

Dell™ PowerEdge™ 350 Systems

INSTALLATION AND TROUBLESHOOTING GUIDE

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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.



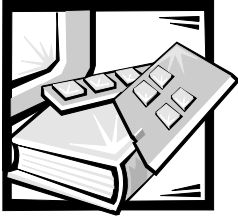
WARNING: A WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious bodily injury.

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Preface

This guide is intended for anyone who wants to upgrade or troubleshoot a Dell PowerEdge 350 system. Before calling Dell for technical assistance, follow the recommended procedure(s) in this guide to solve most hardware and software problems yourself.

- Chapter 1, “Introduction” — Overview of the system's service features.
- Chapter 2, “Checking the Basics”— Initial checks and procedures used to solve basic system problems and information on more detailed troubleshooting procedures to solve more complex problems.
- Chapter 3, “Messages and Codes” — System messages, POST beep codes, diagnostics messages, and alert log messages.
- Chapter 4, “Finding Software Solutions” — Software-related problems or problems after testing the system's hardware.
- Chapter 5, “Running the Dell Diagnostics” — Hardware-related problems.
- Chapter 6, “Checking the Equipment,” and Chapter 7, “Checking Inside the System” — Troubleshooting procedures for equipment connected to the input/output (I/O) panel of the system and components inside the system, respectively. “Checking Inside the System” also provides information on removing the system cover.
- Chapter 8, “Installing System Board Options”— Installation or removal of system components, such as memory modules, microprocessors, and expansion cards.
- Chapter 9, “Installing Drives” — Installation or removal of hard-disk drives, CD-ROM drive, and diskette drive.
- Chapter 10, “Getting Help” — Help tools Dell provides to assist with system problems and explanations on how and when to call Dell for technical assistance.
- Appendix A, “Jumpers and Connectors” — Jumper settings to change when troubleshooting the system or adding internal options.
- “Abbreviations and Acronyms”— Abbreviations and acronyms used throughout this guide and in other Dell documentation for the system.

Other Documents You May Need

In addition to this *Installation and Troubleshooting Guide*, you may need the *Dell PowerEdge 350 Systems User's Guide*, which describes system features and technical specifications, and explains how to use the System Setup program.

You may also have one or more of the following documents.



NOTE: Documentation updates are sometimes included with the system to describe changes to the system or software. Always read these updates before consulting any other documentation because the updates often contain information that supersedes the information in the other documents.

- Your *Dell PowerEdge System Information* document contains important safety, regulatory, and warranty information.
- The *Rack Installation Guide* provides detailed instructions for installing the system in a rack.
- Operating system documentation is included with the system if you ordered the operating system software from Dell. This documentation describes how to install (if necessary), configure, and use the operating system software.
- Documentation is included with any options you purchase separately from the system. This documentation includes information that you need to configure and install these options in your Dell system.
- The Dell OpenManage software documentation, which describes the features, requirements, installation, and basic operation of this optional server management software.
- Technical information files—sometimes called “readme” files—may be installed on the hard-disk drive to provide last-minute updates about technical changes to the system or advanced technical reference material intended for experienced users or technicians.

Typographical Conventions

The following list defines (where appropriate) and illustrates typographical conventions used as visual cues for specific elements of text throughout this document:

- *Interface components* are window titles, button and icon names, menu names and selections, and other options that appear on the monitor screen or display. They are presented in bold.
Example: Click **OK**.
- *Keycaps* are labels that appear on the keys on a keyboard. They are enclosed in angle brackets.
Example: <Enter>

- *Key combinations* are series of keys to be pressed simultaneously (unless otherwise indicated) to perform a single function.
Example: <Ctrl><Alt><Enter>
 - *Commands* presented in lowercase bold are for reference purposes only and are not intended to be typed when referenced.
Example: "Use the **format** command to . . ."
- In contrast, commands presented in the Courier New font are part of an instruction and intended to be typed.
- Example: "Type `format a:` to format the diskette in drive A."
- *Filenames* and *directory names* are presented in lowercase bold.
Examples: **autoexec.bat** and **c:\windows**
 - *Syntax lines* consist of a command and all its possible parameters. Commands are presented in lowercase bold; variable parameters (those for which you substitute a value) are presented in lowercase italics; constant parameters are presented in lowercase bold. The brackets indicate items that are optional.
Example: **del** [*drive:*] [*path*] *filename* [**/p**]
 - *Command lines* consist of a command and may include one or more of the command's possible parameters. Command lines are presented in the Courier New font.
Example: `del c:\myfile.doc`
 - *Screen text* is a message or text that you are instructed to type as part of a command (referred to as a *command line*). Screen text is presented in the Courier New font.
Example: The following message appears on your screen:

`No boot device available`
Example: "Type `md c:\programs` and press <Enter>."
 - *Variables* are placeholders for which you substitute a value. They are presented in italics.
Example: DIMM_x (where x represents the DIMM socket designation).



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Abbreviations and Acronyms

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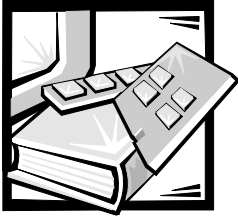
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CHAPTER 1

Introduction

The Dell™ PowerEdge™ 350 system is an ultra-slim, rack-mounted server that provides a robust, reliable, rack-optimized platform on which both large and small customers can deploy Internet infrastructure applications. The system includes the following service features to make troubleshooting and repair easy and effective:

- Dell Diagnostics, which checks for hardware problems (if the system can boot)
- Embedded server management hardware, which monitors temperatures and voltages throughout the system and notifies you if the system overheats, if a system cooling fan malfunctions, or if a power supply fails

The system chassis simplifies removing and replacing system components. You can perform microprocessor and memory upgrades without removing the system board.

The following upgrade options are offered for your system:

- Additional memory
- A variety of expansion card options
- Microprocessors



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

Safety, Regulatory, and Warranty Information

For important safety, regulatory, and warranty information, see the *Dell PowerEdge System Information* document that came with your system.



CHAPTER 2

Checking the Basics

This chapter guides you through some initial checks and procedures that can solve basic system problems. It can also direct you to the appropriate chapter for detailed troubleshooting information and procedures to solve more complex problems. If your system is not working as expected, begin troubleshooting using the procedures in this chapter.

Before you start any of the procedures in this chapter, read “Safety First—For You and Your System,” in Chapter 7.

You need your system’s *User’s Guide* to perform the procedures in this chapter.



NOTE: When you see the question “Is the problem resolved?” in a troubleshooting procedure, perform the operation that caused the problem.

Backing Up Files

If the system is behaving erratically, back up the files on the hard-disk drives immediately. See the documentation that came with the operating system for instructions on how to back up the files.

Basic Checks

The following procedure leads you through the checks necessary to solve some basic system problems:

1. Perform the steps in the next section, “Checking Connectors and Switches.”

Is the problem resolved?

Yes. The power to the system was faulty, or the connections to the system were loose. You have fixed the problem.

No. Go to step 2.

2. If a keyboard and monitor are not connected to the system, shut down the system, connect a monitor and keyboard, and restart the system.

Did you receive a system message or beep code?

Yes. See Chapter 3, "Messages and Codes."

No. Go to step 3.

3. Did the system complete the boot routine?

Yes. Go to step 4.

No. A serious malfunction may have occurred. See Chapter 10, "Getting Help," for information on additional resources Dell provides to help you when you have a problem with your system.

4. Run the Dell Diagnostics. See Chapter 5, "Running the Dell Diagnostics."

If you need additional assistance, see Chapter 10, "Getting Help," for information on additional resources Dell provides to help you when you have a problem with your system.

Checking Connectors and Switches

Loose or improperly connected cables are the most likely sources of problems for your system. A check of all the cable connections can solve these problems.

Figure 2-1 shows the system's back-panel connectors.

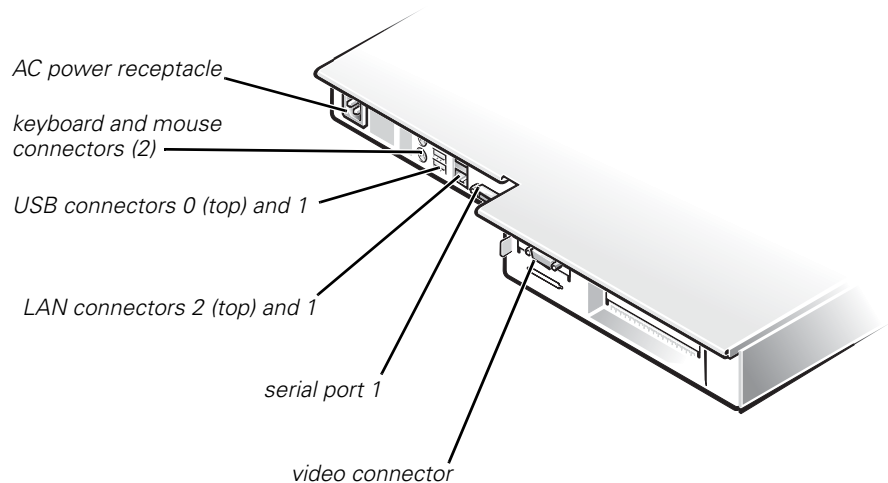


Figure 2-1. Back-Panel Connectors

To check the external connections to your system, perform the following steps:

1. If the system is connected to a power strip (or power distribution unit), switch the power strip off and then on again.

Is the power strip receiving power?

Yes. Go to step 4.

No. Go to step 2.

2. Plug the power strip into a different electrical outlet.

Is the power strip receiving power?

Yes. The original electrical outlet probably does not function. Use a different electrical outlet.

No. Go to step 3.

3. Plug a different device into the electrical outlet.

Does the device receive power?

Yes. The power strip is probably not functioning properly. Use another power strip.

No. Locate a working electrical outlet. Go to step 4.

4. Reconnect the system to the electrical outlet or power strip.

Make sure that all connections fit tightly together.

5. Power on the system.

Is the problem resolved?

Yes. The connections were loose or there was a problem with the electrical outlet or power strip. You have fixed the problem.

No. Go to step 6.

6. Power off the system and all attached devices. Disconnect all the AC power cables from their electrical outlets.

7. Reseat all power cables connected to the system, peripheral devices, and electrical outlets.

8. Reseat the keyboard and mouse interface cable connectors, if present, in the proper connectors on the back of the system (see Figure 2-1).

9. Reconnect the video-interface cable connectors, if present, to the video connector on the back of the system (see Figure 2-1) and to the connector on the back of the monitor.

NOTE: On some monitors, the video interface cable is permanently attached.



10. Check the network connections as instructed in “Troubleshooting the Integrated NICs” in Chapter 6.
11. Power on the system and all attached devices.

Is the problem resolved?

Yes. You have fixed the problem.

No. See Chapter 10, “Getting Help,” for information on additional resources Dell provides to help you when you have a problem with your system.
12. Is the monitor operating properly?

Yes. Go to step 14.

No. Go to “Troubleshooting the Monitor” in Chapter 6, “Checking the Equipment.”
13. Is the keyboard operating properly?

Yes. Go to step 15.

No. Go to “Troubleshooting the Keyboard” in Chapter 6, “Checking the Equipment.”
14. Is the mouse operating properly?

Yes. Continue with “Look and Listen,” the next section in this chapter.

No. Go to “Troubleshooting the Basic I/O Functions” in Chapter 6, “Checking the Equipment.”

Look and Listen

The front panel of your system contains switches, indicator lights, and diskette and CD-ROM drives. To view the front panel, you must remove the optional front bezel from the system.

Removing the Optional Front Bezel

To remove the front bezel, press the retention tab on each end of the bezel and remove the bezel from the chassis (see Figure 2-2).

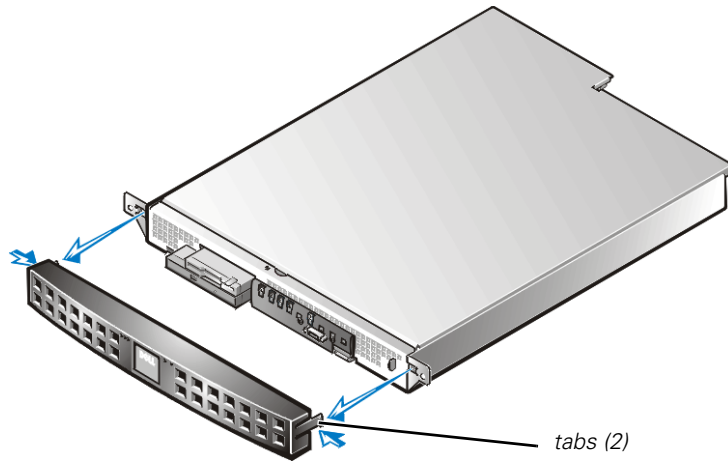


Figure 2-2. Removing the Optional Front Bezel

Figure 2-3 shows the main features on the system front panel, and Figure 2-4 shows the front-panel indicators. For a description of these indicators, see Table 2-1.

Figure 2-6 shows the location of the three switches on the system front panel, and Table 2-2 describes the function of these switches.

Front-Panel Features

Figure 2-3 shows the main features on the system front panel.

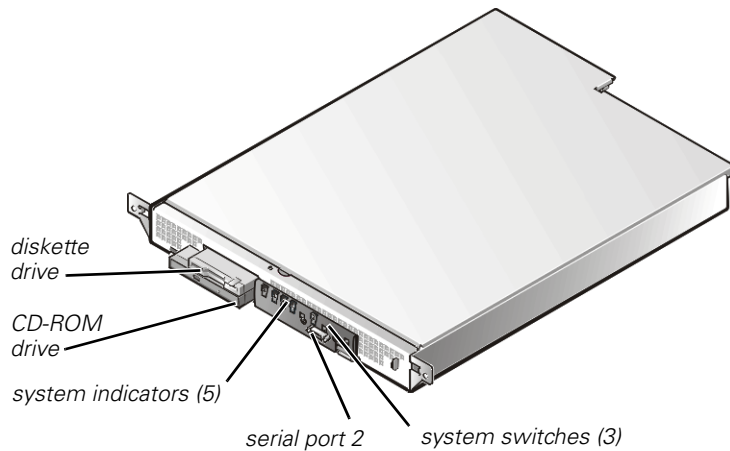


Figure 2-3. Front-Panel Features

System Indicators

While troubleshooting your system, you might need to check the status of the indicators on the system's front panel, shown in Figure 2-4 and Figure 2-5.

