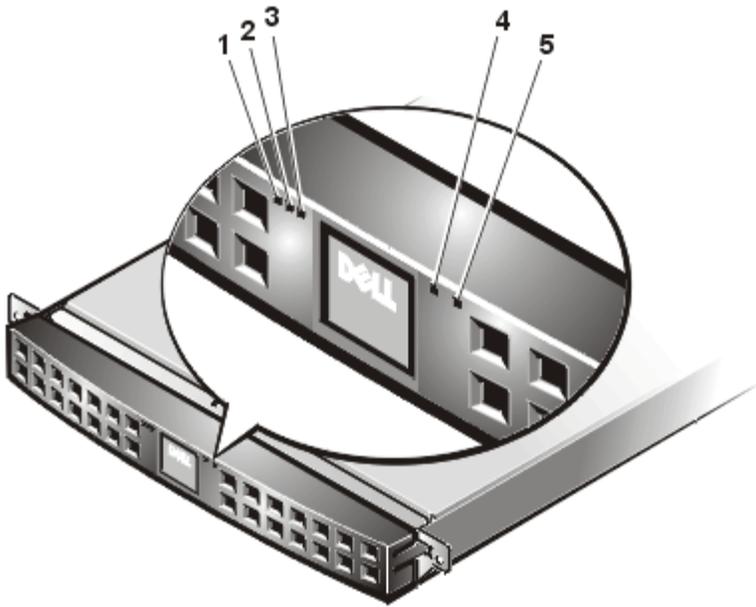


Figure 2. Front-Panel Features

- 1 Power indicator
- 2 System fault indicator
- 3 Hard-disk drive activity indicator
- 4 LAN 1 activity/link indicator
- 5 LAN 2 activity/link indicator



The external visual inspection consists of a quick inspection of the exterior of the system, the monitor, the keyboard, any peripherals, and cables. While performing the visual inspection, make any necessary corrections. To perform the external visual inspection, perform the following steps:

1. Turn off the system, the monitor, and all peripherals.
2. Verify that all power cables are properly connected to the system, the monitor and peripherals, and their power sources.
3. Verify that the keyboard and mouse interface cables are firmly attached to the proper connectors on the back of the system.

For a PS/2-compatible mouse, the keyboard and mouse interface cable connectors are identical except for their labels.

For a serial mouse, the mouse interface cable must be firmly attached to one of the serial port connectors, and its captive screws must be secure enough to ensure a firm connection.

4. Verify that network cables (if present) are properly attached.
5. Verify that any devices attached to the serial port connectors are properly connected.

Each of the serial port interface cables must be firmly attached to an appropriate connector on the back of the system as well as to the interface connector on the device. The captive screws that secure these connectors at each end of the interface cable must be secure enough to ensure a firm connection.

6. Verify that the video interface cable is firmly attached to the video connector on the back of the system or the video expansion card (if installed), and also to the connector on the back of the monitor. For proper connection of the video monitor, see the documentation for the monitor.
7. Inspect all external monitor controls for any obvious damage or improper settings. For proper settings of the video monitor controls, see the documentation for the monitor.

8. Inspect the keyboard to ensure that no keys are sticking. If one or more keys are sticking, it may be necessary to replace the keyboard.
9. Inspect the exterior of the system, including all controls and indicators, and all user-accessible data storage devices for any signs of physical damage.

Does the inspection reveal any problems?

Yes. Proceed to the appropriate procedure in "[Removing and Replacing Parts](#)."

No. Proceed to "[Observing the Boot Routine](#)."

Observing the Boot Routine

After you have performed an external visual inspection as described in "External Visual Inspection" boot the system and, while the boot routine is running, observe the system for any indications of problems.



NOTE: Most of the steps in this procedure require observation of system functions and indications, some of which can occur simultaneously. It may be necessary to reboot the system several times to complete all of these steps.

To perform the following procedure, you need the diagnostics CD provided with your PowerEdge software. If your CD is not available, you can download the diagnostics program to a diskette from the Dell Web site at <http://support.dell.com>.

To observe problem indications during the boot routine, perform the following steps:

1. If the system is off, turn on all peripherals and the system.
2. Insert the diagnostics CD into the CD-ROM drive (or the diskette containing the diagnostics program) and reboot the system.
3. Watch the <Num Lock>, <Caps Lock>, and <Scroll Lock> indicators on the upper-right corner of the keyboard.

After all three indicators flash momentarily, and following a long pause (approximately 30 seconds), the **Num Lock** indicator should light up and remain on (unless the **Num Lock** option is set to **Off** in the [System Setup program](#)).

Do these indicators flash on and off within approximately 10 seconds after the boot routine starts?

Yes. Proceed to step 3.

No. Replace the system power supply.

4. During the boot routine, observe the system for any of the following indications:
 - Post beep codes — A beep code is a series of beeps that indicates an error condition. See "[Post Beep Codes](#)."
 - System error messages — These messages can indicate problems or provide status information.

If a system error message appears, see "[System Messages](#)."

- Diskette-drive and hard-disk drive access indicators — These indicators light up in response to data being transferred to or from the drives. If either of these indicators fails to light up during the boot routine, troubleshoot the diskette drive or hard-disk drive subsystem, as appropriate.

5. Observe the monitor screen for the **Diagnostics** menu.

Does the **Diagnostics** menu appear?

Yes. See "[Running the Dell Diagnostics](#)."

No. Proceed to step 5.

6. Insert another copy of the diagnostics CD or diskette into the appropriate drive, and reboot the system.

Does the **Diagnostics** menu appear?

Yes. See "[Running the Dell Diagnostics](#)."

No. Proceed to "[Internal Visual Inspection](#)."

Internal Visual Inspection

NOTICE: Before you proceed with the internal visual inspection described in this section, ensure that the user has saved all open files and exited all open application programs, if possible.

A simple visual inspection of a system's interior hardware can often lead to the source of a problem, such as a loose expansion card, cable connector, or mounting screw. When you perform the visual inspection, see "[System Features](#)" to locate components referenced in the inspection procedure.

To perform the internal visual inspection, perform the following steps:

1. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from electrical outlets.

 **CAUTION:** Before beginning to work inside the system, disconnect the power supply from the power source and the power supply cables from the power supply.

2. Remove the system cover as described in "[System Cover](#)."

 **CAUTION:** The microprocessor and heat sink assembly can get extremely hot during system operations. Be sure that they have had sufficient time to cool before touching them.

 **CAUTION:** When handling the microprocessor and heat-sink assembly, take care to avoid sharp edges on the heat sink.

3. Verify that the chip sets, memory modules, expansion cards, and microprocessor and heat-sink assembly are fully seated in their sockets or connectors.
4. To ensure that the chip sets are fully seated in their sockets, press firmly on the top of each chip.
5. To remove and reseat a microprocessor and heat sink assembly, perform the steps described in "[Microprocessor](#)."
6. To remove and reseat a memory module, perform the steps described in "[DIMMs](#)."
7. If you need to remove and reseat an expansion card, remove the card as described in "[Expansion Cards](#)," and carefully reinsert the card in its connector until fully seated.
8. Verify that all jumpers are set correctly.

For information about jumper settings, see "[System Board Jumpers](#)."

9. Check all cable connectors inside the system to verify that they are firmly attached to their appropriate connectors.
10. [Replace the system cover](#).
11. Reconnect the system and any attached peripherals to their power sources, and turn them on.

Does the problem appear to be resolved?

Yes. No further steps are necessary.

No. Proceed to "[Getting Help](#)."

Running the Dell Diagnostics

 *NOTE: You must connect a keyboard and monitor to run the Dell Diagnostics.*

You must run the Dell Diagnostics from a set of diskettes that you create from the *Dell OpenManage Server Assistant* CD.

To run the Dell Diagnostics from the diskettes, perform the following steps:

Create a set of diagnostics diskettes using the *Dell OpenManage Server Assistant* CD.

To create diagnostic diskettes from the *Dell OpenManage Server Assistant* CD, select **Create Diskettes** from the **Dell OpenManage Server Assistant** menu and then continue down the menu hierarchy by selecting the following categories: **PowerEdge 350**, **Diskette Set**, **System Utilities**, **Server Diagnostics**. Create five Server Diagnostics diskettes.

Boot the system from the first diagnostics diskette.

If the system fails to boot, see "Getting Help," for instructions on obtaining technical assistance.

When you start the diagnostics a message is displayed telling you that the diagnostics are loading. The **Diagnostics** menu appears. The menu allows you to run all or specific diagnostic tests or to exit the Dell Diagnostics.



NOTE: Before you read the rest of this section, you might want to start the Dell Diagnostics so that you can see it on your monitor screen.

For a quick check of the system, select **Test All Devices** and then select **Quick Tests**. This option runs only the device tests that do not require user interaction and that do not take a long time to run. Dell recommends that you choose this option first to increase the chance of tracing the source of the problem quickly. For a complete check of the system, select **Test All Devices** and then select **Extended Tests**. To check a particular area of the system, choose **Advanced Testing**.

See "Running Dell Diagnostics" in the system *Installation and Troubleshooting Guide* for specific information about the Dell Diagnostics.

Getting Help

If none of the troubleshooting procedures in this section or the tests in the Dell Diagnostics reveals the source of the problem or leads to the proper troubleshooting steps for determining the source of the problem, see the **Support** pages at <http://support.dell.com> or call Dell for technical assistance. For instructions on contacting Dell, see "Getting Help" in the *Installation and Troubleshooting Guide*.

[Back to Contents Page](#)

Messages and Codes: Dell™ PowerEdge™ 350 Systems Service Manual

[Overview](#)

[Diagnostics Messages](#)

[System Messages](#)

[POST Beep Codes](#)

Overview

Your system can provide you with diagnostic, error, and status information in the form of messages that appear on the monitor screen, or beep codes that sound through the system speaker. This section documents the diagnostic and beep codes and system messages generated by the system basic input/output system (BIOS).

If a faulty system does not emit beep codes or display system error messages to indicate a failure, you should run the appropriate tests in the Dell Diagnostics to help isolate the source of the problem. See "Running the Dell Diagnostics" in the system *Installation and Troubleshooting Guide*.

Several different types of messages can indicate when the system is not functioning properly:

- System messages
- Diagnostics messages
- Alert messages
- POST beep codes

System Messages

System messages during the system's power-on self-test (POST) alert you to a possible operating system problem or to a conflict between the software and hardware. [Table 1](#) lists the system error messages that can occur and the probable cause for each message.



NOTE: If you receive a system message that is not listed in Table 1, check the documentation for the application program that is running when the message appears and/or the operating system documentation for an explanation of the message and recommended action.

Table 1. System Messages

Message	Cause	Corrective Action
8042 Gate A20 Error	Faulty keyboard controller	Replace the system board.

	(defective system board)	
Address line short!	Faulty memory circuitry on system board	Replace the system board.
C: Drive Error	Hard-disk drive is not responding correctly to system commands	Run the Dell Diagnostics. See "Running the Dell Diagnostics" in the <i>Installation and Troubleshooting Guide</i> for instructions. Replace the hard-disk drive .
C: Drive Failure	Faulty hard-disk drive	Replace the hard-disk drive .
Cache Memory Bad, Do Not Enable Cache!	Faulty cache memory	Replace the microprocessor .
CH-2 Timer Error	Faulty system board	Replace the system board.
CMOS Battery State Low	The system battery power is low	Replace the system battery .
CMOS System Options Not Set	Missing settings in system setup program	Check the System Setup program configuration settings. See " Using the System Setup Program. "
CMOS Display Type Mismatch	Incorrect video configuration setting in system setup program	Correct the System Setup program video configuration settings. See " Using the System Setup Program. "
CMOS Memory Size Mismatch	System memory value in system setup program is incorrect	Correct the System Setup program memory configuration settings. See " Using the System Setup Program. "
CMOS System Options Not Set	Missing settings in the System Setup program.	Check the System Setup program configuration setting.
CMOS Time and Date Not Set	Defective system battery	Replace the battery. See " Replacing the Battery. "
D: Drive error	Hard-disk drive is not responding correctly to system commands	Run the Dell Diagnostics. See Chapter 5 in the <i>Installation and Troubleshooting Guide</i> for instructions. Replace the hard-disk drive .
D: Drive failure	Faulty hard-disk drive	Replace the hard-disk drive .
Diskette Boot Failure	No operating system on diskette	Use a bootable diskette.