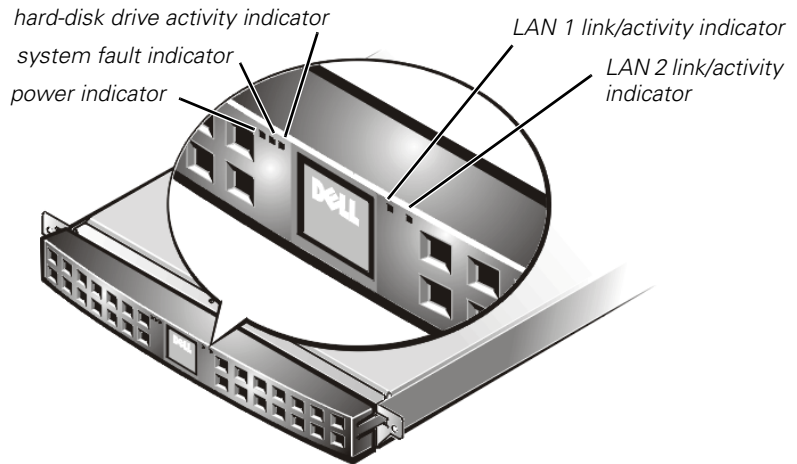


Figure 2-4. Front-Panel Indicators

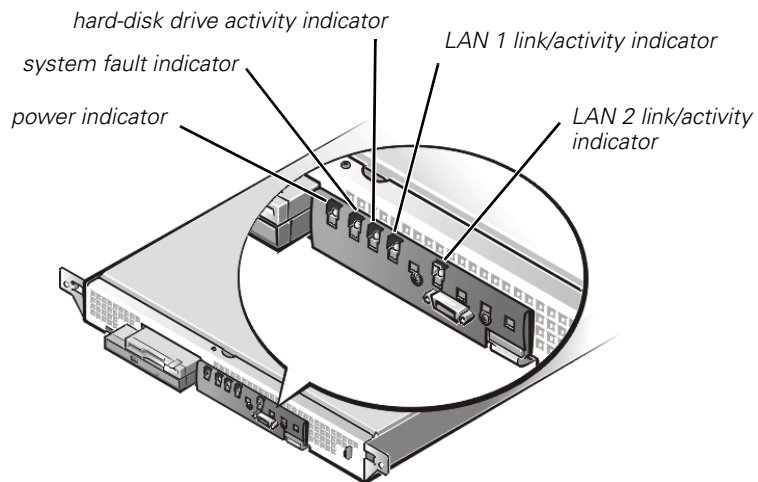


Figure 2-5. Front-Panel Indicators (Bezel Removed)

Table 2-1 describes the appearance and function of the front-panel indicators.

Table 2-1. Front-Panel Indicators

Indicator	Color	Function
Power	Green	Lights up when the system is connected to an AC power source; blinks when the system is in sleep mode
System fault	Amber	Blinks during system startup, or when a system fault is detected
Hard-disk drive activity	Green	Blinks when hard-disk drive activity occurs
LAN 1 link/activity	Amber	Lights up when the LAN 1 connector is linked to an Ethernet port; blinks when activity occurs on this channel.
LAN 2 link/activity	Amber	Lights up when the LAN 2 connector is linked to an Ethernet port; blinks when activity occurs on this channel.

System Switches

Figure 2-6 shows the location of the three switches on the system front panel. To activate a switch, press the corresponding icon on the front panel as shown in Figure 2-6.

NOTICE: To prevent accidental system lockup, system reset, or false error messages, do not press areas of the front panel other than the three switch locations shown in Figure 2-6. Reserved test switches are located in other areas of the front panel.

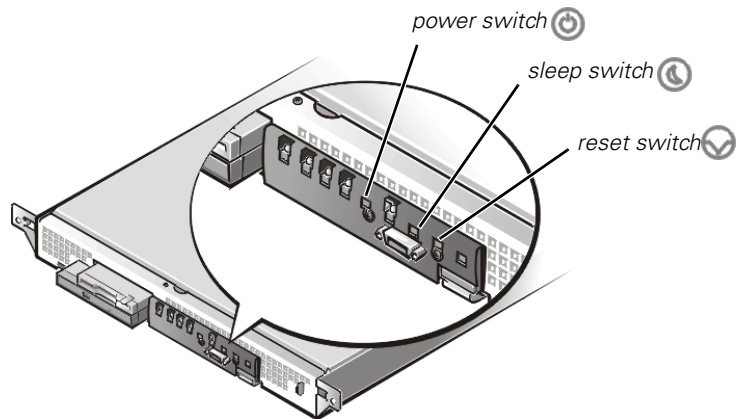


Figure 2-6. Front-Panel Switches

Table 2-2 describes the function of the three front-panel switches.

Table 2-2. Front-Panel Switches

Switch	Function
Power switch	Powers the system on or off. <i>NOTE: To power off the system, press and hold this switch for at least 4 seconds.</i>
Sleep switch	Places the system in sleep mode.
Reset switch	Reboots the system. If the system locks up and you cannot shut down the system normally, press the reset switch.

System Setup Program



NOTE: You must connect a keyboard and monitor to perform this procedure.

You can easily correct certain system problems by verifying the correct settings in the System Setup program. When you boot the system, the system checks the system configuration information and compares it with the current hardware configuration. If the system hardware configuration does not match the information recorded by the System Setup program, an error message may appear on the screen.

This problem can happen if you changed the system's hardware configuration and forgot to run the System Setup program. To correct this problem, enter the System Setup program, correct the corresponding System Setup setting, and reboot the system. See "Using the System Setup Program," in the *User's Guide* for detailed instructions on using the System Setup program.



CHAPTER 3

Messages and Codes

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 chapter documents the diagnostic and beep codes and system messages generated by the system basic input/output system (BIOS).

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 3-1 lists possible system messages.



NOTE: If you receive a system message that is not listed in Table 3-1, check the software documentation provided with your system for a possible explanation of the message and recommended action.

Table 3-1. System Messages

Message	Cause	Corrective Action
8042 Gate A20 Error	Faulty keyboard controller (defective system board)	Replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
Address Line Short!	Faulty memory circuitry on system board	Replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
C: Drive Error	Hard-disk drive is not responding correctly to system commands	Run the Dell Diagnostics. See Chapter 5, "Running the Dell Diagnostics," for instructions. Replace the hard-disk drive. See Chapter 9, "Installing Drives," for more information.
C: Drive Failure	Faulty hard-disk drive	Replace the hard-disk drive. See Chapter 9, "Installing Drives," for more information.

NOTE: For the full name of an abbreviation or acronym used in this table, see "Abbreviations and Acronyms."

Table 3-1. System Messages (continued)

Message	Cause	Corrective Action
Cache Memory Bad, Do Not Enable Cache!	Faulty cache memory	Replace the microprocessor. See Chapter 8, "Installing System Board Options," for more information.
CH-2 Timer Error	Faulty system board	Replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
CMOS Battery State Low	The system battery power is low	Replace the system battery. See Chapter 8, "Installing System Board Options," for more information.
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," in the <i>User's Guide</i> for instructions.
CMOS Memory Size Mismatch	System memory value in System Setup program is incorrect	Correct the System Setup program video configuration settings. See "Using the System Setup Program," in the <i>User's Guide</i> for instructions.
CMOS System Options Not Set	Missing settings in System Setup program	Check the System Setup program configuration settings. See "Using the System Setup Program," in the <i>User's Guide</i> for instructions.
CMOS Time and Date Not Set	Defective system battery	Replace the system battery. See Chapter 8, "Installing System Board Options," for more information.
D: Drive Error	Hard-disk drive is not responding correctly to system commands	Run the Dell Diagnostics. See Chapter 5, "Running the Dell Diagnostics," for instructions. Replace the hard-disk drive. See Chapter 9, "Installing Drives," for more information.
D: Drive Failure	Faulty hard-disk drive	Replace the hard-disk drive. See Chapter 9, "Installing Drives," for more information.
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. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
FDD Controller Failure	Faulty diskette/tape drive controller (defective system board)	Replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

NOTE: For the full name of an abbreviation or acronym used in this table, see "Abbreviations and Acronyms."

Table 3-1. System Messages (continued)

Message	Cause	Corrective Action
HDD Controller failure	Loose cable, improperly connected hard-disk drive, or faulty IDE controller	Check the hard-disk drive cable connections. If the problem persists, replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
INTR1 Error INTR2 Error	Faulty system board	Replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
Invalid Boot Diskette	No operating system on diskette	Use a bootable diskette.
KB/Interface error	Keyboard cable connector loose or improperly connected, defective keyboard, or defective keyboard/mouse controller (defective system board)	Check the keyboard cable connection (See Figure 2-1). Replace the keyboard. If the problem persists, replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
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	Faulty DIMMs or defective system board	Replace DIMMs. See Chapter 8, "Installing System Board Options," for more information.
On Board Parity Error Addr = xxxx	Faulty DIMMs or defective system board	Replace DIMMs. See Chapter 8, "Installing System Board Options," for more information.
Parity Error ????	Faulty DIMMs or defective system board	Replace DIMMs. See Chapter 8, "Installing System Board Options," for more information.

NOTE: For the full name of an abbreviation or acronym used in this table, see "Abbreviations and Acronyms."

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.

Table 3-2. 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. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
2	Parity error; faulty DIMMs or defective system board	Replace the DIMMs or system board. See Chapter 8, "Installing System Board Options," for more information.
3	Base 128 KB memory failure	Replace the first DIMM or system board. See Chapter 8, "Installing System Board Options," for more information.
4	Timer not operational	Replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
5	Processor error	Replace the microprocessor. See Chapter 8, "Installing System Board Options," for more information.
6	8042 - Gate A20 failure	Replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
7	Processor exception interrupt error	Replace the microprocessor. See Chapter 8, "Installing System Board Options," for more information.
8	Display memory read-write error	Unless your system is connected to monitor, no action is required. If a monitor is connected, the video adapter is faulty. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
9	ROM checksum error	This error usually requires that you replace the BIOS firmware. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
10	CMOS shutdown register read/write error	Replace the system board. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.
11	Cache memory bad	The cache memory test has failed. See Chapter 8, "Installing System Board Options," for more information.

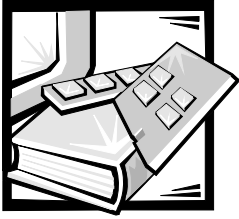
NOTE: For the full name of an abbreviation or acronym used in this table, see "Abbreviations and Acronyms."

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 in Chapter 10, "Getting Help," and then follow the instructions in that section for obtaining technical assistance.

Alert Log Messages From the Dell OpenManage Server Agent

The optional Dell OpenManage Server Agent management application program generates alert messages that are written to the Simple Network Management Protocol (SNMP) trap log file. See your Dell OpenManage Server Agent documentation for more information.



CHAPTER 4

Finding Software Solutions

Because most systems have several application programs installed in addition to the operating system, isolating a software problem sometimes is confusing. Software errors can look like hardware malfunctions at first.

Software problems can result from the following circumstances:

- Improper installation or configuration of a program
- Input errors
- Device drivers that conflict with certain application programs
- Interrupt conflicts between devices

You can confirm that a system problem is caused by software by running the system board tests in the Dell Diagnostics (see Chapter 5, “Running the Dell Diagnostics”). If all tests in the test group are completed successfully, the problem is most likely caused by software.

This chapter provides some general guidelines for analyzing software problems. For detailed troubleshooting information on a particular program, see the documentation that accompanied the software or consult the support service for the software.

Installing and Configuring Software

Use virus-scanning software to check newly acquired application programs and files for viruses before you install the programs on the system's hard-disk drive. Viruses can quickly use all available system memory, damage and/or destroy data stored on the hard-disk drive, and permanently affect the performance of the programs they infect. Several commercial virus-scanning programs are available for purchase.

Before you install a program, read its documentation to learn how the program works, what hardware it requires, and what its defaults are. A program usually includes installation instructions in its accompanying documentation and a software installation routine.

The software installation routine assists you in transferring the appropriate program files to the system's hard-disk drive. Installation instructions often provide details about how to configure the operating system to successfully run the program. Always read the installation instructions before running a program's installation routine.

When you run the installation routine, be prepared to respond to prompts for information about how the system's operating system is configured, what type of system you have, and what peripheral devices are connected to the system.

Using Software

The following subsections discuss errors that can occur as a result of software operation or configuration.

Error Messages

Error messages are produced by the system, an application program, or the operating system. Chapter 3, "Messages and Codes," provides information about the error messages that are generated by the system. If you receive an error message that is not listed in Chapter 3, "Messages and Codes," check the operating system or application program documentation.

Input Errors

If you press a specific key or set of keys at the wrong time, a program might give you unexpected results. See the documentation that came with the application program to make sure that the values or characters you are entering are valid.

Make sure that the operating environment is set up to accommodate the programs you use. Keep in mind that whenever you change the parameters of the system's operating environment, you can affect the successful operation of the programs. Sometimes, after modifying the operating environment, you will need to reinstall a program that no longer runs properly.

Program Conflicts

Some programs leave portions of their setup information behind, even though you have exited from them. As a result, other programs cannot run. Rebooting the system can confirm whether these programs are the cause of the problem.

Device drivers, which are programs that use specialized subroutines, can cause problems with the system. For example, a variation in the way the data is sent to the monitor can require a special screen driver program that expects a certain kind of video mode or monitor. In such cases, you can develop an alternate method of running that particular program—by creating a start-up file made especially for that program, for example. Call the support service for the software you are using to help you with this problem.

Avoiding Interrupt Assignment Conflicts

Problems can arise if two devices attempt to use the same interrupt request (IRQ) line. To avoid this type of conflict, check the peripheral component interconnect (PCI) IRQ assignment screen in the System Setup program (see the *User's Guide* for instructions). Consult Table 4-1 to configure the card for one of the available IRQ lines.

Table 4-1. IRQ Line Assignment Defaults

IRQ Line	Used By/Available
IRQ0	Used by the system timer
IRQ1	Used by the keyboard to signal that the output buffer is full
IRQ2	Used by interrupt controller 2
IRQ3	COM2
IRQ4	Used by serial port 1 (COM1 and COM3) or peripheral component interconnect (PCI) device
IRQ5	Available
IRQ6	Used by the diskette drive controller
IRQ7	Available
IRQ8	Used by the real-time clock (RTC)
IRQ9	Reserved for advanced configuration and power interface (ACPI)
IRQ10	Available
IRQ11	Available
IRQ12	Used by the Personal System/2 (PS/2) mouse port, unless the mouse is disabled in the System Setup program
IRQ13	Reserved for floating-point errors
IRQ14	Used by the hard-disk drive
IRQ15	Available

NOTE: For the full name of an abbreviation or acronym used in this table, see "Abbreviations and Acronyms."



CHAPTER 5

Running the Dell Diagnostics

Unlike many diagnostic programs, the Dell Diagnostics help you check the system's hardware without any additional equipment and without destroying any data. By using the diagnostics, you can have confidence in the system's operation. If you find a problem that you cannot solve by yourself, the diagnostic tests can provide you with important information you will need when talking to Dell's technical assistance representative.

NOTICE: Use the Dell Diagnostics to test only Dell systems. If you use this program with other systems, incorrect system responses or error messages might result.



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

Features of the Dell Diagnostics

The Dell Diagnostics provide a series of menus and options from which you choose particular device groups or devices. You can also control the sequence in which the tests are run. The diagnostic menus also have these helpful features:

- Options that let you run tests individually or collectively
- An option that allows you to choose the number of times a test is repeated
- The ability to display or print test results or to save them in a file
- Options to temporarily suspend testing if an error is detected or to terminate testing when an adjustable error limit is reached
- Help messages that briefly describe each test and its parameters
- Status messages that inform you whether device group or device tests are completed successfully
- Error messages that appear if any problems are detected

When to Use the Dell Diagnostics

Whenever a major component or device in the system does not function properly, you might have a component failure. As long as the microprocessor and the input and output components of the system (the monitor, keyboard, and diskette drive) are working, you can use the Dell Diagnostics. If you know what component(s) you need to test, simply select the appropriate diagnostic device group(s) or subtest(s). If you are unsure about the scope of the problem, read the rest of the information in this section.

Starting 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:

1. 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.

2. 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**.

Selecting **Exit to MS-DOS** exits the diagnostics and returns you to your operating system environment.

To select an option from the **Diagnostics** menu, highlight the option and press <Enter>, or press the key that corresponds to the highlighted letter in the option you choose.

How to Use the Dell Diagnostics

When you select **Advanced Testing** from the **Diagnostics** menu, the main screen of the diagnostics appears.

Information on the main screen of the diagnostics is presented in the following areas:

- Two lines at the top of the main screen identify the diagnostics and give its version number.
- On the left side of the screen, the **Device Groups** area lists the diagnostic device groups in the order they will run if you select **All** under the **Run Tests** submenu. Press the up- or down-arrow key to highlight a device group.
- On the right side of the screen, the **Devices for Highlighted Group** area lists the specific devices within a particular test group.
- Two lines at the bottom of the screen make up the menu area. The first line lists the menu options you can select; press the left- or right-arrow key to highlight an option. The second line gives information about the highlighted option.

How to Use the Device Groups Menu

The **Device Groups** menu at the bottom of the screen provides options that enable you to select and run specific diagnostic tests from the diagnostics main screen. Press the left- and right-arrow keys to select the options on the menu. As you move from one menu option to another, a brief explanation of the highlighted option appears on the bottom line of the screen.

If you want more information about a device group or device, highlight the **Help** option and press <Enter>. After you read the information, press <Esc> to return to the previous screen.

Device Groups Menu Options

Five options are listed at the bottom of the diagnostics main screen: **Run Tests**, **Devices**, **Select**, **Config**, and **Help**.

There are two ways to select a menu option:

- Look on the screen to see which letter in the option is capitalized, and type that letter (for example, type **r** to select the **Run** option).
- Move the highlight to the option you want to select by pressing the left- or right-arrow key, and then press <Enter>.

Whenever one of the options is selected, additional choices become available.

The following subsections explain the menu options as listed from left to right in the **Device Groups** menu.

Run Tests

Run Tests displays seven options: **One**, **All**, **Select**, **Options**, **Results**, **Errors**, and **Help**. If you select **One**, all the devices within the highlighted device group are run. If you select **All**, all of the tests in all of the device group tests are run. (The device group tests are run in the same order as they are listed.) If you choose **Select**, only the selected device groups or the devices that you selected within the device groups are run. Before you test any device groups or devices, consider setting global parameters within **Options**. Table 5-1 lists all of the possible values for each option. Global parameters offer you greater control over how the device group tests or device tests are run and how results are reported. **Help** displays a series of help options, including **Menu**, **Keys**, **Device Group**, **Device**, **Test**, and **Versions**.

Table 5-1. Options

Option	Possible Values
Number of Times to Repeat Test(s)	0001 through 9999 or 0000 , which loops indefinitely until you press <Ctrl><Break>. The default is 1 .
Maximum Errors Allowed	0000 through 9999 , where 0000 means that there is no error limit. The default is 1 .
Pause for User Response	Yes, No Allows you to decide whether tests will wait for user input. The default is Yes to wait for user input.
Message Logging	None, Errors, All Determines if any test results are saved to a file. The default is None .
Message Logging File Name	Specifies the name of the logging file if the Message Logging option is selected. The default is A: RESULT .
Display Detailed Messages	Yes, No Enables or disables detailed messages.

Devices

Most of the device groups consist of several devices. Use the **Devices** option to select individual devices within the device group(s).

When you select **Devices**, the following options are displayed: **Run Tests**, **Tests**, **Select**, **Parameters**, and **Help**. Table 5-2 lists all of the possible values for each option.

Table 5-2. Devices Options

Option	Functions
Run Tests	Displays five options: One, All, Select, Options, Results, Errors, and Help.
Tests	Allows you to select individual devices to tailor the testing process to your particular needs. You can choose one or more devices from the list. When you choose Tests , four options are displayed: Run Tests, Select, Parameters, and Help.
Select	Allows you to choose one or more devices from a particular device group. Three options are displayed: One, All, and Help.
Parameters	Determines how a particular test runs.
Help	Displays a list of help topics.

Select

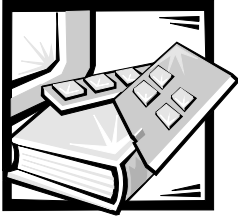
The **Select** option in the **Device Groups** menu allows you to choose one or more devices from a particular device group. Three options are displayed: **One, All,** and **Help.**

Config

Choosing **Config** from the **Device Groups** menu displays information about the particular device that is highlighted.

Error Messages

When you run a test in the diagnostics, error messages might result. Record the messages on a copy of the Diagnostics Checklist; also see Chapter 10, "Getting Help," for instructions on obtaining technical assistance and informing the technical assistance representative of these messages.



CHAPTER 6

Checking the Equipment

This chapter provides troubleshooting procedures for equipment that connects directly to the input/output (I/O) panel of the system, such as the monitor, keyboard, or mouse. Before you perform any of the procedures in this chapter, see “Checking Connectors and Switches” in Chapter 2. Follow the troubleshooting procedures for the equipment that is malfunctioning.



NOTES: To perform the procedures in this chapter, make sure you have the system documentation available for reference. You must connect a keyboard, mouse, and monitor to your system.

When you see the question “Is the problem resolved?” in a troubleshooting procedure, perform the operation that caused the problem.

Troubleshooting the Monitor

Troubleshooting video problems involves determining which of the following items is the source of the problem:

- Monitor and monitor interface cable
- Video memory
- Video logic of the system or a video expansion card

If information on the monitor screen is displayed incorrectly or not at all, perform the following steps to solve the problem:

1. Adjust the switches and controls including the horizontal and vertical position and size, as specified in the monitor’s documentation, to correct the video image.

Is the problem resolved?

Yes. You have fixed the problem.

No. Go to step 2.

2. Run the video tests in the Dell Diagnostics.

Is the monitor displaying text properly?

Yes. Go to step 3.

No. The video controller is faulty; see Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

3. Run the video tests in the Dell Diagnostics.

Did the tests run successfully?

Yes. You have fixed the problem, or the problem is software-related. For information about installing video drivers, see “Using the *Dell OpenManage Server Assistant* CD,” in the *User's Guide*.

No. Go to step 4.

4. Power off the system and disconnect it from the electrical outlet.
5. Swap the monitor with one of the same type that is working, and reconnect the system to the electrical outlet.
6. Run the video tests in the Dell Diagnostics again.

Did the tests run successfully?

Yes. The monitor must be replaced. See Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

No. The video controller is faulty; see Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

Troubleshooting the Keyboard

This procedure determines what kind of keyboard problem you might have. If a system error message indicates a keyboard problem when you start the system or while the Dell Diagnostics is running, perform the following steps:

1. Look at the keyboard and the keyboard cable for any signs of damage.

Press and release each key on the keyboard.

Do the keyboard and its cable appear to be free of physical damage, and do the keys work?

Yes. Go to step 3.

No. Go to step 2.

2. Swap the faulty keyboard with a working keyboard. To swap a faulty keyboard, unplug the keyboard cable from the system's back-panel and plug in a working keyboard.

Is the problem resolved?

Yes. The keyboard must be replaced. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

No. Go to step 3.

3. Run the keyboard test in the Dell Diagnostics.

Can you use the keyboard to select the keyboard test?

Yes. Go to step 5.

No. Go to step 4.

4. Swap the faulty keyboard with a working keyboard.

5. Did the keyboard test run successfully?

Yes. The keyboard must be replaced. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

No. The keyboard controller on the system board is faulty. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

Troubleshooting the Basic I/O Functions

This procedure determines whether the system's basic I/O functions are operational. If a system error message indicates an I/O port problem or the device connected to the port does not function properly, perform the following steps:

1. Enter the System Setup program, and check the **Serial Port 1** settings.

Is the communications port set to **Enabled**?

Yes. Go to step 3.

No. Go to step 2.

2. Change the **Serial Port 1** settings to **Enabled**. Reboot the system.

Is the problem resolved?

Yes. You have fixed the problem.

No. Go to step 3.

3. Check the contents of the start-up files. See "Installing and Configuring Software" in Chapter 4, "Finding Software Solutions."

Are the port configuration commands correct?

Yes. Go to step 5.

No. Go to step 4.

4. Change the necessary statements in the start-up files. If the port problem is confined to a particular application program, see the application program's documentation for specific port configuration requirements.

Is the problem resolved?

Yes. You have fixed the problem.

No. Go to step 5.

5. Reboot the system from the diagnostics diskette, and run the serial ports test in the Dell Diagnostics.

Did the tests run successfully?

Yes. Go to step 6.

No. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

6. If the problem persists, go to the following section, "Troubleshooting a Serial I/O Device."

Troubleshooting a Serial I/O Device

If the procedure in "Troubleshooting the Basic I/O Functions" indicates that the problem is with a device connected to the serial port, perform the following steps:

1. Power off the system and any peripheral device connected to the serial port.
2. Swap the interface cable that connects the device to the serial port with a known working cable.

Is the problem resolved?

Yes. The interface cable must be replaced. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

No. Go to step 3.

3. Power off the system and the serial device, and swap the device with a comparable working device.

For example, if the serial mouse has a problem, swap it with a serial mouse that you know is working properly.

4. Power on the system and the serial device.

Is the problem resolved?

Yes. The serial device must be replaced. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

No. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

Troubleshooting USB Devices

If a system error message indicates a problem with the universal serial bus (USB) connectors or the device connected to the port does not function properly, perform the following steps:

1. Enter the System Setup program, and check that the USB connectors are enabled.
2. Power off the system and any devices connected to the USB connectors.

Are two USB devices connected to the system?

Yes. Go to step 3.

No. Go to step 5.

3. Disconnect the devices from USB connectors 1 and 2, and connect the malfunctioning device to the opposite connector.
4. Power on the system and the reconnected device.

Is the problem resolved?

Yes. The USB connector might be defective. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

No. Go to step 5.

5. If possible, swap the interface cable that connects the device to the USB connector with a known working cable.

Is the problem resolved?

Yes. The interface cable must be replaced. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

No. Go to step 6.

6. Power off the system and the USB device, and swap the device with a comparable working device.

7. Power on the system and the USB device.

Is the problem resolved?

Yes. The USB device must be replaced. See Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

No. See Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

Troubleshooting the Integrated NICs

If you encounter problems with the system's integrated network interface controllers (NICs), the following actions may help you to diagnose the problem:

- Enter the System Setup program and confirm that the NICs are enabled. See “Using the System Setup Program” in the *User's Guide* for instructions.
- Check the network status indicators for each network channel on the system's front panel (see Figure 2-4).

The link/activity indicator lights when the system is connected to a network and blinks when activity occurs on the channel.



NOTE: If you can connect to the network but are having problems accessing network resources, contact your network administrator.

- Check the network connections on the system's back panel (see Figure 2-1).
 - Check the network connector for physical damage.
 - Ensure that both ends of the network cable are inserted properly.
 - Press one end of the unshielded twisted pair (UTP) Ethernet cable into the network connector until the cable snaps securely into place. Connect the other end of the cable to an RJ45 jack wall plate or to an RJ45 port on a UTP concentrator or hub, depending on your network configuration.
 - Replace the patch cable or network cable from the wall jack to the system.
 - If replacing the patch cable or network cable does not solve the problem, try moving the system to a known working location on the network.
- The network driver files may be damaged or deleted.

Back up your hard-disk drive, then reinstall the network driver files. For more information, see the operating system software documentation.

- Run the network interface test in the Dell Diagnostics.

For more information, see Chapter 5, “Running the Dell Diagnostics.”

If you cannot resolve the problem, see Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

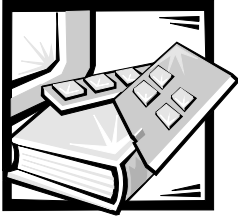
Network Cable Requirements

NOTICE: To avoid line interference, voice and data lines must be in separate sheaths.

Observe the following cabling restrictions for 10BASE-T and 100BASE-TX networks:

- For 10BASE-T networks, use Category 3 or Category 5 wiring and connectors.
- For 100BASE-TX networks, use Category 5 wiring and connectors.
- The maximum cable run length (from your system to a concentrator or hub) is 100 meters (m) (328 feet [ft]).
- The maximum number of systems (not counting concentrators or hubs) on a network is 1024.
- For 10BASE-T networks, the maximum number of daisy-chained concentrators or hubs on one network segment is four.

Check with your network administrator for specific information about your network.



CHAPTER 7

Checking Inside the System

This chapter provides troubleshooting procedures for components inside the system. Before you start any of the procedures in this chapter, take the following steps:

- Perform the procedures described in “Checking Connectors and Switches” in Chapter 2.
- Read the safety instructions in “Safety First—For You and Your System” in the next section of this chapter.

You need your system’s *User’s Guide* to perform the procedures in this chapter.



NOTE: When you see the question “Is the problem resolved?” in a troubleshooting procedure, perform the operation that caused the problem.

Safety First—For You and Your System

The procedures in this guide require that you open the system cover and work inside the system. While working inside the system, do not attempt to service the system except as explained in this guide and elsewhere in Dell documentation. Always follow the instructions closely. See the safety instructions in your *Dell PowerEdge System Information* document for important safety information.



WARNING FOR YOUR PERSONAL SAFETY AND PROTECTION OF THE EQUIPMENT

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

- 1. Power off and disconnect your system and peripherals from their power sources (unless you are installing or removing a hard-disk drive). Also, disconnect any telephone or telecommunication lines from the system.**
- 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 system, before touching anything inside your system.**
- 3. While you work, periodically touch an unpainted metal surface on the system chassis to dissipate any static electricity that might harm internal components.**

In addition, Dell recommends that you periodically review the safety instructions for this system.