DMA Error DMA 1 Error DMA 2 Error	Faulty DMA controller	Replace the system board.
FDD Controller Failure	Faulty diskette/tape drive controller (defective system board)	Replace the system board.
HDD Controller Failure	Loose cable, improperly connected hard-disk drive, or faulty IDE controller.	Check the hard-disk drive cable connections. See " Hard-Disk Drive. " If the problem persists, replace the system board.
INTR1 Error INTR2 Error	Faulty system board	Replace the system board.
Invalid Boot Diskette	No operating system on diskette	Use a bootable diskette.
Keyboard/Interface Error	Keyboard cable connector loose or improperly connected, defective keyboard, or defective keyboard/mouse controller (defective system board)	Check the keyboard cable connection. Replace the keyboard. If the problem persists, replace the system board.
No ROM BASIC	No bootable sector on diskette or CD	Use a different bootable diskette or CD, or remove nonbootable diskette from drive to allow system to boot from hard-disk drive.
Off Board Parity Error Addr = xxxx On Board Parity Error Addr = xxxx Parity Error Addr = xxxx	Faulty DIMMS or defective system board	Remove and reseal the memory modules on the expansion card or on system board. If the problem persists, replace one or more memory modules. If the problem still persists, replace the system board.

Diagnostics Messages

When you test a device group or device in the Dell Diagnostics, an error message may result. These particular error messages are not covered in this section. Record the message on a copy of the Diagnostics Checklist (found in your system's *Installation and Troubleshooting Guide*), and then follow the instructions in that section for obtaining technical assistance.

POST Beep Codes

If the monitor cannot display errors or problems during POST, the system may emit a series of beeps, or

beep code, that identifies the problem.

When a beep code is emitted, record it on a copy of the Diagnostics Checklist (found in your system's *Installation and Troubleshooting Guide*), and then look it up in [Table 2](#). If you are unable to resolve the problem by looking up the meaning of the beep code, use the Dell Diagnostics to identify a more serious cause. See "[Running the Dell Diagnostics](#)."

Table 2. System Beep Codes

Code	Cause	Corrective Action
1	BIOS checksum failure; the memory refresh circuitry on the system board is faulty.	Replace the system board.
2	Parity error; faulty memory modules or defective system board	Replace the memory modules or replace the system board.
3	Base 128 KB memory failure	Replace the first memory module . If the problem persists, replace the system board.
4	Timer not operating	Replace the system board.
5	Processor error	Replace the microprocessor .
6	8042 - Gate A20 failure	Replace the system board.
7	Processor exception interrupt error	Remove and reseal the microprocessor . If the problem still persists, replace the microprocessor.
8	Display memory read-write error	Unless your system is connected to a monitor, no action is required. If a monitor is connected, the video adapter is faulty.
9	ROM checksum error	Reflash the BIOS firmware. If the problem persists, replace the system board.
10	CMOS shutdown register read/write error	Replace the system board.
11	Cache memory bad	The cache memory test has failed. Replace the system board.

[Back to Contents Page](#)

Removing and Replacing Parts: Dell™ PowerEdge™ 350 Systems Service Manual

- [Overview](#)
- [System Cover](#)
- [Optional Front Bezel](#)
- [Control Panel Assembly](#)
- [Diskette Drive and CD-ROM Drive](#)
- [Hard-Disk Drive](#)
- [Cooling Fans](#)
- [Power Supply](#)
- [System Board](#)
- [Expansion Cards](#)
- [Riser Board](#)
- [Memory Modules](#)
- [Microprocessor](#)
- [Battery](#)

Overview

This section provides servicing procedures for components inside the system. Before you start any of the procedures in this section, perform the following tasks:

- Perform the procedures described in "[External Visual Inspection](#)."
- Read "[Safety Instructions](#)."

You need the following items to perform the procedures in this section:

- Dell Diagnostics (provided on PowerEdge software CD)
- Formatted 3.5-inch diskette
- System *User's Guide*
- System *Installation and Troubleshooting Guide*
- #1 and #2 Phillips screwdriver
- Wrist grounding strap as explained in "[Protecting Against Electrostatic Discharge](#)"

After you replace a system component, you should run the Dell Diagnostics and select the appropriate device group(s) or subtest(s). The diagnostics tests analyze the new component to make sure that it is functioning properly.

System Cover

The system has a cover that provide access to the system board, memory, installed drives, and expansion cards.

Removing the Cover

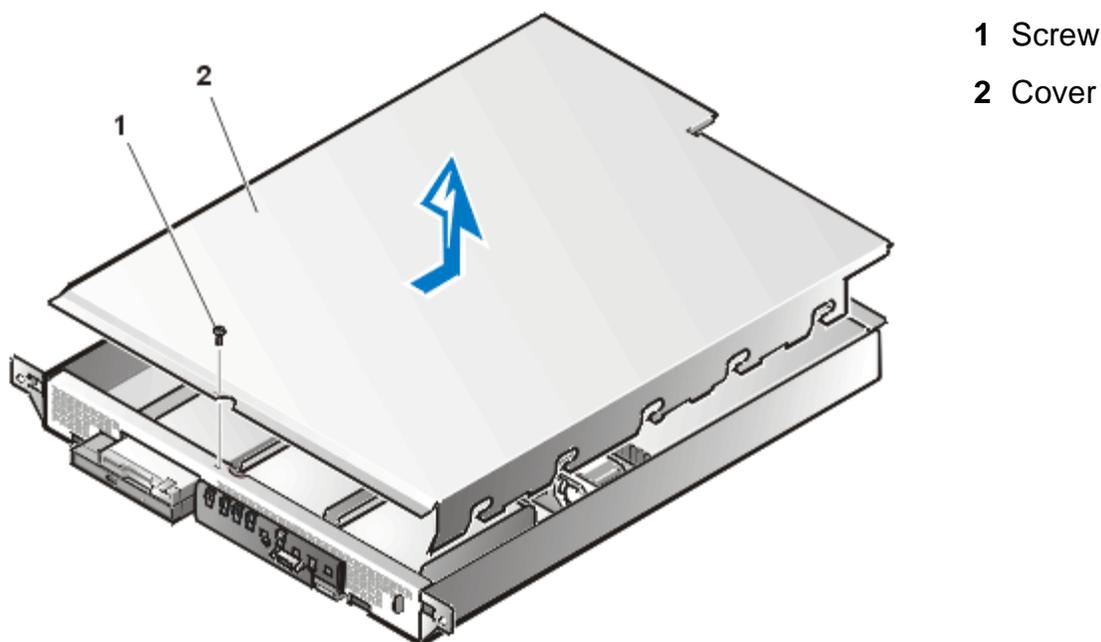
⚠ WARNING: The power supply in your system may produce high voltages and energy hazards, which can cause bodily harm. Only trained service technicians are authorized to remove the cover and access any of the components inside the system chassis.

To remove the system cover, perform the following steps:

⚠ CAUTION: See "[Safety Instructions](#)" before working inside your system.

1. Unscrew the captive screw fasteners securing the system to the rack.
2. Slide the system out of the rack.
3. Using a Phillips screwdriver, remove the screw securing the cover to the front panel (see [Figure 1](#)).
4. Slide the top cover back and lift the cover up and off the system chassis.

Figure 1. Removing the Cover



Replacing the Cover

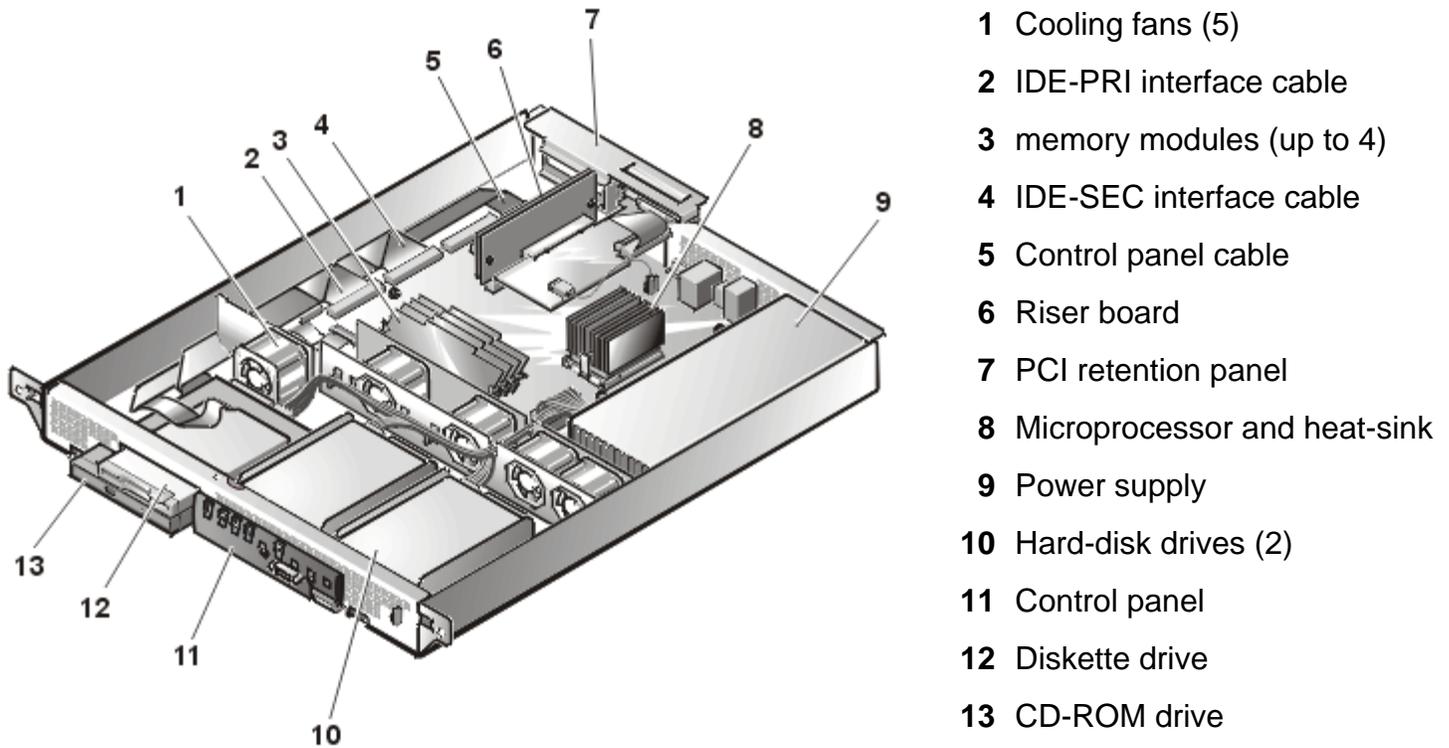
To replace the cover, perform the following steps:

1. Lower the cover over the system chassis with the hole facing forward (towards the front panel).

2. Engage the notches in the cover into mating fingers on the inside of the chassis.
3. Slide the cover forward until the hole in the cover aligns with a matching hole in the front of the chassis.
4. Secure the cover with the screw you removed when you opened the cover (see [Figure 1](#)).

In Figure 2, the cover is removed to provide an interior view. Figure 2 also identifies the drive bays. Refer to this illustration to locate interior features and components discussed later in this manual.

Figure 2. Inside the System



The system board holds the system's control circuitry, microprocessors, and other electronic components. Several hardware options such as the microprocessors and memory are installed directly on the system board. The expansion card riser board accommodates one full-length PCI expansion card and one low-profile PCI card. The peripheral bays provide space for an integrated 3.5-inch diskette drive and CD-ROM drive assembly, and two 1-inch high hard-disk drives.

The hard-disk drive bays provide space for two 1-inch IDE hard-disk drives. These hard-disk drives are connected to an IDE controller on the system board.

The power cables leading from the power supply distribute power to the system board and all installed drives.

For drives such as the diskette drive and the CD-ROM drive, an interface connector connects each drive to the system board.

During a service procedure, you may be required to change a jumper or switch setting. For information on the system board jumpers, see "[Jumpers](#)."