Removing and Replacing the Optional Front Bezel

You must remove the system's optional front bezel before removing the system from the rack, installing or removing a hard-disk drive, or using the diskette or CD-ROM drive.

Removing the Optional Front Bezel

To remove the front bezel, press the retention tab on each end of the bezel and remove the bezel from the chassis (see Figure 7-1).

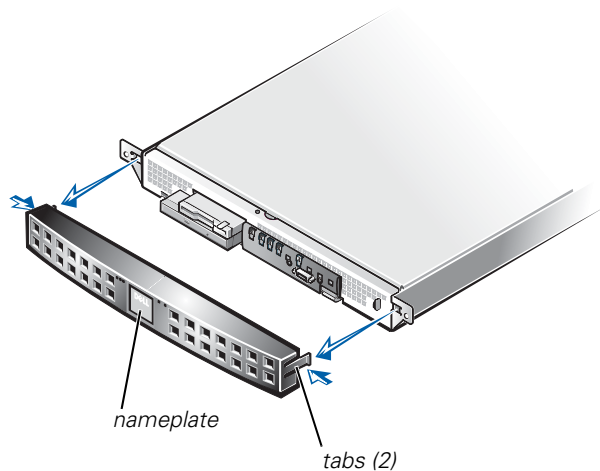


Figure 7-1. Removing the Bezel

Replacing the Optional Front Bezel

To replace the front bezel, insert the retention tabs on each end of the bezel and press the bezel toward the chassis until it locks into place (see Figure 7-1). Ensure that the bezel is oriented so that its status indicators are positioned just above the Dell nameplate in the center of the bezel.

Opening the System 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.

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

To open the system cover, perform the following steps.



CAUTION: Observe the precautions in “Safety First—For You and Your System.” Also observe the safety instructions in your *System Information* document.

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 (Figure 7-2).
4. Slide the top cover back and lift the cover up and off the system chassis.

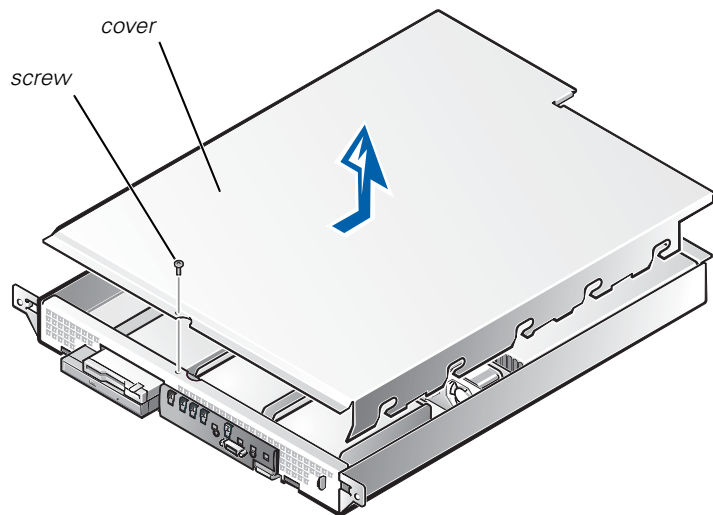


Figure 7-2. Opening the System Cover

Replacing the System Cover



NOTE: When sliding the system back into the rack, ensure that none of the internal wiring or cables interferes with 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.

- Secure the cover with the screw you removed when you opened the cover (see Figure 7-2).

Inside the System

In Figure 7-3, the cover is removed to provide an interior view. Figure 7-3 also identifies the drive bays. Use this illustration to locate interior features and components discussed later in this guide.

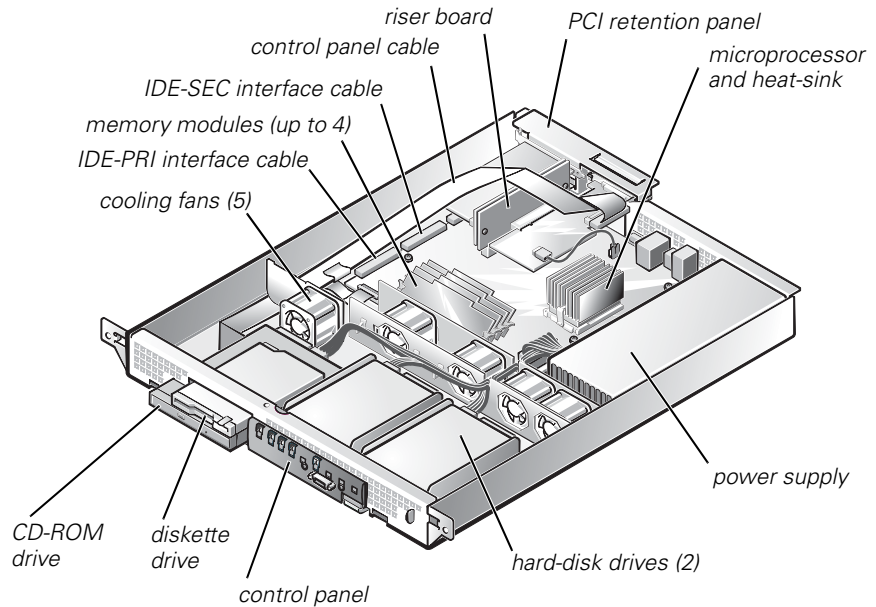


Figure 7-3. Inside the System

The system board holds the system's control circuitry and other electronic components. Several hardware options such as the microprocessor and memory are installed directly on the system board.

The expansion card riser board accommodates one full-length peripheral component interconnect (PCI) expansion card and one low-profile PCI card (occupied by the video controller).

The peripheral bays provide space for an integrated 3.5-inch diskette drive and CD-ROM drive, and two 1-inch hard-disk drives. For more information, see Chapter 9, "Installing Drives".

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.

Troubleshooting a Wet System

Liquid spills, splashes, and excessive humidity can cause damage to the system. If an external device (such as an external drive) gets wet, contact the device manufacturer for instructions. If the system gets wet, perform the following steps:

1. Power off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

NOTICE: See **“Protecting Against Electrostatic Discharge”** in the safety instructions in your **System Information** document.

2. Open the system cover.
3. Let the system dry for at least 24 hours.
Make sure that it is thoroughly dry before proceeding.
4. Remove all expansion cards installed in the system.
See “Removing an Expansion Card” in Chapter 8.
5. Close the system cover, reconnect the system to the electrical outlet, and power on the system.

Does the system have power?

Yes. Go to step 6.

No. See Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

6. Power off the system, disconnect it from the electrical outlet, open the system cover, and reinstall all expansion cards you removed in step 4.
7. Close the system cover and reconnect the system to the electrical outlet.
8. Run the Dell Diagnostics and test the system.

Did the tests run successfully?

Yes. The system is operating properly.

No. See Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

Troubleshooting a Damaged System

If the system was dropped or damaged while being moved, you should check the system to see if it functions properly. If an external device attached to the system is dropped or damaged, contact the manufacturer of the device for instructions or see Chapter 10, “Getting Help,” for information on obtaining technical assistance from Dell.

To troubleshoot a damaged system, perform the following steps:

1. Power off the system, including any attached peripherals, and disconnect the system from its electrical outlet.

NOTICE: See “Protecting Against Electrostatic Discharge” in the safety instructions in your *System Information* document.

2. Open the system cover.
3. Check the expansion-card connections to the riser board and PCI2 connector on the system board.
4. Verify all internal cable and component connections.

Make sure that all cables are properly connected and that all components are properly seated in their connectors and sockets.

5. Close the system cover and reconnect the system to the electrical outlet.
6. Run the system board tests in the Dell Diagnostics.

Did the tests run successfully?

Yes. The system is operating properly.

No. See Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

Troubleshooting the Battery

If an error message indicates a problem with the battery, or if the System Setup program loses the system configuration information when the system is turned off, the battery may be defective.

To troubleshoot the battery, perform the following steps:

1. Power off the system, including any attached peripherals, and disconnect the system from its electrical outlet.

NOTICE: See “Protecting Against Electrostatic Discharge” in the safety instructions in your *System Information* document.

2. Open the system cover.

3. Check the connection of the coin cell battery to the system board.

See "Replacing the Battery" in Chapter 8, "Installing System Board Options," for information on gaining access to the battery socket.

4. Is the battery firmly installed in the battery socket on the system board?

Yes. Go to step 7.

No. Go to step 6.

5. Reseat the battery in its socket.

6. Close the system cover and reconnect the system to the electrical outlet.

Is the problem resolved?

Yes. The battery was loose. You have fixed the problem.

No. Continue with this procedure.



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.

7. Repeat steps 1 and 2.

8. Replace the battery.

Is the problem resolved?

Yes. The battery's charge was low. You have fixed the problem.

No. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

Troubleshooting the Power Supply

The green light-emitting diode (LED) on the control panel (see Figure 2-4) signals the system power status. The LED is normally green when the system is on and running. Replace the power supply as described in the following subsection.



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.

Power Supply Removal and Replacement

To remove a power supply, perform the following steps.



CAUTION: Observe the precautions in “Safety First—For You and Your System” presented earlier in this chapter. Also observe the safety instructions in your *System Information* document.



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” in the safety instructions in your *System Information* document.



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 system 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 7-4).
7. Lift the power supply out of the chassis.

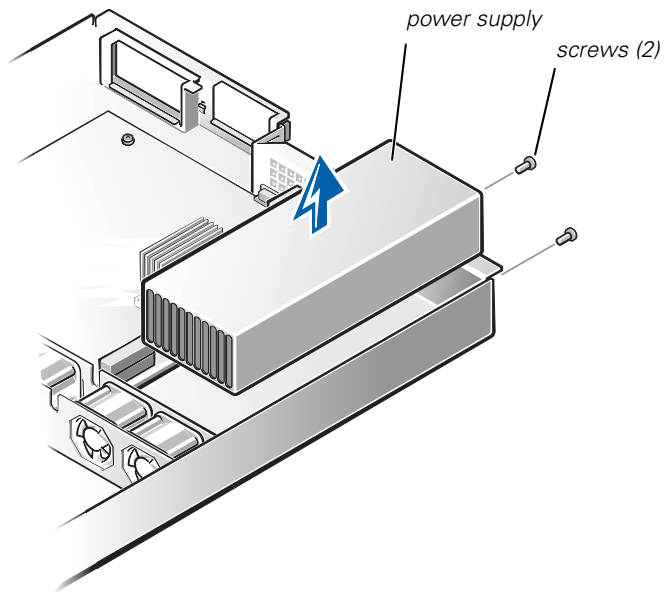


Figure 7-4. Power Supply Removal

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. Power on the system and observe the front-panel status indicators for normal operation.

Troubleshooting a Cooling Fan

Five cooling fans are installed in the system chassis. (See Figure 7-5 for fan orientation. Fan 1 is the outermost fan in the fan assembly, located directly behind the CD-ROM drive.) If you observe that one of the cooling 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: Observe the precautions in “Safety First—For You and Your System” presented earlier in this chapter. Also observe the safety instructions in your *System Information* document.

NOTICE: See “Protecting Against Electrostatic Discharge” in the safety instructions in your *System Information* document.

1. Power off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
2. Remove the system 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 (see Figure 7-5).

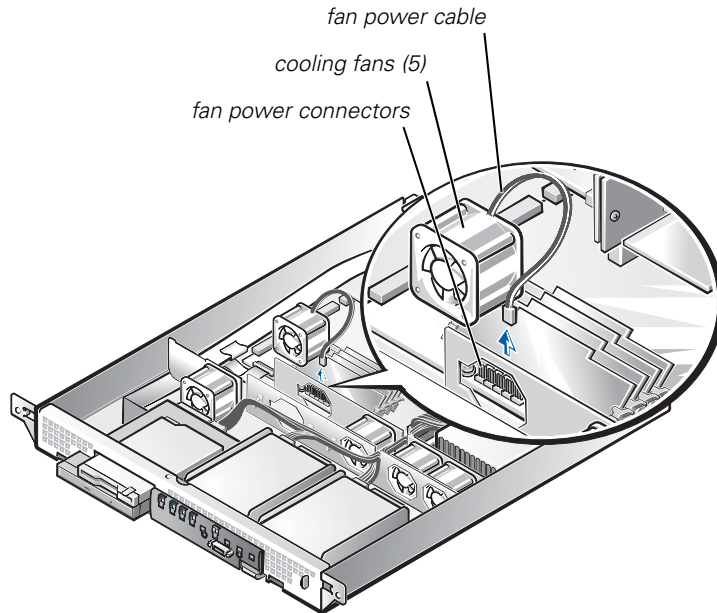


Figure 7-5. Removing a Cooling Fan

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.

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 7-5). 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. Power on the system. Do the fans operate properly?

Yes. You have fixed the problem.

No. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

Troubleshooting Expansion Cards

If an error message indicates an expansion-card problem or if an expansion card seems to perform incorrectly or not at all, the problem could be a faulty connection, a conflict with software or other hardware, or a faulty expansion card. To troubleshoot expansion cards, perform the following steps:

1. Power off the system, including any attached peripherals and disconnect the AC power cable from its power source.

NOTICE: See “Protecting Against Electrostatic Discharge” in the safety instructions in your *System Information* document.

2. Open the system cover.

See “Opening the System Cover” presented earlier in this chapter.

3. Remove the expansion card.

See “Removing an Expansion Card” in Chapter 8.

4. If the removed expansion card was installed on the riser board, remove the riser board.

See “Removing and Replacing the Riser Board” in Chapter 8.

5. If the expansion card uses the riser board, reinstall the riser board.

See “Removing and Replacing the Riser Board” in Chapter 8.

6. Reinstall the expansion card.

See “Installing an Expansion Card” in Chapter 8.

7. Close the system cover, reconnect the system to AC power, and power on the system.

Is the problem resolved?

Yes. The riser board or expansion card connections were loose. You have fixed the problem.

No. Go to step 8.

8. Remove all expansion cards from the system.

See “Removing an Expansion Card” in Chapter 8.

9. Run the system memory test in the Dell Diagnostics.

Did the test run successfully?

Yes. Go to step 10.

No. See Chapter 10, “Getting Help,” for information on obtaining technical assistance.

10. Power off the system, disconnect it from AC power, and open the system cover.
11. Reinstall one of the expansion cards you removed in step 8.
12. Run the system memory test in the Dell Diagnostics.

Did the test run successfully?

Yes. Go to step 13.

No. See Chapter 10, "Getting Help," for information on obtaining technical assistance.