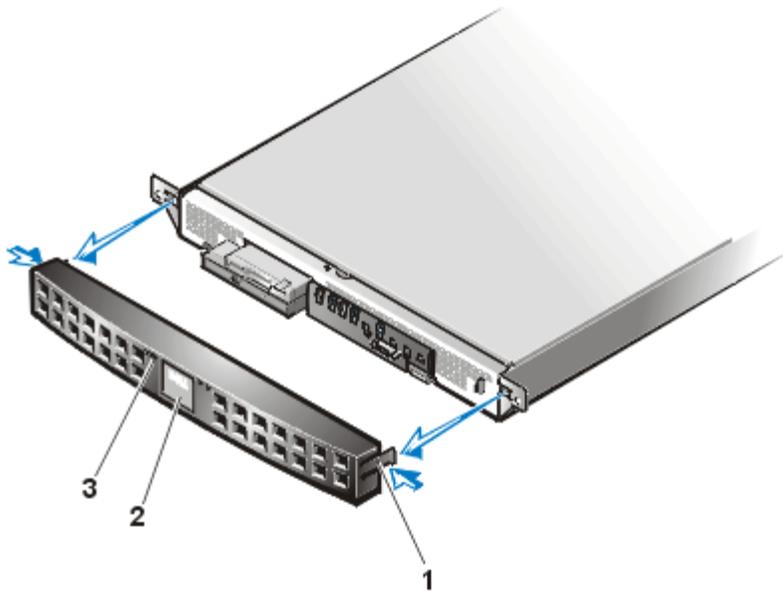
Optional Front Bezel

To remove the optional front bezel of the system, perform the following steps:

 **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

1. Press the retention tab on each end of the bezel and remove the bezel from the chassis (see Figure 3).

Figure 3. Front-Bezel Removal



- 1 Tabs
- 2 Nameplate
- 3 Status indicators (3)

NOTICE: When replacing the front bezel, ensure that the bezel is oriented so that its status indicators are positioned just above the Dell nameplate in the center of the bezel.

Control-Panel Assembly

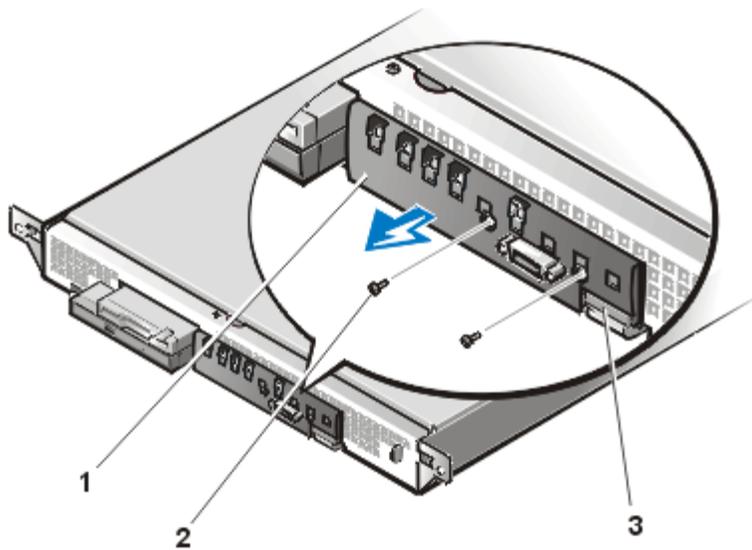
To remove the control-panel assembly, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

 **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

Figure 4. Control-Panel Assembly Removal

- 1 Control panel
- 2 Screws (2)



3 Control panel cable

1. [Remove the front bezel.](#)
2. [Remove the cover.](#)
3. Disconnect the control panel cable from the connector on the right side of the control panel.
4. Remove the two screws holding the control panel assembly to the front of the chassis (see [Figure 4](#)). Retain these screws for use in securing the replacement control panel assembly.
5. Pull the control panel away from the chassis.

To install a replacement control panel, push the control panel onto its grounding stud on the left end of the control panel, and then secure the control panel with the two screws removed in step 4. Reconnect the control panel cable to the connector on the right side of the control panel.

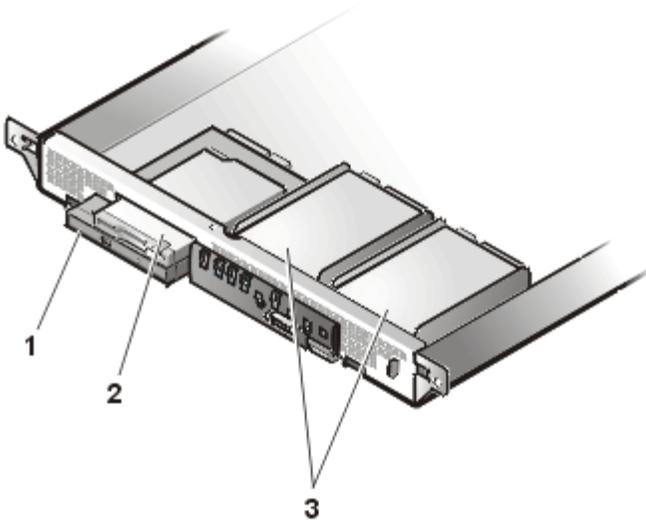
Diskette Drive and CD-ROM Drive

⚠ CAUTION: See "[Safety Instructions](#)" before working inside your system.

Figure 5 shows the locations of drives that can be installed in the system. Refer to this figure when you perform any of the procedures in the following subsections.

Figure 5. Drive Locations

- 1 CD-ROM drive
- 2 3.5-inch diskette drive
- 3 IDE hard-disk drives (2 slots)



 **NOTE:** When you reinstall a replacement IDE hard-disk drive, ensure the drive has the identical part number and ensure any jumpers are at the settings you recorded.

Diskette Drive and CD-ROM Drive Removal

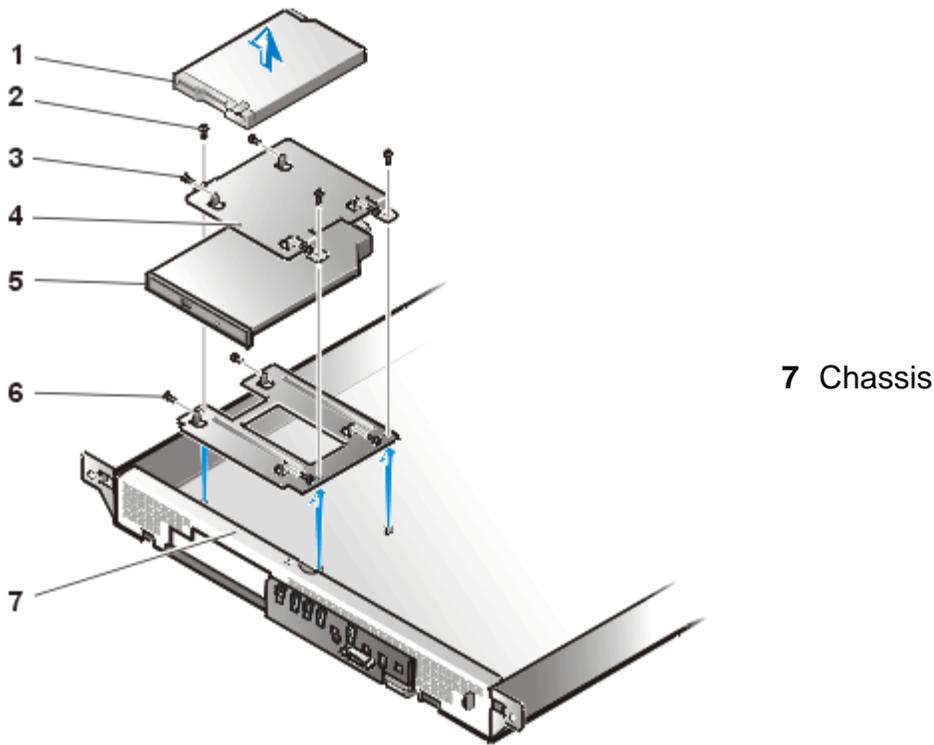
 **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

To remove the 3.5-inch diskette drive or the CD-ROM drive, perform the following steps:

1. [Remove the cover.](#)
2. Remove the power cables from both the 3.5-inch diskette drive and the CD-ROM drive.
3. Remove the interface cable from the back of the 3.5-inch diskette drive.
4. Remove the three screws securing the 3.5-inch diskette drive bracket and the CD-ROM drive bracket to the floor of the chassis.
5. Lift the 3.5-inch diskette drive and bracket out of the chassis and set it on a smooth, nonconducting work surface (see Figure 6).

Figure 6. Diskette Drive and CD-ROM Drive Removal

- 1 3.5-inch diskette drive
- 2 Screws (3)
- 3 Screws for mounting diskette drive (4)
- 4 Bracket for diskette drive
- 5 CD-ROM drive
- 6 Bracket for CD-ROM drive



6. If you are also removing the CD-ROM drive, remove the IDE cable from the back of the CD-ROM drive.
7. If you are also removing the CD-ROM drive, lift the CD-ROM drive and its bracket out of the chassis.
8. Remove the faulty drive (either the 3.5-inch diskette drive or the CD-ROM drive) from its mounting bracket by removing four screws (see [Figure 6](#)).

Hard-Disk Drive

Each hard-disk drive is mounted in a mounting bracket. The mounting bracket is secured to slots in the chassis front panel and to two snap-in posts at the back of the mounting bracket.

Hard-Disk Drive Removal

To remove a faulty hard-disk drive and its mounting bracket, perform the following steps.

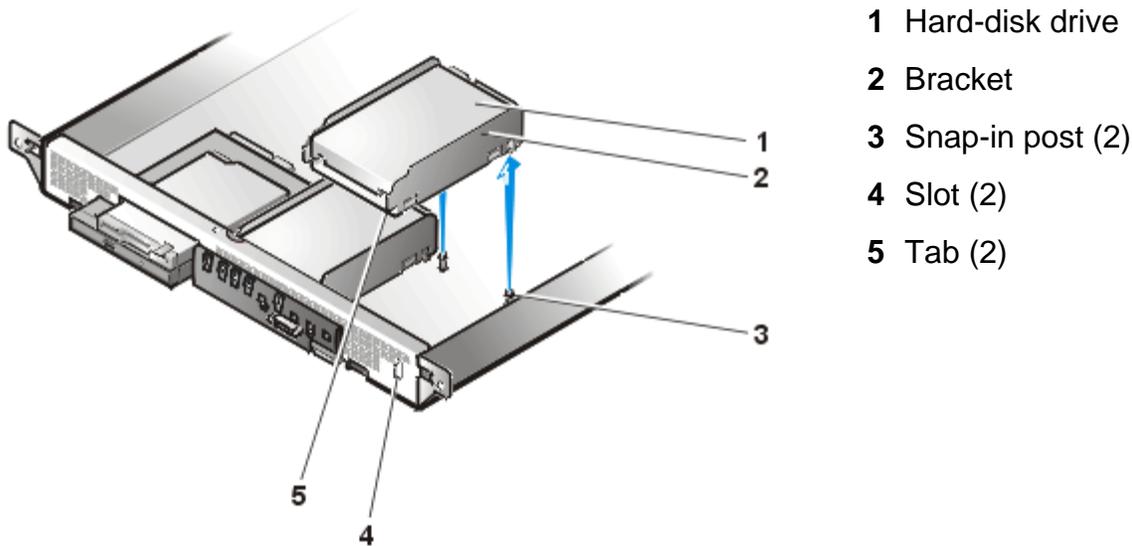
 **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

1. Shut down the system and disconnect the cables.
2. [Remove the optional bezel](#).
3. If you have not already done so, [remove the cover](#).

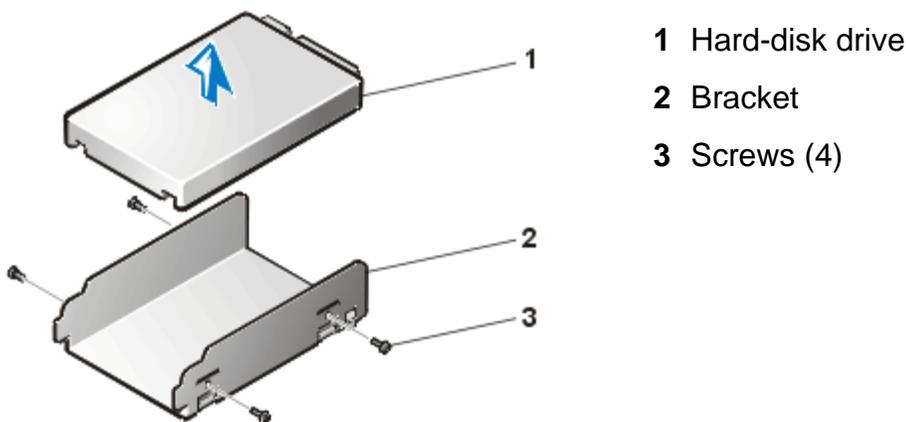
4. Remove the faulty hard-disk drive by lifting up at the rear of the mounting bracket, and then moving the hard-disk drive and bracket toward the back, still connected to its power and IDE interface cables (see Figure 7).
5. Disconnect the power and IDE interface connectors, and set the hard-disk drive and bracket on a nonconductive work surface.

Figure 7. Hard-Disk Drive and Bracket Removal



6. Remove the four screws that secure the hard-disk drive to its bracket (see Figure 8).

Figure 8. Hard-Disk Drive Removal From Bracket



Installing the Replacement Hard-Disk Drive to the Bracket

To install the replacement hard-disk drive, perform the following steps:

1. Secure the replacement drive to the bracket using the four screws removed earlier (see [Figure 8](#)).
2. Install the power and IDE interface cable connectors to the back of the drive.

3. Insert the two vertical tabs on the front of the bracket into matching slots in the front panel of the chassis.
 4. Press down at the rear of the drive until the bracket snaps into place on its snap-in posts.
 5. [Replace the cover.](#)
 6. If you removed the front bezel in step 2 of "[Hard-Disk Drive Removal.](#)" reinstall it now.
 7. Run the Dell Diagnostics to test and prepare the new drive.
-

Cooling Fans

Five cooling fans are installed in the center of the system chassis. (Fan 1 is the outermost fan in the fan assembly, located directly behind the CD-ROM drive.) If you observe that one of the fans is not operating or if the Dell Diagnostics software issues a fan-related error message, perform the following steps to replace the faulty fan.

 **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

NOTICE: See "[Protecting Against Electrostatic Discharge.](#)"

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
2. [Remove the cover.](#)
3. Disconnect the cooling fan power cable by pressing the release tab on the power cable connector.

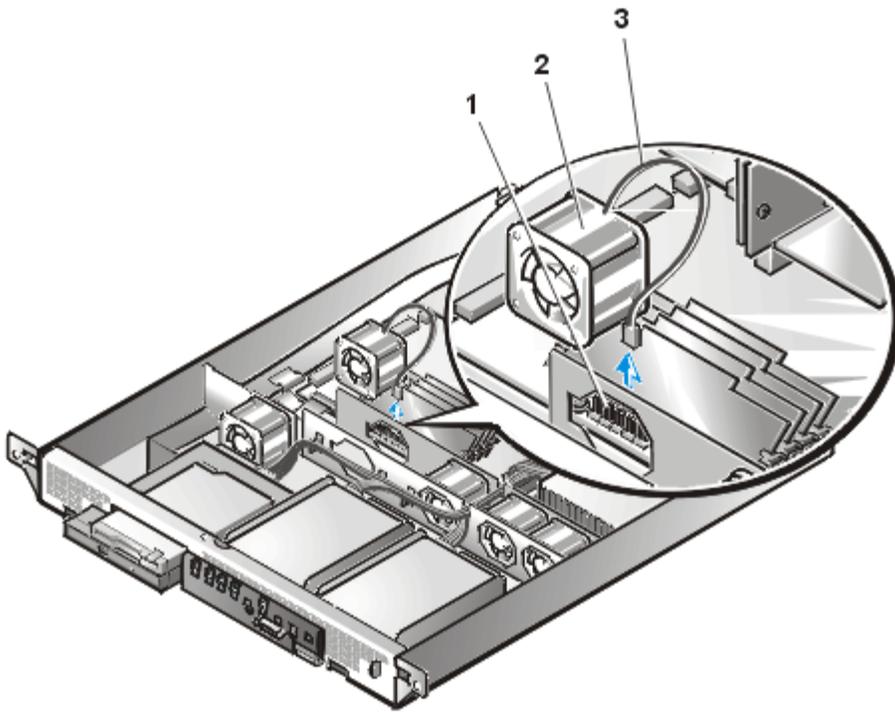
 **NOTE:** Perform the next step only if you are removing fan 1, located behind the CD-ROM drive. If you are replacing any other fan, skip to step 5.

4. If you are removing fan 1, you must remove two screws that secure the fan to its bracket.
5. Lift the fan out of the system chassis.

NOTICE: When installing a new fan, ensure that the airflow arrow on the fan is pointing to the rear of the system. If the fan is installed incorrectly, system components might be damaged due to overheating.

NOTICE: Ensure that the fan's wiring harness is routed from the side of the fan when the fan is installed. If the fan's wiring harness is routed from the top or the bottom of the fan, the cover will not close properly and the fan or the wiring harness might be damaged.

Figure 9. Fan Assembly Removal



- 1 Fan power connectors
- 2 Cooling fans (5)
- 3 Fan power cable

6. Press the new fan into its position in the chassis and connect the fan power connector to a vacant fan power connector in the system board (see [Figure 9](#)). Ensure that the replacement fan is oriented the same way as the original fan.

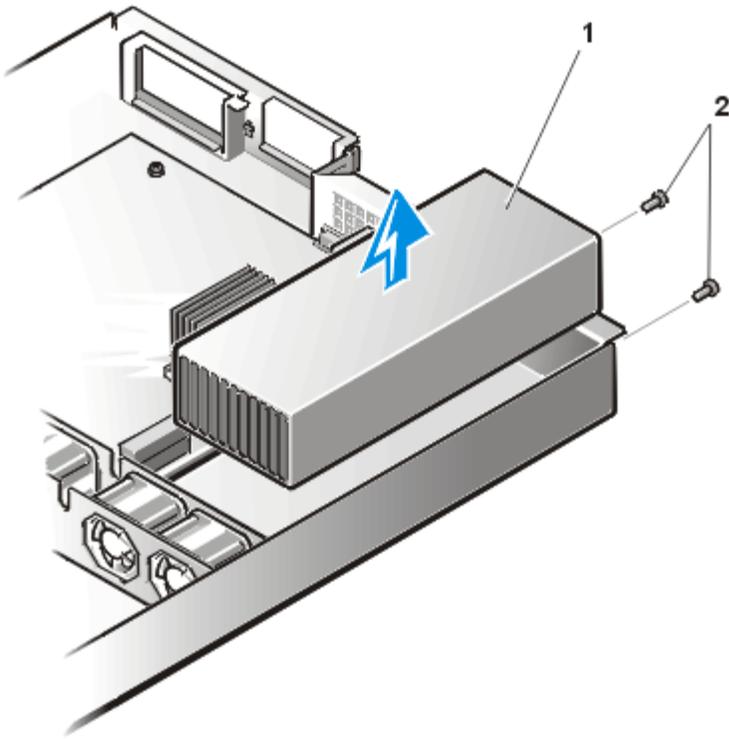
If you are replacing the fan directly behind the CD-ROM drive, secure the fan with the two screws you removed with the old fan.

7. When reinstalling the fan, be careful to avoid pinching the system interface cables.
8. [Replace the cover](#) and reconnect the system to AC power.
9. Turn on the system.

Power Supply

Figure 10. Power Supply Removal

- 1 Power supply
- 2 Screws (2)



To remove a power supply, perform the following steps.

! **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

! **CAUTION:** The microprocessor and heat sink assembly and other system board components can get extremely hot during system operation. Be sure the system has had sufficient time to cool before you touch it.

NOTICE: See "[Protecting Against Electrostatic Discharge.](#)"

! **CAUTION:** Avoid touching the output connectors on the power supply. Wait 10 to 20 seconds after disconnecting the AC power cable from its input receptacle before removing the power supply or coming into contact with its output connectors.

1. Unplug the power cord and all peripheral cables from the back of the system.
2. [Remove the cover.](#)
3. Disconnect the DC power cable from its connector on the system board.
4. Disconnect the DC power cable from the hard-disk drives.

5. Disconnect the DC power cable from the back of the 3.5-inch diskette drive and the CD-ROM drive.
6. Remove the two screws that secure the power supply to the chassis back panel (see [Figure 10](#)).
7. Lift the power supply out of the chassis.

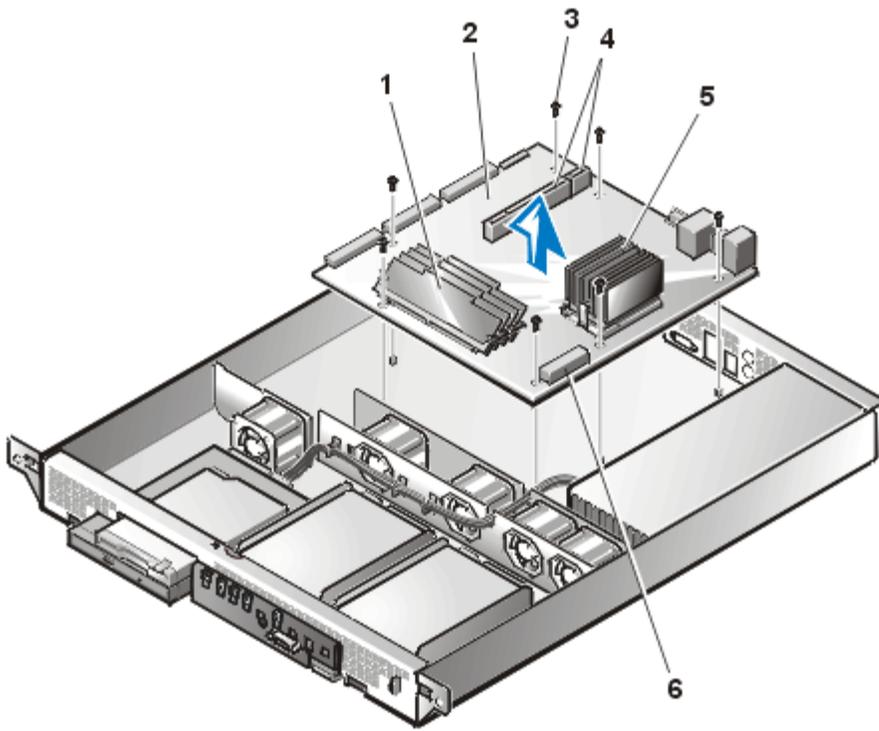
To install a replacement power supply, perform the following steps:

1. Lower the new power supply into the chassis.
Ensure that the power supply is properly seated into its slot in the chassis.
2. Secure the power supply with the two screws removed in step 6 of the previous procedure.
3. Connect the DC power cables to their connectors on the system board, hard-disk drives, and CD-ROM drive.
4. [Replace the cover](#).
5. Connect the AC power cable to the power input receptacle on the back panel of the system.
6. Connect the free end of the AC power cable to an electrical outlet.
7. Connect all peripheral cables to the back of the system.
8. Turn on the power and observe the front panel status indicators for normal operation.

System Board

Figure 11. System Board Removal

- 1 memory modules (up to 4)
- 2 System board
- 3 Screws (7)
- 4 Riser board sockets J13, J20
- 5 Microprocessor/heat-sink assembly
- 6 Power connector



To remove the system board, perform the following steps.

! **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

! **CAUTION:** The microprocessor and heat sink assembly and other system board components can get extremely hot during system operation. Be sure the system has had sufficient time to cool before you touch it.

NOTICE: See "[Protecting Against Electrostatic Discharge.](#)"

! **CAUTION:** Avoid touching the output connectors on the power supply. Wait 10 to 20 seconds after disconnecting the AC power cable from its input receptacle before removing the power supply or coming into contact with its output connectors.

1. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
2. [Remove the cover.](#)
3. Remove all external peripheral cables from their connectors at the back of the system.
4. Record the locations and remove all internal cables (including power cables) attached to the system board.