13. Repeat steps 11 and 12 for the remaining expansion card that you removed in step 8.

Have you reinstalled all of the expansion cards without encountering a test failure?

Yes. You have fixed the problem.

No. See Chapter 10, "Getting Help," for information on obtaining technical assistance.

Troubleshooting System Memory

A system memory problem can be a faulty dual in-line memory module (DIMM) or a faulty system board. If a random-access memory (RAM) error message appears, the system probably has a memory problem.

When you power on or reboot the system, the Caps Lock and Scroll Lock indicators on the keyboard should flash momentarily and then remain off. If the **Num Lock** category in the System Setup program is set to **On**, the Num Lock indicator should flash momentarily and then remain on; otherwise, it should remain off. Abnormal operation of these indicators can result from a defective DIMM.

To troubleshoot system memory, perform the following steps:

1. Power on the system, including any attached peripherals.

Is there an error message indicating invalid system configuration information after the memory count is completed?

Yes. Go to step 2.

No. Go to step 7.

2. Enter the System Setup program to check the system memory setting.
See “Using the System Setup Program,” in your *User's Guide* for instructions.
Does the amount of memory installed match the system memory setting?
Yes. Go to step 8.
No. Go to step 3.
3. Power off the system, including any attached peripherals, and disconnect the power cable from the electrical outlet.

NOTICE: See “Protecting Against Electrostatic Discharge” in the safety instructions in your System Information document.

4. Open the system cover.
5. Reseat the DIMMs in their sockets.
6. Close the system cover, reconnect the system to AC power, and power on the system.
7. Enter the System Setup program and check the system memory again.
Does the amount of memory installed match the system memory?
Yes. Go to step 8.
No. Go to step 9.
8. Reboot the system, and observe the monitor screen and the Num Lock, Caps Lock, and Scroll Lock indicators on the keyboard.
Does the monitor screen remain blank, and do the Num Lock, Caps Lock, and Scroll Lock indicators on the keyboard remain on?
Yes. Go to step 9.
No. Go to step 14.
9. Repeat steps 3 and 4.



NOTE: There are multiple configurations for the DIMMs. See “Memory Module Installation Guidelines,” in Chapter 8. The following steps are an example of one configuration.

10. Swap the DIMM in DIMM_0 with one of the same capacity.
11. Close the system cover and reconnect the system to an electrical outlet.

12. Reboot the system, and observe the monitor screen and the indicators on the keyboard.

Is the problem resolved?

Yes. You have fixed the problem.

No. Go to step 13.

13. Repeat steps 10 through 12 for each DIMM installed.

Is the problem resolved?

Yes. You have fixed the problem.

No. Go to step 14.

14. Run the system memory test in the Dell Diagnostics.

Did the test run successfully?

Yes. You have fixed the problem.

No. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

Troubleshooting the Video Subsystem

Troubleshooting video problems involves determining which of the following items is the source of the problem: the monitor, the monitor interface cable, the video memory, or the video logic of the system.

The following procedure troubleshoots problems with the video memory and video logic only. Before you begin, perform the procedure in "Troubleshooting the Monitor" in Chapter 6, "Checking the Equipment," to determine whether or not the monitor is the source of the problem.

To troubleshoot the video subsystem, run the video tests in the Dell Diagnostics.

Did the tests run successfully?

Yes. The problem is not related to video hardware. Go to Chapter 4, "Finding Software Solutions."

No. The integrated video controller is faulty. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

Troubleshooting the System Board

A system board problem can result from a defective system board component, a faulty power supply, or a defective component connected to the system board. If an error message indicates a system board problem, perform the following steps to troubleshoot the problem:

1. Power off the system, including any attached peripherals, and disconnect the system from its electrical outlet.

NOTICE: See “Protecting Against Electrostatic Discharge” in the safety instructions in your *System Information* document.

2. Open the system cover.
3. Remove all expansions cards. See “Removing an Expansion Card” in Chapter 8.
4. Close the system cover, reconnect the system to AC power, and power on the system.
5. Run the system board tests in the Dell Diagnostics.

Did the tests run successfully?

Yes. Go to step 6.

No. See Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

6. Power off the system and disconnect it from AC power.
7. Reinstall one of the expansion cards that you removed in step 3, repeat step 4, and continue with step 8.
8. Run the system board tests again.

Did the tests run successfully?

Yes. Go to step 9.

No. See Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

9. Repeat steps 6 through 8 for the remaining expansion card that you removed in step 3.

Have you reinstalled all of the expansion cards without a test failure?

Yes. You have fixed the problem.

No. One of the expansion cards is faulty. See Chapter 10, “Getting Help,” for instructions on obtaining technical assistance.

Troubleshooting the Diskette Drive Subsystem

If the monitor displays a system error message indicating a diskette drive problem during execution of either the boot routine or the Dell Diagnostics, the problem may be caused by any of the following conditions:

- An expansion card is interfering with proper drive operations.
- The diskette drive/CD-ROM drive cables are not firmly connected.
- The diskette drive is faulty.
- The system's power supply is not providing sufficient power for the drives.
- The system's diskette drive logic is faulty.

To troubleshoot the diskette drive subsystem, perform the following steps:

1. Enter the System Setup program, and verify that the diskette drive setting is configured correctly.

See "Using the System Setup Program," in the *User's Guide* for instructions.

2. Run the diskette drive test in the Dell Diagnostics to determine whether the diskette drive subsystem now works correctly.

Do the tests complete successfully?

Yes. You have fixed the problem.

No. Go to step 3.

3. Power off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
4. Open the system cover.

NOTICE: See "Protecting Against Electrostatic Discharge" in the safety instructions in your *System Information* document.

5. Remove all expansion cards from the system.
6. Close the system cover, reconnect the system to AC power, and power on the system.
7. Run the diskette drive test in the Dell Diagnostics to determine whether the diskette drive subsystem now works correctly.

Do the tests complete successfully?

Yes. An expansion card may be conflicting with the diskette drive logic, or you may have a faulty expansion card. Go to step 8.

No. The diskette drive subsystem is faulty. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

8. Reinstall one of the expansion cards that you removed in step 5, and repeat steps 6 and 7.
9. Close the system cover, reconnect the system to AC power, and power on the system.
10. Run the diskette drive tests in the Dell Diagnostics to determine whether the diskette drive subsystem now works correctly.
11. Repeat steps 8 through 10 until all expansion cards have been reinstalled or until one of the expansion cards prevents the system from booting from the diagnostics diskette.
12. Has an expansion card prevented the system from booting from the diagnostics diskette?

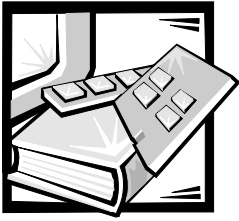
Yes. An expansion card is faulty. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

No. The diskette drive subsystem is faulty. See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.

Troubleshooting Hard-Disk Drives

If you have hard-disk drive problems, perform the following checks:

1. Back up the files on your hard-disk drive.
2. Run the appropriate integrated drive electronics (IDE) hard-disk drive tests as described in Chapter 5, "Running the Dell Diagnostics."
3. If necessary, see See Chapter 10, "Getting Help," for instructions on obtaining technical assistance.



CHAPTER 8

Installing System Board Options

This section describes how to install the following options:

- Expansion cards
- Memory modules
- Microprocessor

This section also includes instructions for replacing the system battery, if necessary.

Use Figure 8-1 to locate the system board features.



WARNING: Before you perform the procedures in this section, you must power off the system and disconnect it from its AC power source. For more information, see “Safety First—For You and Your System” in Chapter 7 and the safety instructions in the *System Information* document that came with your system.

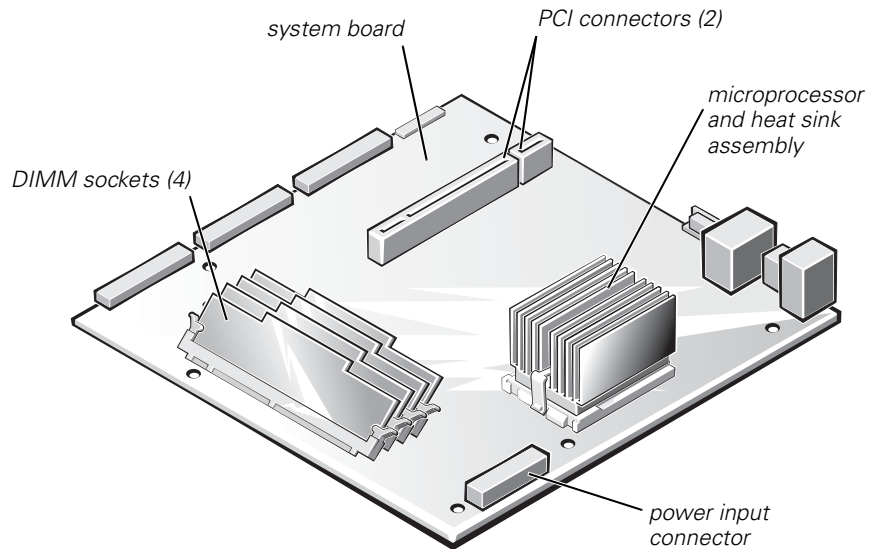


Figure 8-1. System Board Features

Expansion Cards

Expansion cards are installed on the system's riser board or the system board right angle connector. The riser board plugs into the PCI2 connector on the system board (see Figure 8-1) and is considered an extension of the system board.

The system board supports two 32-bit, 33-megahertz (MHz), peripheral component interconnect (PCI) expansion-card connectors. The low-profile PCI slot is occupied by the system's video controller card and only the full-length PCI slot is available for an expansion NIC card.

Removing an Expansion Card

To remove an expansion card, perform the following steps.



CAUTION: Observe the precautions in “*Safety First—For You and Your System*” in Chapter 7 and the safety instructions in the *System Information* document that came with your system.

NOTICE: See “*Protecting Against Electrostatic Discharge*” in the safety instructions in your *System Information* document.

1. Remove the cover.
2. Remove the two screws securing the PCI retention panel to the chassis back panel (see Figure 8-2).

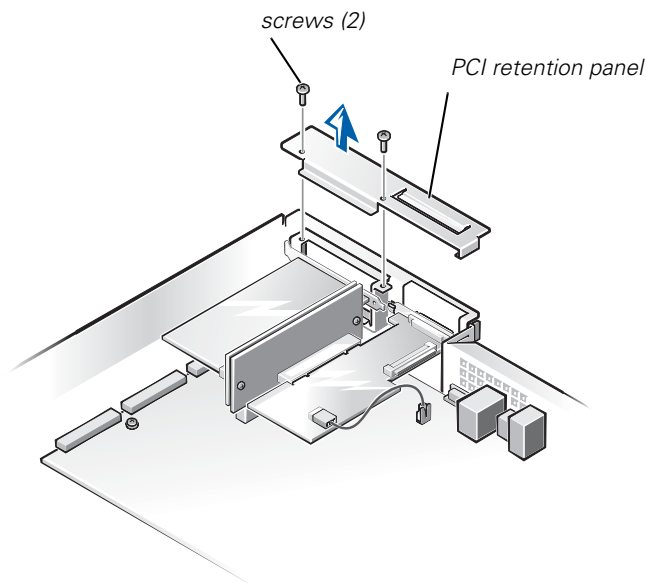


Figure 8-2. PCI Retention Panel Removal

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 8-3).
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 power them on.

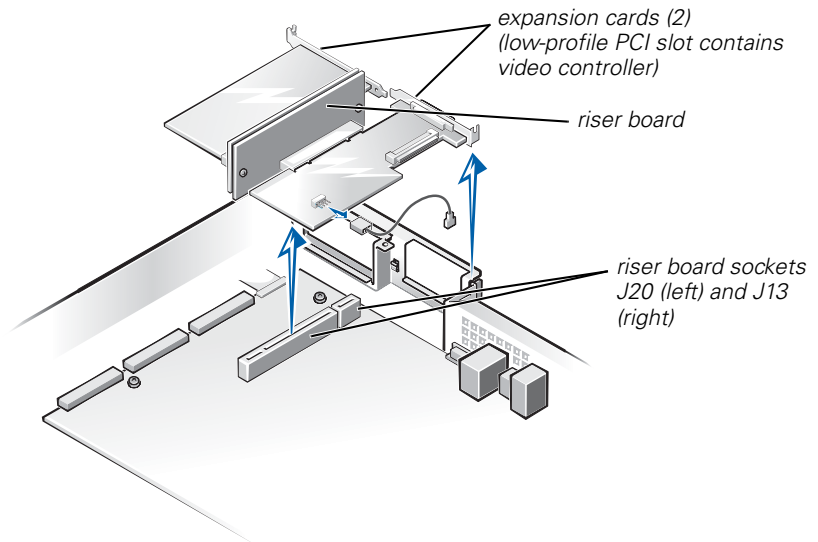


Figure 8-3. Expansion Card Removal

Installing an Expansion Card

To install an expansion card, perform the following steps.



CAUTION: Observe the precautions in “*Safety First—For You and Your System*” in Chapter 7 and the safety instructions in the *System Information* document that came with your system.

NOTICE: See “*Protecting Against Electrostatic Discharge*” in the safety instructions in your *System Information* document.

1. Remove the system 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 8-2).
4. Remove the riser board, together with installed expansion cards, from the system board. See “*Removing and Replacing the Riser Board*” in this chapter.
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. See “*Removing and Replacing the Riser Board*” in this chapter.
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 8-2).
9. Replace the cover, and then reconnect the system and peripherals to their AC power sources and power them on.

Removing and Replacing the Riser Board

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



CAUTION: Observe the precautions in “*Safety First—For You and Your System*” in Chapter 7. Also observe the safety instructions in your *System Information* document.

1. Remove the system cover if it is not already removed.

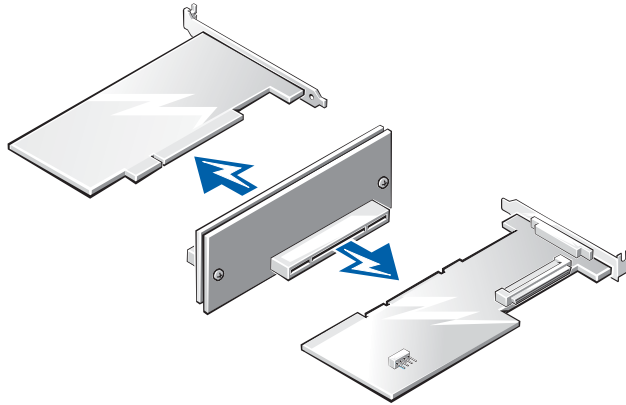


Figure 8-4. Riser Board Removal

2. Grasp the riser firmly and lift it up and out of the chassis (see Figure 8-4).
3. Disconnect any cables connected to the expansion cards.
4. Remove the expansion cards installed on the riser board.