5. [Remove the expansion cards](#) from their sockets on the riser board, and remove any cables connected to the expansion cards.
6. Remove the riser board from connectors J13 and J20 on the system board.
7. Remove the IDE ribbon cable connector from the secondary IDE connector (IDE SEC) on the system board.
8. Remove the diskette drive ribbon cable connector from connector HD FLOPPY on the system board.
9. Remove the seven screws securing the system board to the chassis floor.
10. Carefully lift the system board up and out of the chassis. Be sure to lift evenly and not twist the system board.

Place the system board on a smooth, antistatic surface.

11. [Remove the microprocessor](#).
12. Remove the [memory modules](#).

To replace a system board, perform the following steps:

1. Lower the system board into the chassis and secure it with the seven screws.
2. Install the memory modules that you removed from the old system board.
3. Using the cleaning cloth provided with the new system board, wipe the top of the microprocessor die to remove any of the old thermal grease.

After cleaning, the microprocessor die should have a reflective shine.

4. Insert the microprocessor into the ZIF socket on the new system board and lower the lever to lock it in place.
5. Peel off the protective backing (if present) from the new heat-sink to expose the pad of thermal grease.
6. Place the heat sink on the microprocessor and ensure that the bevel on the heat-sink covers the raised portion of the ZIF socket.
7. Replace the heat-sink clip onto the heat sink and secure it on the ZIF socket.

The longest side of the clip should be pointing to the front of the system.

8. Set the system board jumpers to the same settings on the board you removed.
9. Install the expansion card riser board and replace the expansion cards. Next, connect all internal cables to the system board and to the expansion cards.

10. Close the cover.
 11. Reconnect the I/O cables and power cables to the back panel.
 12. Insert the configuration diskette or CD provided with the new system board, and turn on the system.

The system boots from the diskette or CD and prompts you to select the type of system you are servicing.
 13. When prompted, enter the system type and enter the service tag number, which is located on the back of the system.

The system notifies you when programming is complete.
 14. Remove the diskette or CD and reboot the system.
 15. When the system reboots, press <F2> to enter the system setup program.
 16. From the Main Menu, enter the correct time and data in the **System Time** and **System Date** options.
 17. Set the **Processor Serial Number** option to "Disabled."
 18. Press <F10> to save these settings, exit the system setup program, and reboot the system.
-

Expansion Cards

To remove an expansion card, perform the following steps.

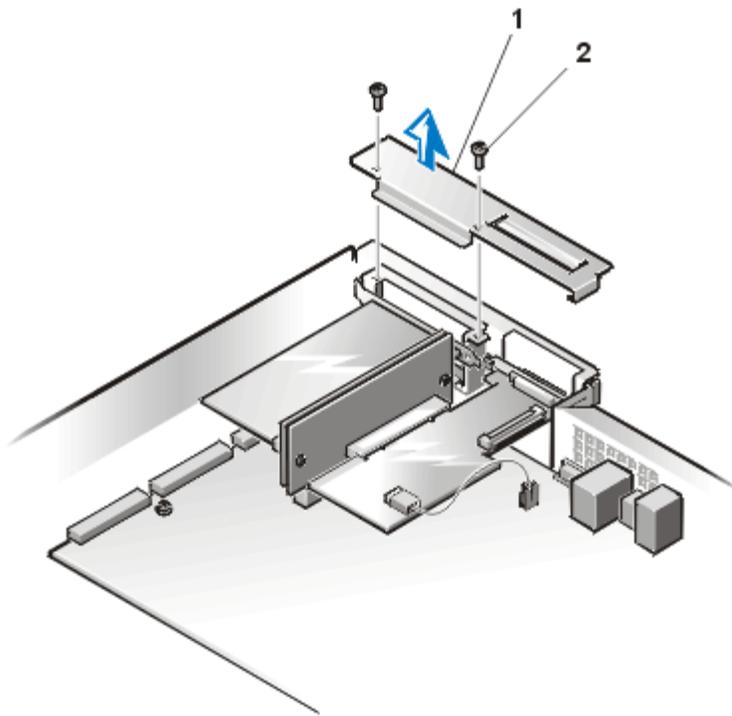
 **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

1. [Remove the cover](#).
2. Remove the two screws securing the PCI retention panel to the chassis back panel (see Figure 12).

Figure 12. PCI Retention Panel Removal

- 1 PCI retention panel
- 2 Screws (2)



3. Disconnect any cables connected to expansion cards through the back-panel openings.
4. Disconnect any internal cables connected to expansion cards.
5. [Remove the riser board](#), together with installed expansion cards, from the system board.
6. [Remove the expansion card](#) from its slot on the riser board (see [Figure 13](#)).
7. If you are removing the card permanently, install a metal filler bracket over the empty card-slot opening.

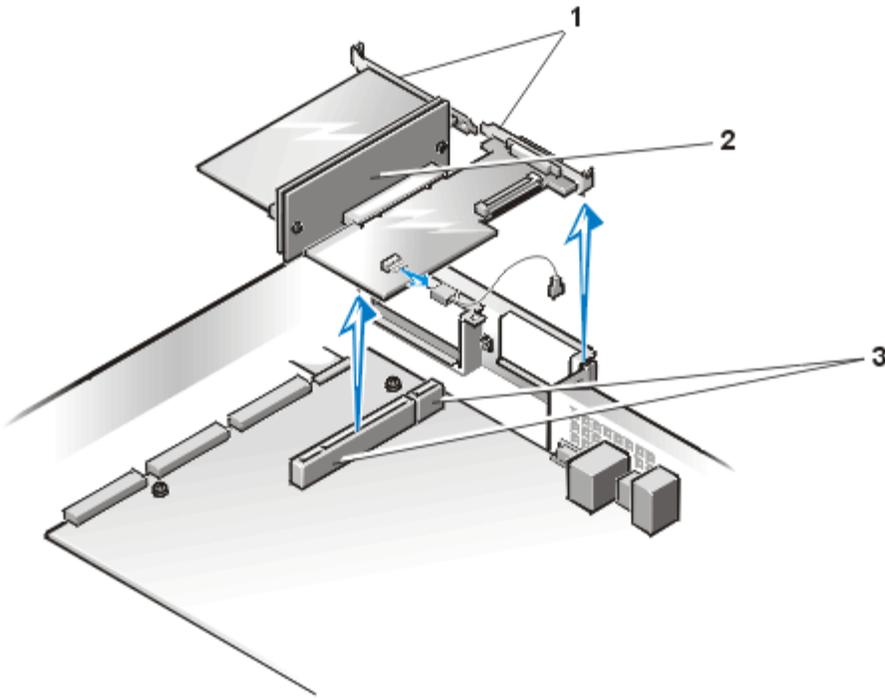


NOTE: Installing a filler bracket over an empty expansion slot is necessary to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

8. [Replace the cover](#), and then reconnect the system and peripherals to their AC power sources and turn them on.

Figure 13. Expansion Card Removal

- 1 Expansion cards (2)
- 2 Riser board
- 3 Riser board sockets J20 (left) and J13 (right)



Expansion Card Replacement

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

⚠ CAUTION: See "[Safety Instructions](#)" before working inside your system.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

1. [Remove the cover](#), if it is not already removed.
2. Prepare the replacement expansion card for installation.

See the documentation that came with the expansion card for information on configuring the card, making internal connections, or otherwise customizing the card for the system.
3. To remove a PCI retention panel (if it is not already removed), remove the two screws securing it to the chassis back panel (see [Figure 12](#)).
4. Remove the riser board, together with installed expansion cards, from the system board.
5. To install the replacement expansion card, insert the card-edge connector firmly into the socket on the riser board.
6. Connect any cables that should be attached to the card.

See the documentation that came with the card for information about cable connections.

7. Install the riser board into the chassis.

8. To replace a PCI retention panel, position the tab on the end into its slot and install two screws to secure it to the chassis back panel (see [Figure 12](#)).
9. [Replace the cover](#), and then reconnect the system and peripherals to their AC power sources and turn them on.

Riser Board

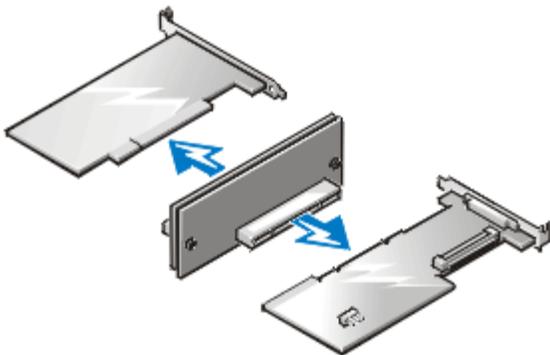
To remove the expansion card riser board, perform the following steps.

 **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

1. Remove the [system cover](#) if it is not already removed.
2. Grasp the riser firmly and lift it up and out of the chassis (see [Figure 14](#)).
3. Disconnect any cables connected to the expansion cards.
4. [Remove the expansion cards](#) installed on the riser board.

Figure 14. Riser Board Removal



Memory Modules

The system is upgradable to 1 GB by installing combinations of 128, 256, and 512 MB ECC unbuffered SDRAM memory modules. You can purchase memory upgrade kits from Dell as needed.

 **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

 **NOTE:** The memory modules must be rated to run at 100 MHz or faster.

Memory Module Installation Guidelines

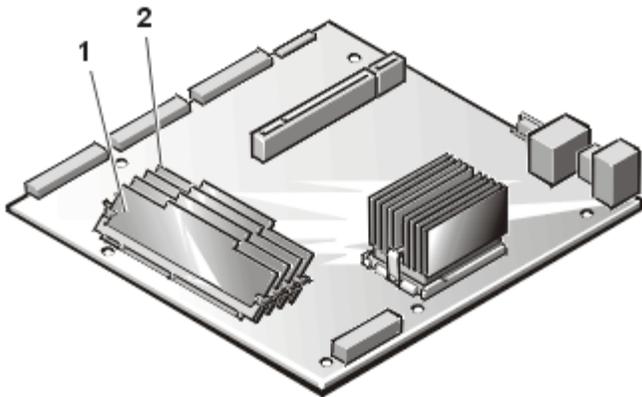
Starting with the socket nearest to the system board's center, the DIMM sockets are labeled "DIMM3" through "DIMM0" (see [Figure 15](#)). When you install memory modules, follow these guidelines:

- Install a DIMM in socket DIMM3 (the socket toward the center of the board) before socket DIMM2, socket DIMM2 before socket DIMM1, and so on.

The reason for installing memory in the back-most socket first is for ease of future installations.

- If you install different sizes of memory modules, install them in order of descending capacity, beginning with the highest-capacity DIMM in socket DIMM3.
- You do not need to install memory modules in pairs.

Figure 15. DIMM Socket Locations



- 1 DIMM0
- 2 DIMM3

Table 1 illustrates the valid memory configurations based on these guidelines.

Table 1. Valid Memory Module Configurations

Total Desired Memory	DIMM Sockets			
	DIMM3	DIMM2	DIMM1	DIMM0
128 MB	128 MB	None	None	None
256 MB	256 MB	None	None	None
512 MB	256 MB	256 MB	None	None
1 GB	256 MB	256 MB	256 MB	256 MB

Memory Replacement

To replace a memory module on the system board, perform the following steps.

 **CAUTION:** See "[Safety Instructions](#)" before working inside your system.

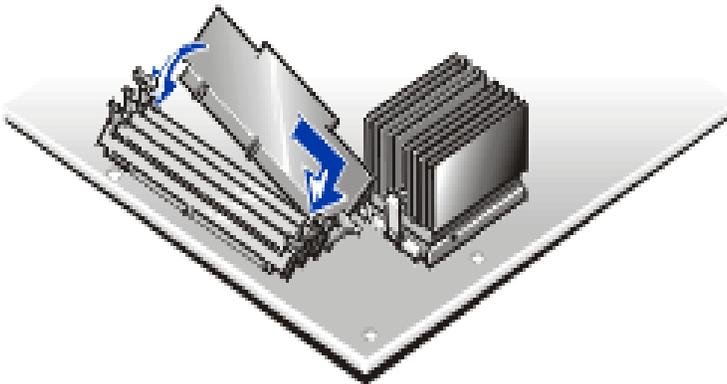
NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
2. [Remove the front bezel](#), if one is present.
3. [Remove the cover](#).
4. Locate the DIMM socket(s) in which you will replace memory modules.

[Figure 15](#) shows the location and labeling of the DIMM sockets on the system board.

5. [Replace](#) the memory modules as necessary to reach the desired memory total.
6. When installing a memory module in DIMM3, perform the following steps:
 - a. Press down and outward on the right-hand ejector (the one nearest the microprocessor/heat-sink assembly). The DIMM socket has two alignment keys that allow the DIMM to be installed in the socket only one way (see [Figure 16](#)).
 - b. Press the right-hand corner of the module into the DIMM3 socket (see [Figure 16](#)).
 - c. Holding the right-hand corner of the module in place, press down and outward on the left-hand ejector and rotate the left-hand side of the module into position (see [Figure 16](#)).
 - d. After you are sure that the module is centered in the socket, press down on the DIMM while pulling up on the ejectors to lock the DIMM into the socket.

Figure 16. DIMM3 Installation



After DIMM3 has been installed, install the remaining memory modules using the following procedure:

1. Press down and outward on the ejectors on the DIMM socket to allow the DIMM to be inserted into the socket (see [Figure 17](#)).
2. Align the DIMM's edge connector with the slot in the center of the DIMM socket, and insert the DIMM in the socket (see [Figure 17](#)).

The DIMM socket has two alignment keys that allow the DIMM to be installed in the socket in only one way.

3. Press down on the DIMM with your thumbs while pulling up on the ejectors with your index fingers to lock the DIMM into the socket (see [Figure 17](#)). When the DIMM is properly seated in the socket, the ejectors on the DIMM socket should align with the ejectors on the other sockets with memory modules installed.
4. Repeat steps 1 through 3 to install the remaining memory modules.
5. [Replace the cover](#), replace the optional [front bezel](#) (if one is present), and reconnect the system to the electrical outlet, and turn on the system.

After the system completes the power-on self-test (POST) routine, it runs a memory test that displays the new memory total, which includes all newly installed memory.

 **NOTE:** *If the memory total is incorrect, turn off and disconnect the system and peripherals from their AC power sources, open the system cover, and check all the installed memory modules to make sure they are seated properly in their sockets. Ensure that the installed memory modules conform to one of the valid configurations listed in Table 2.*

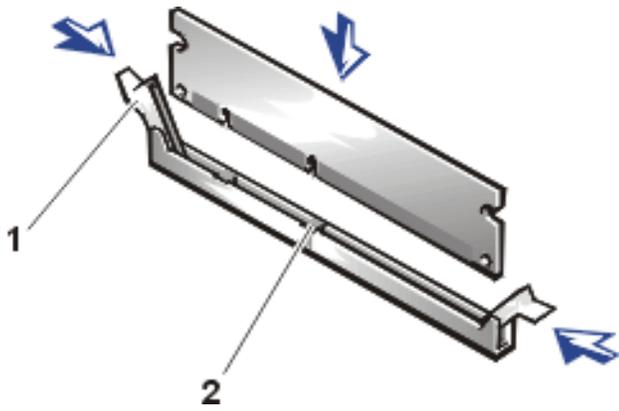
The system detects that the new memory does not match the system configuration information, which is stored in nonvolatile RAM (NVRAM). The following error message appears:

Press <F1> to continue; <F2> to enter System Setup

6. Press <F2> to enter the [System Setup program](#) and check the **System Memory** setting in the system data box on the System Setup screens. The system should have already changed the value in the **System Memory** setting to reflect the newly installed memory.
7. If the **System Memory** value is incorrect, one or more of the memory modules may not be installed properly. Repeat steps 1 through 4 in the previous procedure.
8. Carefully examine each DIMM to ensure proper seating in its socket.
9. Run the system memory test in the Dell Diagnostics (see your *Installation and Troubleshooting Guide* for complete information).

Figure 17. DIMM Installation

- 1 DIMM socket ejectors (2)
- 2 Alignment keys (2)



Memory Module Removal

To remove a memory module, press down and outward on the ejectors on each end of the socket until the memory module pops out of the socket (see [Figure 18](#)).

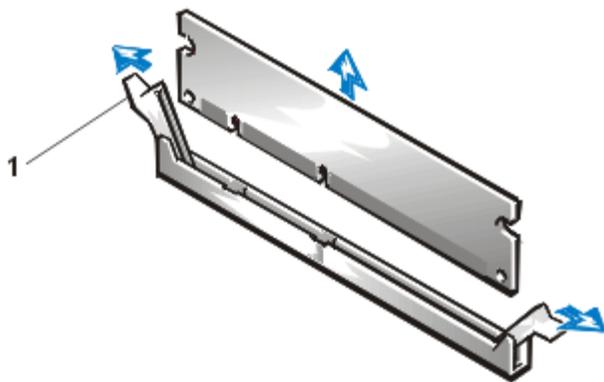
CAUTION: See "[Safety Instructions](#)" before working inside your system.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

NOTES: This procedure assumes the power is off and you have access to the DIMM slots. See steps 1 through 6 in [Memory Replacement](#) for these preliminary steps.

If you encounter difficulty in moving the ejector nearest to the chassis wall, press down on the opposite ejector and lift that end of the DIMM slightly to free the DIMM from its socket.

Figure 18. DIMM Removal



1 DIMM socket ejectors (2)

Microprocessor

The microprocessor and heat-sink assembly is secured to the system board in a zero-insertion-force (ZIF) socket.

To remove the microprocessor and heat sink assembly, perform the following steps.

CAUTION: See "[Safety Instructions](#)" before working inside your system.

 **CAUTION:** The microprocessor and heat-sink assembly can get extremely hot during system operation. Be sure the assembly has had sufficient time to cool before you touch it.

 **CAUTION:** When handling the microprocessor and heat-sink assembly, take care to avoid sharp edges on the heat-sink.

NOTICE: See "[Protecting Against Electrostatic Discharge.](#)"

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
2. [Remove the front bezel.](#)
3. [Remove the cover.](#)
4. Disconnect the AC power cable and all peripheral cables from the back panel of the system.
5. Release the clip securing the heat sink to the microprocessor socket by first inserting a small flat-tip screwdriver into the upper slot at the front of the socket to release the clamp, and then releasing the clip from the opposite side of the socket.
6. Grasp the end of the ZIF socket arm and bend it out slightly until it disengages from the socket tab.
7. Swing the ZIF arm up to the upright position.

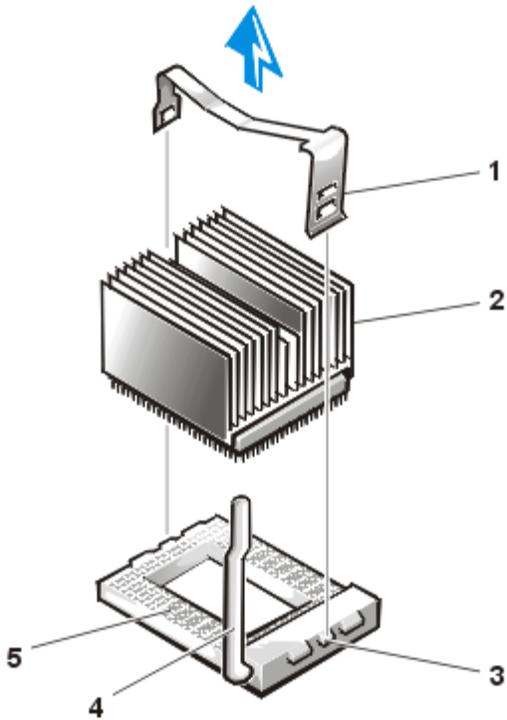
The microprocessor and heat-sink assembly are now unlocked from the ZIF socket.

NOTICE: The microprocessor may adhere to the heat-sink assembly because of a layer of thermal grease applied to the top of the microprocessor. When lifting the heat sink away, use care to prevent the microprocessor from separating from the heat sink and falling on system board components.

8. Lift the microprocessor and heat-sink assembly away from the ZIF socket (see Figure 19).

Figure 19. Microprocessor and Heat Sink Removal

- 1 Heat-sink clip
- 2 Microprocessor and heat-sink assembly
- 3 Tab on ZIF socket (2)
- 4 ZIF socket release lever
- 5 ZIF socket



Microprocessor and Heat-Sink Assembly Replacement

To install the replacement microprocessor and heat-sink assembly, see [Figure 19](#) and perform the following steps:

1. [Remove the microprocessor and heat sink assembly.](#)
2. Gently place the replacement microprocessor into the ZIF socket so that the processor pins mate exactly with the ZIF socket.

Make certain that pin 1 of the microprocessor is oriented correctly in the socket.

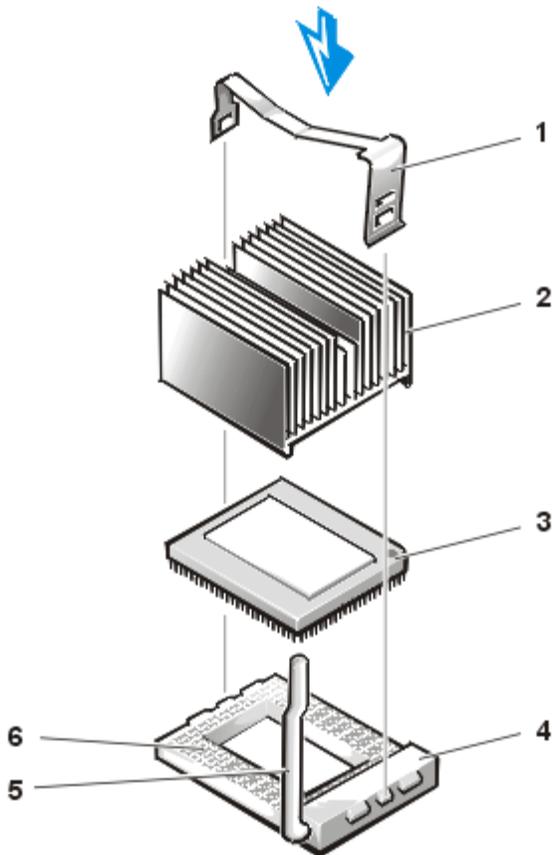


CAUTION: Do not force the processor into the socket. Even slight pressure can bend the microprocessor pins.

3. With the microprocessor in place, swing the ZIF socket arm down until it snaps into the socket tab (see Figure 20).

Figure 20. Microprocessor and Heat-Sink Replacement

- 1 Heat-sink clip
- 2 Heat-sink assembly
- 3 Microprocessor
- 4 Tab on ZIF socket (2)
- 5 ZIF socket release lever
- 6 ZIF socket



4. At the base of the heat-sink, remove and discard any protective cover that may be over the thermal grease by pulling on the cover's tab.
5. Carefully place the heat-sink on the microprocessor.

Be careful not to touch the surfaces coated with thermal grease. The beveled surface on the heat-sink covers the part of the ZIF socket that is not covered by the microprocessor.

6. Drop the heat-sink clip into the heat sink's center groove, with the end of the clip that has two slots facing the front of the ZIF socket.
7. Gently hold the heat-sink in place as you press down on the end of the shorter end of the heat-sink clip (the end that has a single slot) until that end snaps into its tab on the back of the ZIF socket.
8. Use your thumb to press down on the front end of the heat-sink clip (the end that has two slots) until it snaps into the socket tab.
9. Replace the [cover](#), install the power cord, and turn on the system's power switch.

Battery

The system battery maintains configuration, date, and time information in a special section of memory when you turn off the system. The operating life of the battery ranges from 2 to 5 years, depending on how you use the system (for example, if you keep the system on most of the time, the battery gets little use and thus lasts longer). You may need to replace the battery if an incorrect time or date is displayed during the boot routine along with the following or similar message:

Time-of-day not set -- please run SETUP program

Strike the F1 key to continue, F2 to run the setup utility

or

System CMOS checksum bad -- Run SETUP

Strike the F1 key to continue, F2 to run the setup utility

or

Invalid configuration information -- please run SETUP program

Strike the F1 key to continue, F2 to run the setup utility

To determine if the battery needs replacing, reenter the time and date through the [System Setup program](#). Turn off the system for a few hours, and then turn it on again. Enter the System Setup program. If the date and time are not correct in the System Setup program, replace the battery.