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. See Figure 8-1 to locate the DIMM sockets.



CAUTION: Observe the precautions in **“Safety First—For You and Your System”** in Chapter 7 and the safety instructions in the **System Information** document that came with your system.

NOTICE: See **“Protecting Against Electrostatic Discharge”** in the safety instructions in your **System Information** document.

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 8-5). 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.

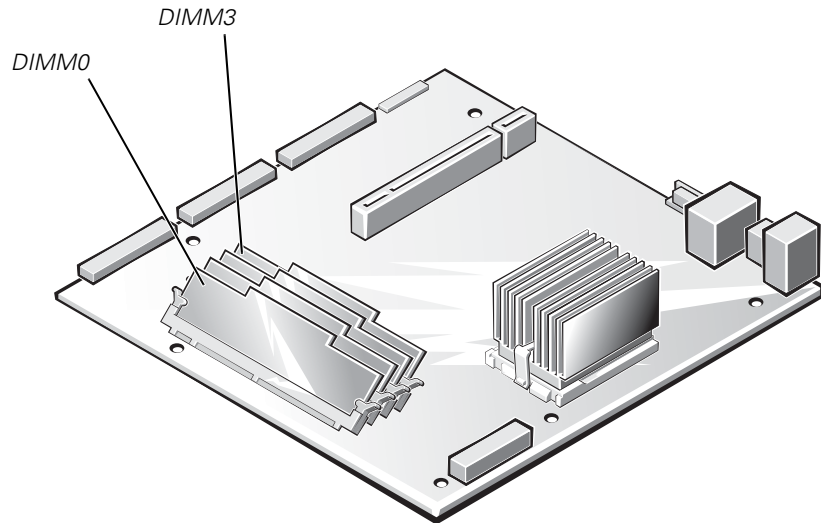


Figure 8-5. DIMM Sockets

Table 8-1 illustrates the valid memory configurations based on these guidelines.

Table 8-1. Sample DIMM 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 Installation and Replacement

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



CAUTION: Observe the precautions in **“Safety First—For You and Your System”** in **Chapter 7** and the safety instructions in the **System Information** document that came with your system.

NOTICE: See **“Protecting Against Electrostatic Discharge”** in the safety instructions in your **System Information** document.

1. Power 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 8-5 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.

When installing a memory module in DIMM3, perform the following steps:

1. 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.
2. Press the right-hand corner of the module into the DIMM3 socket (see Figure 8-6).
3. 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.
4. 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 (see Figure 8-7).

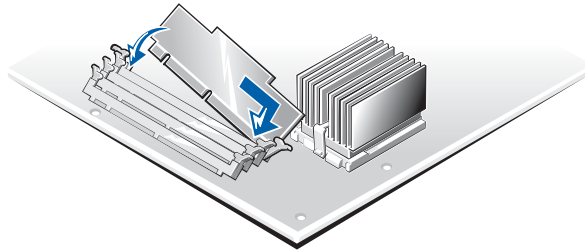


Figure 8-6. DIMM3 Installation

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 8-7).
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 8-7).

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 8-7).
4. When all of the DIMMs are properly seated in the sockets and the ejectors are in the locked position, verify that all of the DIMMs and all of the ejectors are in alignment with one another. Reseat any modules that appear to be out of alignment.
5. Replace the cover, replace the optional front bezel (if one is present), and reconnect the system to the electrical outlet, and power on the system.

After the system completes the 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, power 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 8-1.

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 6.

Carefully examine each DIMM to ensure proper seating in its socket.

8. Run the system memory test in the Dell Diagnostics (see Chapter 5, “Running the Dell Diagnostics” for complete information).

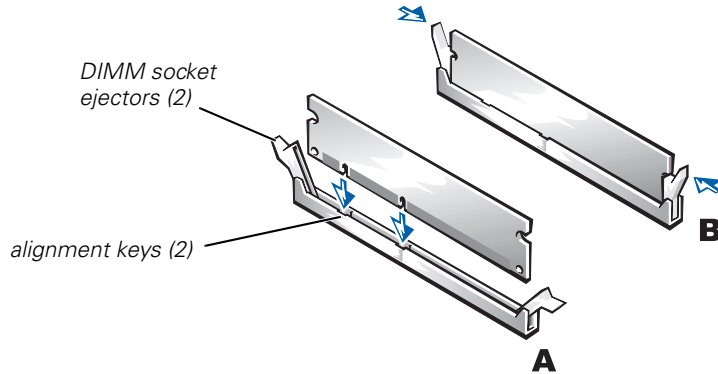


Figure 8-7. DIMM Installation

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 8-8).



CAUTION: Observe the precautions in “**Safety First—For You and Your System**” in Chapter 7 and the safety instructions in the **System Information** document that came with your system.

NOTICE: See “**Protecting Against Electrostatic Discharge**” in the safety instructions in your **System Information** document.



NOTES: This procedure assumes the power is off and you have access to the DIMM slots. See steps 1 through 6 in “**Memory Installation and 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.

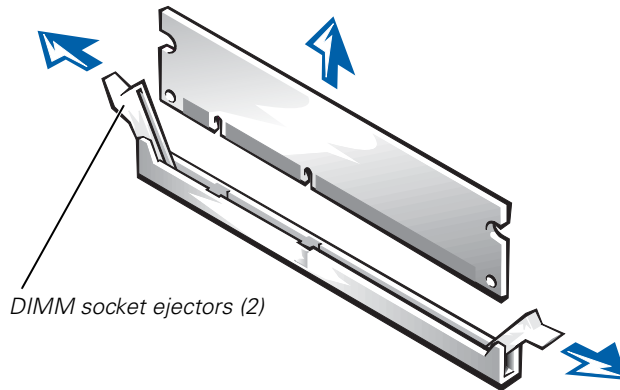


Figure 8-8. DIMM Removal

Replacing the 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: Observe the precautions in “Safety First—For You and Your System” in Chapter 7 and the safety instructions in the *System Information* document that came with your system.

NOTICE: See “Protecting Against Electrostatic Discharge” in the safety instructions in your *System Information* document.

Removing the Microprocessor and Heat Sink

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



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.

1. Power 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 system 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 8-9).

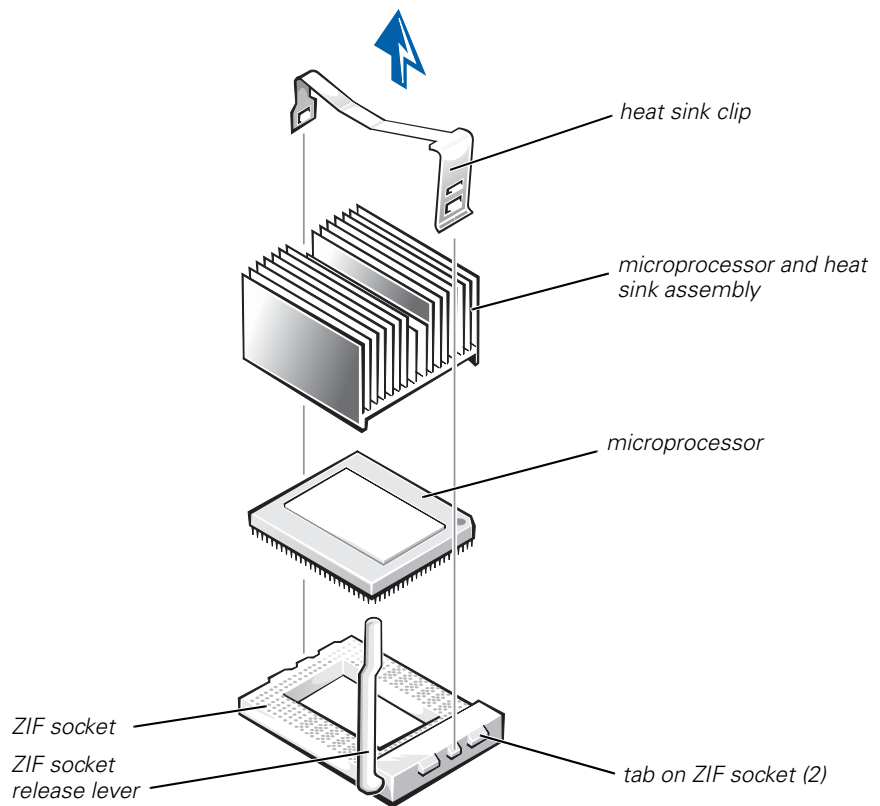


Figure 8-9. Microprocessor and Heat Sink Removal

Microprocessor and Heat Sink Assembly Replacement

To install the replacement microprocessor and heat sink assembly, see Figure 8-10 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 8-10).

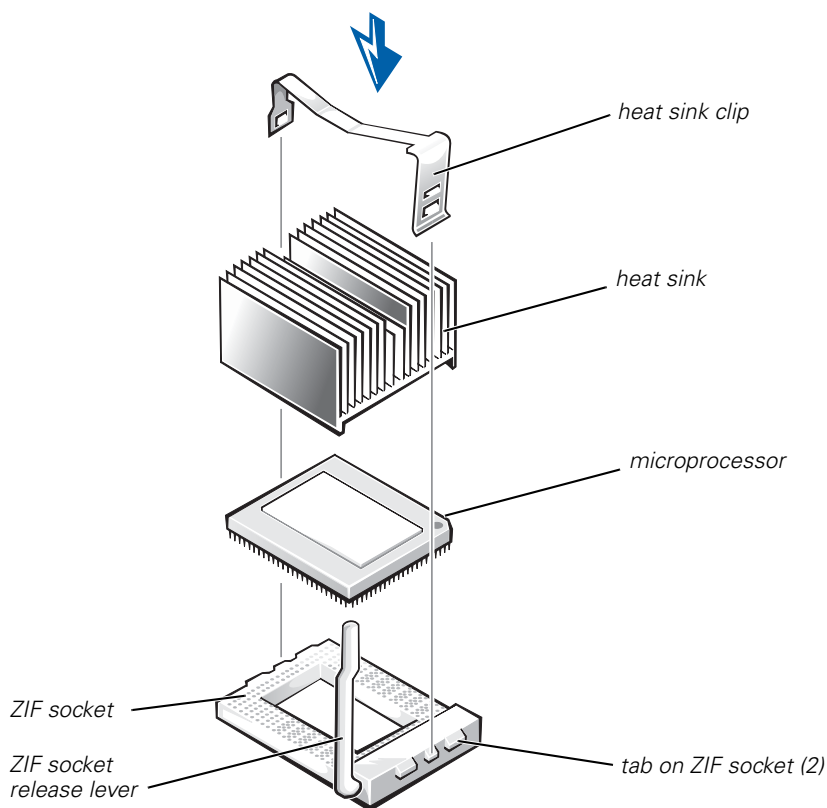


Figure 8-10. Microprocessor and Heat Sink Replacement

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 system cover, install the power cord, and power on the system.

Replacing the Battery

The system battery maintains system configuration, date, and time information in a special section of memory when you power 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. Power off and disconnect the system from the electrical outlet for a few hours, and then reconnect and power the system 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: Observe the precautions in “Safety First—For You and Your System” in Chapter 7 and the safety instructions in the *System Information* document that came with your 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.

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

See “Using the System Setup Program,” in the *User’s Guide* for instructions.

2. Shut down the system, including any attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system cover.
4. Remove the battery.

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 8-11).

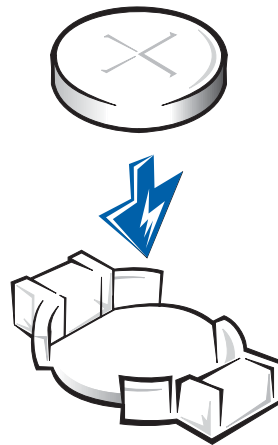
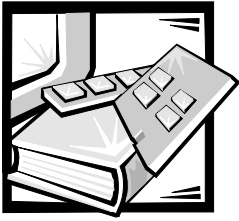


Figure 8-11. Installing the Battery

6. Close the system cover, and then reconnect the system and peripherals to their AC power sources and power 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, power off and disconnect the system from the electrical outlet for at least an hour.
10. After an hour, plug in and power on the system and enter the System Setup program. If the time and date are still incorrect, see Chapter 10, "Getting Help," for instructions on obtaining technical assistance.



CHAPTER 9

Installing Drives

This chapter explains how to remove and install hard-disk drives, diskette drives, and CD-ROM drives.

Hard-Disk Drives



CAUTION: Observe the precautions in “Safety First—For You and Your System” in Chapter 7 and the safety instructions in the *System Information* document that came with your system.

Figure 9-1 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.

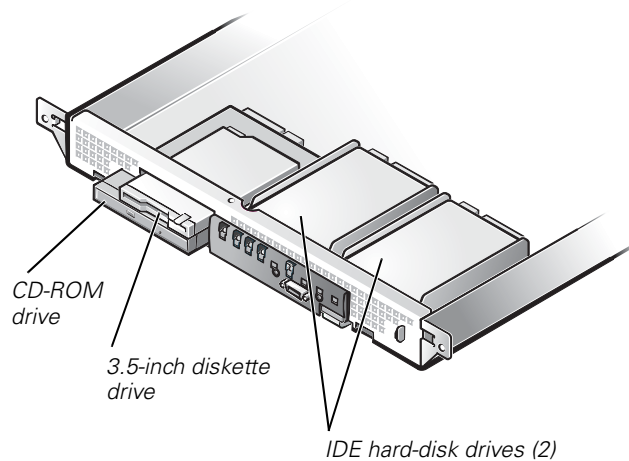


Figure 9-1. Drive Locations



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

Hard-Disk Drive Removal

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



CAUTION: Observe the precautions in “Safety First—For You and Your System” in Chapter 7 and the safety instructions in the *System Information* document that came with your system.

NOTICE: See “Protecting Against Electrostatic Discharge” in the safety instructions in your *System Information* document.

1. Shut down the system and disconnect the cables.
2. Remove the bezel.
3. If you have not already done so, remove the system 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 9-2).
5. Disconnect the power and IDE interface connectors, and set the hard-disk drive and bracket on a nonconductive work surface.