NOTES: Some software may cause the system time to speed up or slow down. If the system seems to operate normally except for the time kept in the System Setup program, the problem may be caused by software rather than by a defective battery.

If the system is turned off for long periods of time (for weeks or months), the NVRAM may lose its system configuration information. This situation is not caused by a defective battery.

You can operate the system without a battery; however, the system configuration information maintained by the battery in NVRAM is erased each time you shut down the system. Therefore, you must reenter the system configuration information and reset the options each time the system boots until you replace the battery.

The battery is a 3.0-volt (V), coin-cell CR2032-type battery. To remove the battery, perform the following steps.



CAUTION: There is a danger of a 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.

1. Enter the System Setup program and, if possible, make a printed copy of the System Setup screens.

See "[Using the System Setup Program](#)" for instructions.

2. Shut down the system, including any attached peripherals, and disconnect the system from the electrical outlet.

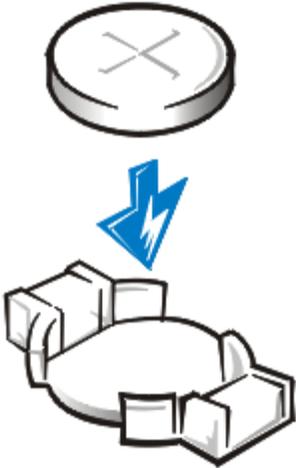
NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

3. [Remove the cover](#).
4. Pry the battery out of its socket with your fingers or with a blunt, nonconductive object such as a

plastic screwdriver.

5. Install the new battery with the side labeled "+" facing up (see [Figure 21](#)).

Figure 21. Battery Replacement



6. [Replace the cover](#), and then reconnect the system and peripherals to their AC power sources and turn them on.
7. Enter the System Setup program to confirm that the battery is operating properly.
8. Enter the correct time and date through the System Setup program's **Time** and **Date** settings. Also reenter any system configuration information that is no longer displayed on the System Setup screens, and then exit the System Setup program.
9. To test the newly installed battery, turn off and disconnect the system from the electrical outlet for at least an hour.
10. After an hour, plug in and turn on the system and enter the System Setup program. If the time and date are still incorrect, see "Getting Help" in your system *Installation and Troubleshooting Guide* for instructions on obtaining technical assistance.

[Back to Contents Page](#)

Jumpers: Dell™ PowerEdge™ 350 Systems Service Manual

[Overview](#)

[Jumpers—A General Explanation](#)

[System Board Jumpers](#)

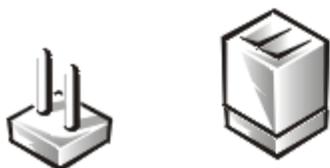
Overview

This section provides specific information about the jumpers on the system board. It also provides some basic information on jumpers and switches and describes the connectors and sockets on the various boards in the system.

Jumpers—A General Explanation

Jumpers provide a convenient and reversible way of reconfiguring the circuitry on a printed circuit board. When installing replacement parts or reconfiguring the system, you may need to change jumper settings on the system board. You may also need to change jumper and/or switch settings on expansion cards or drives.

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



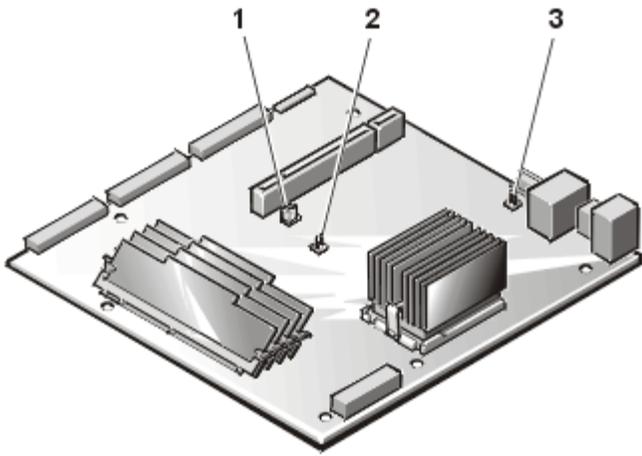
NOTICE: Make sure the system is turned off before you change a jumper setting. Otherwise, damage to the system or unpredictable results may occur.

A jumper is referred to as open or unjumped when the plug is pushed down over only one pin or if there is no plug at all. When the plug is pushed down over two pins, the jumper is referred to as jumped. The jumper setting is often shown in text as two numbers, such as 1-2. The number 1 is printed on the circuit board so that you can identify each pin number based on the location of pin 1.

System Board Jumpers

Figure 1 shows the location of the configuration jumpers on the system board. [Table 1](#) lists the function of these jumpers.

Figure 1. System Board Jumpers



- 2 PASSWORD CLEAR jumper
- 3 Hard-disk drive activity cable connector

Table 1. System Board Jumper Settings

Jumper	Setting	Description
BIOS CONFIG	 1 3 (default)	Normal setting (on pins 1 and 2).
	 1 3 Recovery position (CMOS clear) (on pins 2 and 3)	
PASSWORD CLEAR	  (default)	The password clear feature has cleared the password. The password feature is enabled.
 jumpered  unjumpered		

[Back to Contents Page](#)

Using the System Setup Program: Dell™ PowerEdge™ 350 Systems Service Manual

- [Overview](#)
- [When to Use the System Setup Program](#)
- [Entering the System Setup Program](#)
- [System Setup Screens](#)
- [Using the System Setup Program](#)
- [Main Menu](#)
- [Advanced Menu](#)
- [Security Menu](#)
- [Boot Menu](#)
- [System Management Menu](#)
- [Exit Menu](#)
- [Using the System Password Features](#)
- [Using the Supervisor Password Feature](#)
- [Using the User Password Feature](#)
- [Disabling a Forgotten Password](#)
- [Responding to Error Messages](#)
- [Recovering the BIOS](#)

Overview

This section describes the System Setup program, which is used to change the system configuration information stored in NVRAM on the system board. If the system detects a discrepancy, an error message may appear on the screen that identifies the incorrect configuration settings. The system then prompts you to enter the System Setup program to correct the setting.

When to Use the System Setup Program

You can use the System Setup program as follows:

- To change the system configuration information default settings
- To set or change user-selectable options
- To restore system configuration settings following a service action
- To enable or disable integrated devices in your system

NOTICE: Whenever you add or remove PCI expansion cards that affect system resources (such as ports and interrupt requests (IRQ), you must run the System Setup program, make any necessary changes, and save the system configuration information. Failure to do so may cause resource conflicts between PCI devices (such as the video PCI controller).

After you set up your system, run the System Setup program to familiarize yourself with your system configuration information and optional settings. Dell recommends that you print the System Setup screens (by pressing the <Print Screen> key) or write down the information for future reference.

Entering the System Setup Program



NOTE: You must connect a monitor and keyboard to the PowerEdge 350 system before using the System Setup program.

Enter the System Setup program by performing the following steps:

1. Turn on your system.

If your system is already on, shut it down and then turn it on again.

2. Press <F2> immediately after you see the following message:

Press <F2> to enter Setup

If you wait too long and your operating system begins to load into memory, let the system complete the load operation, and then shut down the system and try again.



NOTE: To ensure an orderly system shutdown, consult the documentation that accompanied your operating system.

You can also enter the System Setup program by responding to certain error messages. See "[Responding to Error Messages.](#)"

System Setup Screens

The System Setup screens display the current setup and configuration information and optional settings for your system. Information on the System Setup screens is organized as shown in Table 1.

Table 1. System Setup Screen Components

Item	Function
Menu bar	Lists the five top-level menus: the Main Menu , the Advanced Menu , the Security Menu , the Boot Menu , the System Management Menu , and the Exit Menu
Configuration options and systems data	Lists System Setup program options, which define the installed hardware in your system
Help	Displays help information
Key functions	Lists keys and their functions within the System Setup program

Using the System Setup Program

Table 2 lists the keys you use to view or change information on the System Setup screens and to exit the program.

Table 2. System Setup Navigation Keys

Keys	Action
<F1>	Displays help for specific categories
<Enter>	Activates submenus, selects options
Left or right arrow	Moves the cursor to the previous or following top-level menu
Up or down arrow	Selects previous or following field in a menu
<F9>	Loads the default option values for all fields
<Esc>	Exits the current option or submenu; if pressed while in a top-level menu, the Exit menu is displayed
<F10>	Exits the System Setup program and reboots the system, implementing any changes you have made

Main Menu

The following tables list each of the options on the System Setup screens for the **Main Menu** and its various submenus.

Table 3. Main Menu Categories

Feature	Default Value	Description
BIOS version		Displays the version of the BIOS
Processor type		Displays the internal operating speed of the microprocessor
Processor serial number	Disabled *	Disables or enables the processor serial number feature
Cache RAM		Displays the amount of Level 2 cache
Total memory		Displays the amount of system memory

Bank 0, Bank 1, Bank 2, Bank 3		Displays the type of memory installed in each bank, if installed
Language	English (US)	Sets the language used by the system BIOS
Memory configuration	ECC	Enables or disables memory error reporting
System time	HH:MM:SS	Sets the system time; to change the time, type numbers in each of the appropriate fields
System date	MM/DD/YYYY	Sets the system date; to change the date, type numbers in each of the appropriate fields

**This option is only available on systems with a Pentium III processor..*

Advanced Menu

NOTICE: Setting fields in these menus to incorrect values may cause the system to malfunction.

Table 4. Advanced Menu Categories

Feature	Description
Boot configuration	Selects the Boot Configuration submenu for system options
Peripheral configuration	Selects the Peripheral Configuration submenu for system I/O port options
IDE configuration	Selects the IDE Configuration submenu for IDE device options
Diskette configuration	Selects the Diskette Configuration submenu for diskette drive options
Event log configuration	Selects the Event Log submenu for system event log options

Boot Configuration Submenu

Table 5. Boot Configuration Submenu Categories

Feature	Default Value	Description
Plug and play O/S	No	If set to No , the BIOS configures all devices in the system; if set to "Yes," the operating system can configure non-boot devices.
Reset config data	No	If set to Yes , the plug and play data is cleared when the system is rebooted
Num Lock	On	Selects the default state of the Num Lock key

Peripheral Configuration Submenu

Table 6. Peripheral Configuration Submenu Categories

Feature	Default Value	Description
Serial Port A	Enabled	Enables serial port 1.
Serial Port B	Enabled	Enables serial port 2.
Legacy USB support	Disabled	Enables or disables support for legacy USB devices

IDE Configuration Menu**Table 7. IDE Configuration Menu Categories**

Feature	Default Value	Description
IDE controller	Both	Disabled disables your system's integrated IDE controller. Primary enables only the primary IDE controller. Both enables both IDE controllers.
Hard-Disk Drive Pre-Delay	Not enabled	If enabled, selects delay interval before the BIOS searches for an IDE hard-disk drive
Primary IDE master Primary IDE slave Secondary IDE master Secondary IDE slave		If one of these devices is detected, the IDE Configuration Submenu (shown later in this section) is displayed

Diskette Configuration**Table 8. Diskette Configuration Submenu Categories**

Feature	Default Value	Description
Diskette controller	Enabled	Enables or disables the diskette controller
Floppy A	1.44/1.25MB 3.5"	Determines the type of diskette drive installed
Diskette write protect	Disabled	Enables or disables diskette write protect

Event Log Configuration**Table 9. IDE Configuration Submenu Categories**

--	--	--

Feature	Default Value	Description
Event log		Displayed if event log is functional
Event log validity		Displayed if event log contents are valid
Clear all event logs	No	If set to Yes , event log is reset on system boot
Event logging	Enabled	Enables logging of critical events
ECC event logging	Enabled	Enables logging of ECC events

Security Menu

The following tables list each of the options on the System Setup screens for the Security Menu and its various submenus.