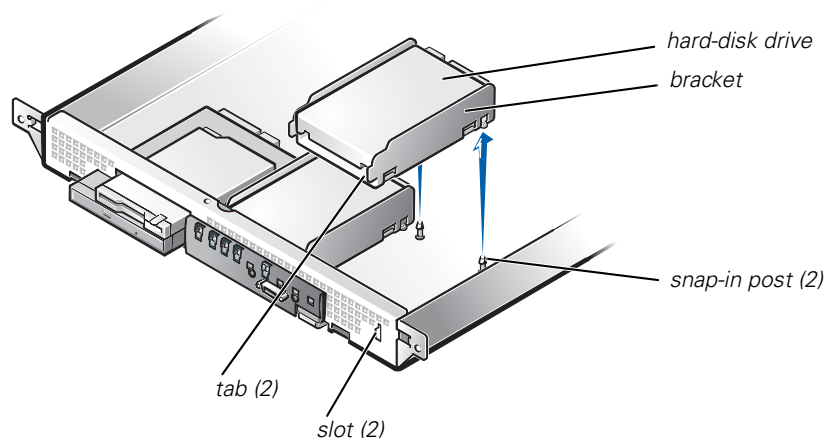


Figure 9-2. Hard-Disk Drive and Bracket Removal

6. Remove the four screws that secure the hard-disk drive to its bracket (see Figure 9-3).

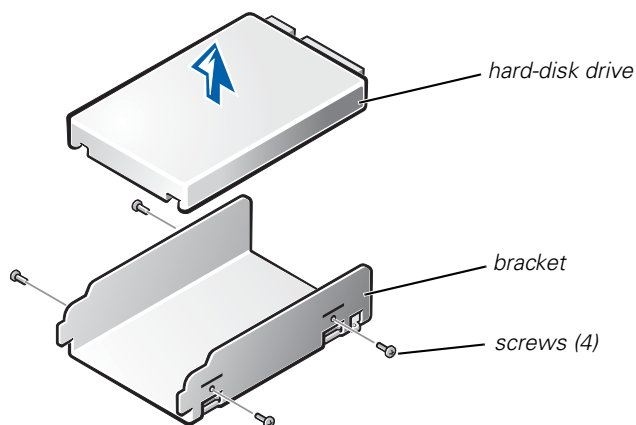


Figure 9-3. Hard-Disk Drive Removal From Bracket

Hard-Disk Drive Installation

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 9-3).
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 mating 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 system cover.
6. If you removed the front bezel in step 2 of “Hard-Disk Drive Removal,” reinstall it now.
7. Run the Dell Diagnostics (see Chapter 5, “Running the Dell Diagnostics”) to test and prepare the new drive.

Diskette Drive and CD-ROM Drive



CAUTION: Observe the precautions in “Safety First—For You and Your System” in Chapter 7 and the safety instructions in the *System Information* document that came with 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 9-4).

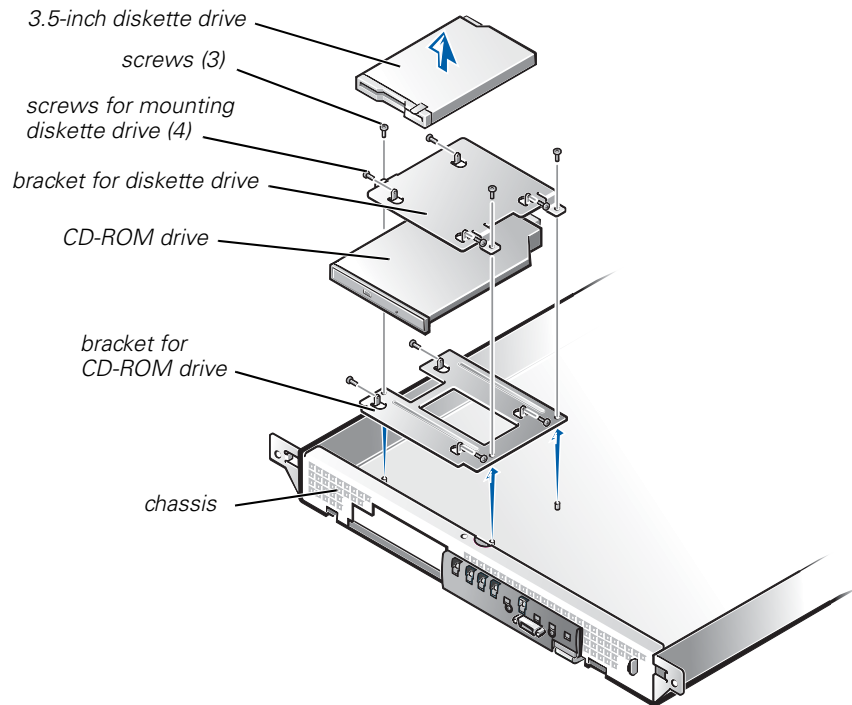
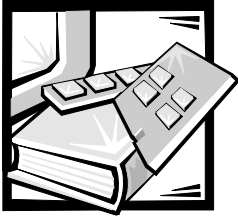


Figure 9-4. Diskette Drive and CD-ROM Drive Removal

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 9-4).

To install these drives, reverse the order of the steps.



CHAPTER 10

Getting Help

This chapter describes the tools Dell provides to help you when you have a problem with your system. It also tells you when and how to call Dell for technical or customer assistance.

Technical Assistance

If you need assistance with a technical problem, perform the following steps:

1. Complete the troubleshooting checks in Chapter 2, “Checking the Basics.”
2. Run the Dell Diagnostics as described in Chapter 5, “Running the Dell Diagnostics.”
3. Make a copy of the Diagnostics Checklist (found later in this chapter), and fill it out.
4. Use Dell’s extensive suite of online services available at Dell’s World Wide Web site (<http://support.dell.com>) for help with installation and troubleshooting procedures.

For more information, see “World Wide Web” found later in this chapter.

5. If the preceding steps have not resolved the problem, call Dell for technical assistance.

When prompted by Dell’s automated telephone system, enter your Express Service Code to route the call directly to the proper support personnel. If you do not have an Express Service Code, open the **Dell Accessories** folder, double-click the **Express Service Code** icon, and follow the directions.



NOTE: Dell’s Express Service Code system may not be available in all countries.

For instructions on using the technical support service, see “Technical Support Service” and “Before You Call” found later in this chapter.

Help Tools

Dell provides a number of tools to assist you. These tools are described in the following sections.



NOTE: Some of these tools are not always available in all locations outside the continental U.S. Please call your local Dell representative for information on availability.

World Wide Web

The Internet is your most powerful tool for obtaining information about your system and other Dell products. Through the Internet, you can access most of the services described in this section, including AutoTech, TechFax, order status, technical support, and product information.

You can access Dell's support Web site at **<http://support.dell.com>**. To select your country, click the map that appears. The **Welcome to support.dell.com** page opens. Enter your system information to access help tools and information.

Dell can be accessed electronically using the following addresses:

- World Wide Web

<http://www.dell.com/>

<http://www.dell.com/ap/> (for Asian/Pacific countries only)

<http://www.euro.dell.com> (for Europe only)

<http://www.dell.com/la> (for Latin American countries)

- Anonymous file transfer protocol (FTP)

[ftp.dell.com/](ftp.dell.com)

Log in as user: `anonymous`, and use your e-mail address as your password.

- Electronic Support Service

support@us.dell.com

apsupport@dell.com (for Asian/Pacific countries only)

support.euro.dell.com (for Europe only)

- Electronic Quote Service

sales@dell.com

apmarketing@dell.com (for Asian/Pacific countries only)

- Electronic Information Service

info@dell.com

AutoTech Service

Dell's automated technical support service—AutoTech—provides recorded answers to the questions most frequently asked by Dell customers about their portable and desktop systems.

When you call AutoTech, you use your touch-tone telephone to select the subjects that correspond to your questions.

The AutoTech service is available 24 hours a day, seven days a week. You can also access this service through the technical support service. For the telephone number to call, see “Dell Contact Numbers” found later in this chapter.

TechFax Service

Dell takes full advantage of fax technology to serve you better. Twenty-four hours a day, seven days a week, you can call the Dell TechFax line toll-free for all kinds of technical information.

Using a touch-tone phone, you can select from a full directory of topics. The technical information you request is sent within minutes to the fax number you designate. For the TechFax telephone number to call, see “Dell Contact Numbers” found later in this chapter.

Automated Order-Status System

You can call this automated service to check on the status of any Dell products that you have ordered. A recording prompts you for the information needed to locate and report on your order. For the telephone number to call, see “Dell Contact Numbers” found later in this chapter.

Technical Support Service

Dell's industry-leading hardware technical-support service is available 24 hours a day, seven days a week, to answer your questions about Dell hardware. Our technical support staff use computer-based diagnostics to provide fast, accurate answers to questions.

To contact Dell's technical support service, first see the section titled “Before You Call” and then call the number for your country as listed in “Dell Contact Numbers” found later in this chapter.

Problems With Your Order

If you have a problem with your order, such as missing parts, wrong parts, or incorrect billing, contact Dell for customer assistance. Have your invoice or packing slip handy when you call. For the telephone number to call, see “Dell Contact Numbers” found later in this chapter.

Product Information

If you need information about additional products available from Dell, or if you would like to place an order, visit Dell's World Wide Web site at <http://www.dell.com/>. For the telephone number to call to speak to a sales specialist, see "Dell Contact Numbers" found later in this chapter.

Returning Items for Warranty Repair or Credit

Prepare all items being returned, whether for repair or credit, as follows:

1. Call Dell to obtain an authorization number, and write it clearly and prominently on the outside of the box.

For the telephone number to call, see "Dell Contact Numbers" found later in this chapter.

2. Include a copy of the invoice and a letter describing the reason for the return.
3. Include a copy of the Diagnostics Checklist indicating the tests you have run and any error messages reported by the Dell Diagnostics.
4. Include any accessories that belong with the item(s) being returned (power cables, software diskettes, guides, and so on) if the return is for credit.
5. Pack the equipment to be returned in the original (or equivalent) packing materials.

You are responsible for paying shipping expenses. You are also responsible for insuring any product returned, and you assume the risk of loss during shipment to Dell. Collect-on-delivery (C.O.D.) packages are not accepted.

Returns that are missing any of the preceding requirements will be refused at our receiving dock and returned to you.

Before You Call



NOTE: Have your Express Service Code ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.

Remember to fill out the Diagnostics Checklist (Figure 10-1). If possible, turn on your system before you call Dell for technical assistance and call from a telephone at or near the system. You may be asked to type some commands at the keyboard, relay detailed information during operations, or try other troubleshooting steps possible only at the system itself. Make sure that the system documentation is available.



WARNING: If you need to remove the system covers, be sure to first disconnect the system's power and modem cables from all electrical outlets.

Diagnostics Checklist

Name: _____ Date: _____

Address: _____ Phone number: _____

Service tag (bar code on the back of the system): _____

Express Service Code: _____

Return Material Authorization Number (if provided by Dell support technician): _____

Operating system and version: _____

Peripherals: _____

Expansion cards: _____

Are you connected to a network? yes no

Network, version, and network card: _____

Programs and versions: _____

See your operating system documentation to determine the contents of the system's start-up files. If the system is connected to a printer, print each file. Otherwise, record the contents of each file before calling Dell.

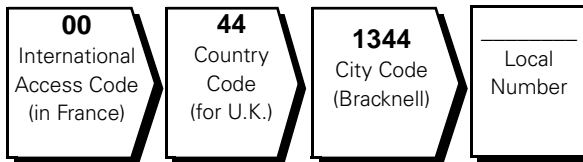
Error message, beep code, or diagnostic code: _____

Description of problem and troubleshooting procedures you performed: _____

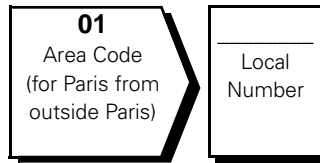
Figure 10-1. Diagnostics Checklist

Dell Contact Numbers

When you need to contact Dell, use the telephone numbers, codes, and electronic addresses provided in Table 10-1 and Table 10-2. Table 10-1 provides the various codes required to make long-distance and international calls. Table 10-2 provides local telephone numbers, area codes, toll-free numbers, Web site and e-mail addresses, if applicable, for each department or service available in various countries around the world. If you are making a direct-dialed call to a location outside of your local telephone service area, determine which codes to use (if any) in Table 10-1 in addition to the local numbers provided in Table 10-2. For example, to place an international call from Paris, France to Bracknell, England, dial the international access code for France followed by the country code for the U.K., the city code for Bracknell, and then the local number as shown in the following illustration.



To place a long-distance call within your own country, use area codes instead of international access codes, country codes, and city codes. For example, to call Paris, France from Montpellier, France, dial the area code plus the local number as shown in the following illustration.



The codes required depend on where you are calling from as well as the destination of your call; in addition, each country has a different dialing protocol. If you need assistance in determining which codes to use, contact a local or an international operator.



NOTE: Toll-free numbers are for use only within the country for which they are listed. Area codes are most often used to call long distance within your own country (not internationally)—in other words, when your call originates in the same country you are calling.

Table 10-1. International Dialing Codes

Country (City)	International Access Code	Country Code	City Code
Australia (Sydney)	0011	61	2
Austria (Vienna)	900	43	1
Belgium (Brussels)	00	32	2
Brazil	0021	55	51
Brunei	—	673	—
Canada (North York, Ontario)	011	—	Not required
Chile (Santiago)	—	56	2
China (Xiamen)	—	86	592
Czech Republic (Prague)	00	420	2
Denmark (Horsholm)	009	45	Not required
Finland (Helsinki)	990	358	9
France (Paris) (Montpellier)	00	33	(1) (4)
Germany (Langen)	00	49	6103
Hong Kong	001	852	Not required
Ireland (Bray)	16	353	1
Italy (Milan)	00	39	02
Japan (Kawasaki)	001	81	44
Korea (Seoul)	001	82	2
Luxembourg	00	352	—
Macau	—	853	Not required
Malaysia (Penang)	00	60	4
Mexico (Colonia Granada)	95	52	5
Netherlands (Amsterdam)	00	31	20
New Zealand	00	64	—
Norway (Lysaker)	095	47	Not required
Poland (Warsaw)	011	48	22
Portugal	00	35	—
Singapore (Singapore)	005	65	Not required

Table 10-1. International Dialing Codes (continued)

Country (City)	International Access Code	Country Code	City Code
South Africa (Johannesburg)	09/091	27	11
Spain (Madrid)	00	34	91
Sweden (Upplands Vasby)	009	46	8
Switzerland (Geneva)	00	41	22
Taiwan	002	886	—
Thailand	001	66	—
U.K. (Bracknell)	010	44	1344
U.S.A. (Austin, Texas)	011	1	Not required

Table 10-2. Dell Contact Numbers

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Australia (Sydney)	Home and Small Business		1-300-65-55-33
	Government and Business		toll free: 1-800-633-559
	Preferred Accounts Division (PAD)		toll free: 1-800-060-889
	Customer Care		toll free: 1-800-819-339
	Corporate Sales		toll free: 1-800-808-385
	Transaction Sales		toll free: 1-800-808-312
	Fax		toll free: 1-800-818-341
Austria (Vienna) <i>NOTE: Customers in Austria call Germany for technical and customer assistance.</i>	Home/Small Business Sales	01	795 567602
	Home/Small Business Fax	01	795 67605
	Home/Small Business Customer Care	01	795 67603
	Preferred Accounts/Corporate Customer Care		0660 8056
	Home/Small Business Technical Support	01	795 67604
	Preferred Accounts/Corporate Technical Support		0660 8779
	Switchboard	01	491 04 0
	Web site: http://support.euro.dell.com E-mail: tech_support_central_europe@dell.com		