Table 10. Security Menu Categories

Feature	Default Value	Description
User Password is		Displays the status of the user password option
Supervisor Password is		Displays the status of the supervisor password option
Set User Password		Establishes a new user password up to seven alphanumeric characters long
Set Supervisor Password		Establishes a new supervisor password up to seven alphanumeric characters long
Clear User Password		Clears the current user password (displayed only after the supervisor password is set)
User Access Level	Full	Sets the level of user access to System Setup program

Boot Menu

Table 11. Boot Menu Categories

Feature	Default Value	Description
Quiet boot	Disabled	If set to Disabled , POST messages are displayed. If set to Enabled , a startup screen is displayed
Quick boot	Enabled	If set to Enabled , selected tests are bypassed, speeding up the boot sequence
After power failure	Last State	Determines how the system recovers from a loss of power
On modem ring	Stay Off	If Advanced Power Management is enabled, this option

		determines how the system reacts to a modem signal
On LAN	Power On	If Advanced Power Management is enabled, this option determines how the system reacts to a LAN wake up event
On PME	Stay Off	If Advanced Power Management is enabled, this option determines how the system reacts to a PCI Power Management enabled wake up event
Floppy check	Disabled	If set to Enabled , the system always verifies the diskette drive type during boot. Selecting Disabled results in a faster boot.
IDE drive configuration	Primary Master IDE	Determines the boot search order for IDE devices connected to the system
1st to 8th boot devices	ATAPI CD-ROM	Determines the boot search order for the types of boot devices

System Management Menu

Table 12. System Management Menu Categories

Feature	Default Value	Description
Serial console redirection	Disabled	Enables or disables serial port console redirection
Baud rate	19.2K	Sets the transfer rate for console redirection
Flow control	CTS/RTS	Specifies the type of flow control used

Exit Menu

Table 13. Exit Menu Categories

Feature	Description
Exit Saving Changes	Select this option to exit the System Setup program and save changes.
Exit Discarding Changes	Select this option to exit the System Setup program without saving changes.
Load Setup Defaults	Select this option to reset all System Setup fields to their default values.
Load Custom Defaults	This field saves all current System Setup field values as custom defaults. If the system CMOS fails, the BIOS restores all System Setup values to these custom values, if available. If not, the BIOS uses the factory default values.
Save Custom Defaults	Saves your system's custom settings. This option has no user-configurable settings.
Discard Changes	Select this option to restore all System Setup fields to their previous values.

Using the System Password Feature

NOTICE: The password features provide a basic level of security for the data on your system. However, they are not foolproof. If your data requires more security, it is your responsibility to obtain and use additional forms of protection, such as data encryption programs.

Your Dell system is shipped to you without the system password feature enabled. If system security is a concern, you should operate your system only with system password protection. Two types of passwords can be established—a supervisor password and a user password.

NOTICE: If you leave your system running and unattended without having a system password assigned, or if you leave your system unlocked so that someone can disable the password by changing a jumper setting, anyone can access the data stored on your hard-disk drive.

Using the Supervisor Password Feature

Your Dell system is shipped with the supervisor password feature disabled, which allows you to enter the System Setup program and assign a password. When the **Supervisor Password Is** option is enabled, the system prompts you for the supervisor password whenever you enter the System Setup program. If system security is a concern, you should operate your system with supervisor password protection.

You can assign a supervisor password whenever you use the System Setup program. After a supervisor password is assigned, only those who know the password have full use of the System Setup program. To delete or change an existing supervisor password, you must know the supervisor password (see "[Disabling or Changing an Existing Supervisor Password](#)").

If you assign and then forget a supervisor password, a trained service technician must open the system and change a jumper setting to disable the supervisor password feature (see "[Disabling a Forgotten Password](#)"). Note that the *user password* is erased at the same time.

Assigning a Supervisor Password (System Setup Only)

Before you can assign a supervisor password, you must enter the System Setup program and select the **Set Supervisor Password** option.



NOTE: The supervisor password controls the user password access to the system setup.

When a supervisor password is assigned, the setting shown for the **Set Supervisor Password** option is **Installed**.

When no supervisor password is assigned and the password jumper on the system board is in the uninstalled position (its default), the setting shown for the **Set Supervisor Password** option is **Not Installed**. Only when this option is set to **Not Installed** can you assign a supervisor password, using the following procedure:

1. Enter the System Setup program by pressing <F2>.
2. Select the **Security** screen.
3. Verify that the **Supervisor Password Is** option is set to **Not Installed**.

4. Select the **Set Supervisor Password** option and press <Enter>.

The system prompts you to Enter Supervisor Password.

5. Type your supervisor password.

You can use up to seven characters in your password.

As you press each character key (or the spacebar key for a blank space), an asterisk (*) placeholder appears in the field.

The password assignment operation recognizes keys by their location on the keyboard; it is case sensitive. This means that the software distinguishes between lowercase and uppercase characters. For example, if you have an *M* in your password, the system does not recognize either *M* or *m* as correct; your system will only accept *M*. Certain keys and key combinations are not valid. If you enter one of these keys or combinations, the system does not accept them. To erase a character when entering your password, press <Backspace> or the left-arrow key.



NOTE: To escape from the field without assigning a supervisor password, press the <Esc> key at any time before completing step 5.

6. Press <Enter>.

The system prompts you to Confirm New Password, followed by another empty seven-character field in square brackets.

To confirm your new password, type it a second time and press <Enter>.

The system tells you the Password Successfully Installed.

The password setting changes to **Installed**. Your supervisor password is now set; you can exit the System Setup program and begin using your system. Note, however, that password protection does not take effect until you reboot the system by turning the system off and then on again.

Using Your Supervisor Password to Secure Your System Setup

If the **Supervisor Password Is** option is set to **Installed**, the following prompt appears:

Enter CURRENT Password

After you type the correct supervisor password and press <Enter>, you can log on to the system as you normally would.

If a wrong or incomplete supervisor password is entered, the following message appears:

Enter CURRENT Password

If an incorrect or incomplete supervisor password is entered again, the same message appears.

The third and subsequent times an incorrect or incomplete supervisor password is entered, the system displays the following message:

Invalid Password-System Halted

To reboot the system and either set a new password, press <Ctrl><Alt> or the reset button on the system unit.

The number of unsuccessful attempts made to enter the correct supervisor password can alert you to an unauthorized person attempting to use your system.

Even after your system is turned off and on, the previous message is displayed each time an incorrect or incomplete supervisor password is entered.



NOTE: The supervisor password only applies to the System Setup program. A user password should be installed to completely secure your system. See "[Assigning a Supervisor Password \(System Setup Only\)](#)."

Deleting or Changing an Existing Supervisor Password

To delete or change an existing supervisor password, perform these steps:

1. Enter the System Setup program by pressing <F2>.
2. Select the **Security** screen field to verify that the **Supervisor Password Is** option is set to **Installed**.
3. Select the **Set Supervisor Password** option and press <Enter>.

The system prompts you to Enter Current Password.

4. Type your current supervisor password and press <Enter>

The system prompts you to Enter Supervisor Password.



*NOTE: If you want to delete the password and not enter a new password, press <Enter> without typing in a new password, leaving the **Enter Supervisor Password** field blank.*

5. To assign a new password follow the procedure from step 4 in "[Assigning a Supervisor Password \(System Setup Only\)](#)."

Using the User Password Feature

Your system is shipped to you with the user password feature disabled. After you assign a user password, the system prompts you for the user password during the boot process. If system security is a concern, you should operate your system with user password protection.

You can assign a user password, as described in "[Assigning a User Password](#)," whenever you use the System Setup program. After you assign a user password, only those who know the password have full use of the system.

If you assign and then *forget* a user password, you must remove the system cover and change a jumper setting to temporarily disable the user password feature (see "[Disabling a Forgotten Password](#)"). Note that the *supervisor password* is erased at the same time.

NOTICE: If you leave your system running and unattended without having a system password assigned, or if you leave your system unlocked so that someone can disable the password by changing a jumper setting, anyone can access the data stored on your hard-disk drive.

Assigning a User Password

Before you can assign a user password, you must enter the System Setup program and select the **Set User Password** option.

To assign a user password, perform the following steps:

1. Enter the System Setup program by pressing <F2>.
2. Select the **Security** screen.
3. Select the **Set User Password** option and press <Enter>.

The system prompts you to Enter User Password.

4. Type your user password.

You can use up to seven characters in your password.

As you press each character key (or the spacebar key for a blank space), an asterisk (*) placeholder appears in the field.

The password assignment operation recognizes keys by their location on the keyboard; it is case sensitive. This means that the software distinguishes between lowercase and uppercase characters. For example, if you have an *M* in your password, the system does not recognize either *M* or *m* as correct; your system will only accept *M*. Certain keys and key combinations are not valid. If you enter one of these keys or combinations, the system does not accept them. To erase a character when entering your password, press <Backspace> or the left-arrow key.

 **NOTE:** To escape from the field without assigning a user password, press <Esc> at any time prior to completing step 4.

5. Press <Enter>.

The system prompts you to Confirm New Password, followed by another empty seven-character field in square brackets.

6. To confirm your password, type it a second time and press <Enter>.

The system tells you that the Password Successfully Installed.

The password setting changes to **Installed**. Your supervisor password is now set; you can exit the System Setup program and begin using your system. A change to the **Set User Password** option becomes effective immediately (rebooting the system is not required).

 **NOTES:** The user password can be the same as the supervisor password.

If the two passwords are different, the user password can be used as an alternate supervisor

password. However, the supervisor password cannot be used in place of the user password.

Operating With a User Password Installed

If **Set User Password** is set to **Installed**, you must enter the correct user password before you can modify the majority of the System Setup options. When you start the System Setup program, the program prompts you to type the password.

If you do not enter the correct password in three tries, the system displays the following message:

Invalid Password-System Halted

Deleting or Changing an Existing User Password

To delete or change an existing user password, perform the following steps:

1. Enter the System Setup program by pressing <F2>.
2. Select the **Security** screen field to verify that the **User Password Is** option is set to **Installed**.
3. Select the **Set User Password** option and press <Enter>.

The system prompts you to Enter Current Password.

4. Type your current user password and press <Enter>

The system prompts you to Enter User Password.



*NOTE: If you want to delete the password and not enter a new password, press <Enter> without typing in a new password, leaving the **Enter User Password** field blank.*

5. To assign a new password, follow the procedure from step 4 in "[Assigning a User Password \(System Setup Only\)](#)."

Disabling a Forgotten Password

If the administrator or user forgets the supervisor or user password, you cannot operate the system or change settings in the System Setup program until a trained service technician opens the system chassis, changes the password jumper setting to disable the passwords, and erases the existing passwords.

To disable a forgotten supervisor password or user password, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

1. Shut down and power off your system and disconnect the system and peripherals from their electrical outlets.
2. Remove the [system cover](#).

3. Refer to "[System Board Jumpers](#)" for the location of the password jumper (labeled "PASSWORD CLEAR") on the system board.
4. Remove the jumper plug from the PASSWORD CLEAR jumper.
5. [Replace the system cover](#) and then reconnect the system to an electrical outlet and turn it on.

The system password is cleared. Do not set a new system password at this time.



NOTE: If you assign a new supervisor and/or user password with the jumper plug still in place, the system disables the new password(s) the next time it boots.

6. Repeat steps 1 through 3.
7. Remove the jumper plug from the PASSWORD CLEAR jumper.
8. Replace the [system cover](#) and then reconnect the system to an electrical outlet and turn it on.
9. Assign a new supervisor and/or user password.

To assign a new supervisor password using the System Setup program, see "[Assigning a Supervisor Password](#)." To assign a new user password using the System Setup program, see "[Assigning a User Password](#)."

Responding to Error Messages

If an error message appears on your monitor screen while the system is booting, make a note of the message. Before entering the System Setup program, refer to "POST Beep Codes" and "System Messages" in "[Messages and Codes](#)" for an explanation of the message and suggestions for correcting errors.

Recovering the BIOS

If the system BIOS is corrupted, you can reboot the system by using a separate recovery BIOS. To recover the BIOS, perform the following steps:

1. Shut down the system.
2. Change the BIOS CONFIG jumper to the recovery position (place the jumper on pins 2-3).
3. Place the BIOS recovery diskette in the diskette drive and restart the system.
4. Power down the system and unplug the ac power cable.
5. The recovery BIOS recovery diskette boots the system and reflashes the system BIOS. This procedure takes up to five minutes. If the procedure completes successfully, the system beeps twice.
6. Shut down the system and remove the BIOS recovery diskette.

7. Have a trained service technician return the BIOS CONFIG jumper to the normal position.

[Back to Contents Page](#)