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Belgium (Brussels)	Technical Support	02	481 92 88
	Customer Care	02	481 91 19
	Home/Small Business Sales		toll free: 0800 16884
	Corporate Sales	02	481 91 00
	Fax	02	481 92 99
	Switchboard	02	481 91 00
	Web site: http://support.euro.dell.com E-mail: tech_be@dell.com		
Brazil	Customer Support, Technical Support		0800 90 3355
	Sales		0800 90 3366
	Web site: http://www.dell.com/br		
Brunei <i>NOTE: Customers in Brunei call Malaysia for sales, customer, and technical assistance.</i>	Customer Technical Support (Penang, Malaysia)		633 4966
	Customer Service (Penang, Malaysia)		633 4949
	Transaction Sales (Penang, Malaysia)		633 4955
Canada (North York, Ontario)	Automated Order-Status System		toll free: 1-800-433-9014
	AutoTech (Automated technical support)		toll free: 1-800-247-9362
	Customer Care (From outside Toronto)		toll free: 1-800-387-5759
	Customer Care (From within Toronto)	416	758-2400
	Customer Technical Support		toll free: 1-800-847-4096
	Sales (Direct Sales—from outside Toronto)		toll free: 1-800-387-5752
	Sales (Direct Sales—from within Toronto)	416	758-2200
	Sales (Federal government, education, and medical)		toll free: 1-800-567-7542
	Sales (Major Accounts)		toll free: 1-800-387-5755
TechFax		toll free: 1-800-950-1329	

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
<p>Chile (Santiago)</p> <p><i>NOTE: Customers in Chile call the U.S.A for sales, customer, and technical assistance.</i></p>	Sales, Customer Support, and Technical Support toll free: 1230-020-4823		
<p>China (Xiamen)</p>	<p>Technical Support. toll free: 800 858 2437</p> <p>Customer Experience toll free: 800 858 2060</p> <p>Home and Small Business. toll free: 800 858 2222</p> <p>Preferred Accounts Division. toll free: 800 858 2062</p> <p>Large Corporate Accounts toll free: 800 858 2999</p>		
<p>Czech Republic (Prague)</p>	<p>Technical Support. 02 22 83 27 27</p> <p>Customer Care. 02 22 83 27 11</p> <p>Fax 02 22 83 27 14</p> <p>TechFax 02 22 83 27 28</p> <p>Switchboard 02 22 83 27 11</p> <p>Web site: http://support.euro.dell.com</p> <p>E-mail: czech_dell@dell.com</p>		
<p>Denmark (Horsholm)</p> <p><i>NOTE: Customers in Denmark call Sweden for fax technical support.</i></p>	<p>Technical Support. 45170182</p> <p>Relational Customer Care 45170184</p> <p>Home/Small Business Customer Care 32875505</p> <p>Switchboard 45170100</p> <p>Fax Technical Support (Upplands Vasby, Sweden) 859005594</p> <p>Fax Switchboard. 45170117</p> <p>Web site: http://support.euro.dell.com</p> <p>E-mail: den_support@dell.com</p>		

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number	
Finland (Helsinki)	Technical Support	09	253 313 60	
	Technical Support Fax	09	253 313 81	
	Relational Customer Care	09	253 313 38	
	Home/Small Business Customer Care	09	693 791 94	
	Fax	09	253 313 99	
	Switchboard	09	253 313 00	
	Web site: http://support.euro.dell.com E-mail: fin_support@dell.com			
France (Paris/Montpellier)	Home and Small Business			
	Technical Support	0825	387 270	
	Customer Care	0825	823 833	
	Switchboard	0825	004 700	
	Switchboard (Alternative)	04	99 75 40 00	
	Sales	0825	004 700	
	Fax	0825 . . . . .	.004 701
	Web site: http://support.euro.dell.com E-mail: web_fr_tech@dell.com			
	Corporate			
	Technical Support	0825	004 719	
	Customer Care	0825	338 339	
	Switchboard	01	55 94 71 00	
	Fax	01	55 94 71 99	
	Web site: http://support.euro.dell.com E-mail: web_fr_tech@dell.com			

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Germany (Langen)	Technical Support	06103	766-7200
	Home/Small Business Customer Care		0180-5-224400
	Global Segment Customer Care	06103	766-9570
	Preferred Accounts Customer Care	06103	766-9420
	Large Accounts Customer Care	06103	766-9560
	Public Accounts Customer Care	06103	766-9555
	Switchboard	06103	766-7000
Hong Kong <i>NOTE: Customers in Hong Kong call Malaysia for customer assistance.</i>	Technical Support		toll free: 800 96 4107
	Customer Service (Penang, Malaysia) . . . . .		.633 4949
	Transaction Sales		toll free: 800 96 4109
	Corporate Sales		toll free: 800 96 4108
Ireland (Bray)	Technical Support		0870 908 0800
	Customer Care	01 . . . . .	.204 4026
	Sales	01 . . . . .	.286 0500
	SalesFax	01 . . . . .	.204 0144
	Fax		0870 907 5590
	Switchboard	01 . . . . .	.286 0500
		Web site: http://support.euro.dell.com	
	E-mail: dell_direct_support@dell.com		

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Italy (Milan)	Home and Small Business		
	Technical Support	02	577 826 90
	Customer Care	02	696 821 14
	Fax	02	696 824 13
	Switchboard	02	696 821 12
	Web site: http://support.euro.dell.com		
	E-mail: web_it_tech@dell.com		
	Corporate		
	Technical Support	02	577 826 90
	Customer Care	02	577 825 55
	Fax	02	575 035 30
	Switchboard	02	577 821
	Web site: http://support.euro.dell.com		
	E-mail: web_it_tech@dell.com		
Japan (Kawasaki)	Technical Support (Server)		
	. . . . . toll free: 0120-1984-35		
	Technical Support (Dimension™ and Inspiron™)		
	. . . . . toll free: 0120-1982-26		
	Technical Support Outside of Japan (Dimension and Inspiron)		
	. . . . .81-44 520-1435		
	Technical Support (Dell Precision™, OptiPlex™, and Latitude™)		
	. . . . . toll free: 0120-1984-33		
	Technical Support Outside of Japan (Dell Precision, OptiPlex, and Latitude)		
	. . . . .81-44 556-3894		
	Customer Care 044 556-4240		
	24-Hour Automated Order Status Service 044 556-3801		
	Home and Small Business Group Sales 044 556-3344		
	Preferred Accounts Division Sales 044 556-3433		
Large Corporate Accounts 044 556-3430			
Faxbox Service 044 556-3490			
Switchboard 044 556-4300			
Web site: http://support.jp.dell.com			

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Korea (Seoul)	Technical Support		toll free: 080-200-3800
	Sales		toll free: 080-200-3777
	Customer Service (Seoul, Korea) . . . . .		.2194-6220
	Customer Service (Penang, Malaysia)		604-633-4949
	Fax . . . . .		.2194-6202
	Switchboard . . . . .		.2194-6000
Latin America <i>NOTE: Customers in Latin America call the U.S.A. for sales, customer, and technical assistance.</i>	Customer Technical Support (Austin, Texas, U.S.A.)	512 . . . . .	.728-4093
	Customer Service (Austin, Texas, U.S.A.)	512 . . . . .	.728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512 . . . . .	.728-3883
	Sales (Austin, Texas, U.S.A.)	512 . . . . .	.728-4397
	SalesFax (Austin, Texas, U.S.A.)	512 . . . . .	.728-4600 728-3772
	Luxembourg <i>NOTE: Customers in Luxembourg call Belgium for sales, customer, and technical assistance.</i>	Technical Support (Brussels, Belgium)	02 . . . . .	481 92 88
Home/Small Business Sales (Brussels, Belgium)			toll free: 080016884
Corporate Sales (Brussels, Belgium)		02	481 91 00
Customer Care (Brussels, Belgium)		02	481 91 19
Fax (Brussels, Belgium)		02	481 92 99
Switchboard (Brussels, Belgium)		02	481 91 00
Web site: http://support.euro.dell.com E-mail: tech_be@dell.com			
Macau <i>NOTE: Customers in Macau call Malaysia for customer assistance.</i>	Technical Support		toll free: 0800 582
	Customer Service (Penang, Malaysia) . . . . .		.633 4949
	Transaction Sales		toll free: 0800 581
Malaysia (Penang)	Technical Support		toll free: 1 800 888 298
	Customer Service	04 . . . . .	.633 4949
	Transaction Sales		toll free: 1 800 888 202
	Corporate Sales		toll free: 1 800 888 213

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Mexico <i>NOTE: Customers in Mexico call the U.S.A. for access to the Automated Order-Status System and AutoTech.</i>	Automated Order-Status System (Austin, Texas, U.S.A.)	512	728-0685
	AutoTech (Automated technical support) (Austin, Texas, U.S.A.)	512	728-0686
	Customer Technical Support	525	228-7870
	Sales	525	228-7811
			toll free: 91-800-900-37
			toll free: 91-800-904-49
	Customer Service Main	525	228-7878 228-7800
Netherlands (Amsterdam)	Technical Support	020	581 8838
	Customer Care	020	581 8740
	Home/Small Business Sales		toll free: 0800-0663
	Home/Small Business Sales Fax	020	682 7171
	Corporate Sales	020	581 8818
	Corporate Sales Fax	020	686 8003
	Fax	020	686 8003
	Switchboard	020	581 8818
New Zealand	Home and Small Business		0800 446 255
	Government and Business		0800 444 617
	Sales		0800 441 567
	Fax		0800 441 566
	Norway (Lysaker) <i>NOTE: Customers in Norway call Sweden for fax technical support.</i>	Technical Support		671 16882
Relational Customer Care			671 17514
Home/Small Business Customer Care			23162298
Switchboard			671 16800
Fax Technical Support (Upplands Vasby, Sweden)			590 05 594
Fax Switchboard			671 16865
Web site: http://support.euro.dell.com E-mail: nor_support@dell.com			

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Poland (Warsaw)	Technical Support	22	57 95 700
	Customer Care	22	57 95 999
	Sales	22	57 95 999
	Fax	22	57 95 998
	Switchboard	22	57 95 999
	Web site: http://support.euro.dell.com E-mail: pl_support@dell.com		
Portugal	Technical Support	35	800 834 077
	Customer Care	34	902 118 540 or
	. . . . .	35	800 834 075
	Sales	35	800 834 075
	Fax	35	121 424 01 12
	Switchboard E-mail: es_support@dell.com	34	917 229 200
Singapore (Singapore) <i>NOTE: Customers in Singapore call Malaysia for customer assistance.</i>	Technical Support	toll free: 800 6011 051	
	Customer Service (Penang, Malaysia)	04 . . . . .	.633 4949
	Transaction Sales	toll free: 800 6011 054	
	Corporate Sales	toll free: 800 6011 053	
South Africa (Johannesburg)	Technical Support	011	709 7710
	Customer Care	011	709 7707
	Sales	011	709 7700
	Fax	011	706 0495
	Switchboard	011	709 7700
	Web site: http://support.euro.dell.com E-mail: dell_za_support@dell.com		

Table 10-2. Dell Contact Numbers (continued)

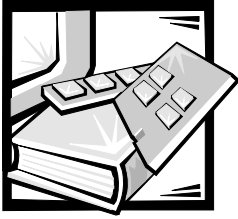
Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Southeast Asian/ Pacific Countries (excluding Australia, Brunei, China, Hong Kong, Japan, Korea, Macau, Malaysia, New Zealand, Singapore, Taiwan, and Thailand—see individual listings for these countries)	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia) 60 4 633 4810		
Spain (Madrid)	Home and Small Business Technical Support 902 100 130 Customer Care 902 118 540 Sales 902 118 541 Switchboard 902 118 541 Fax 902 118 539 Web site: http://support.euro.dell.com E-mail: web_esp_tech@dell.com Corporate Technical Support 902 100 130 Customer Care 902 118 546 Switchboard 91 722 92 00 Fax 91 722 95 83 Web site: http://support.euro.dell.com E-mail: web_esp_tech@dell.com		
Sweden (Upplands Vasby)	Technical Support 08 590 05 199 Relational Customer Care 08 590 05 642 Home/Small Business Customer Care 08 587 70 527 Fax Technical Support 08 590 05 594 Sales 08 590 05 185 Web site: http://support.euro.dell.com E-mail: swe_support@dell.com		

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Switzerland (Geneva)	Technical Support (Home and Small Business)		.0844 811 411
	Technical Support (Corporate)		0844 822 844
	Customer Care (Home and Small Business)		0848 802 202
	Customer Care (Corporate)		0848 821 721
	Fax	022	799 01 90
	Switchboard	022	799 01 01
	Web site: http://support.euro.dell.com E-mail: swisstech@dell.com		
Taiwan	Technical Support		toll free: 0080 60 1255
	Technical Support (servers)		toll free: 0080 60 1256
	Transaction Sales		toll free: 0080 651 228/0800 33 556
	Corporate Sales		toll free: 0080 651 227/0800 33 555
Thailand <i>NOTE: Customers in Thailand call Malaysia for customer assistance.</i>	Technical Support		toll free: 0880 060 07
	Customer Service (Penang, Malaysia)		.633 4949
	Sales		toll free: 0880 060 09
U.K. (Bracknell)	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])		0870 908 0500
	Technical Support (Direct/PAD and General)		0870 908 0800
	Global Accounts Customer Care	01344	723186
	Corporate Customer Care	01344	723185
	Preferred Accounts (500-5000 employees) Customer Care	01344	723196
	Central Government Customer Care	01344	723193
	Local Government Customer Care	01344	723194
	Home/Small Business Sales		0870-907-4000
	Corporate/Public Sector Sales	01344	860456
	Web site: http://support.euro.dell.com E-mail: dell_direct_support@dell.com		

Table 10-2. Dell Contact Numbers (continued)

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
U.S.A. (Austin, Texas)	Automated Order-Status System		toll free: 1-800-433-9014
	AutoTech (for portable and desktop systems)		toll free: 1-800-247-9362
	Home and Small Business Group (for portable and desktop systems):		
	Customer Technical Support (Return Material Authorization Numbers)		toll free: 1-800-624-9896
	Customer Technical Support (Home sales purchased via http://www.dell.com)		toll free: 1-877-576-3355
	Customer Service (Credit Return Authorization Numbers)		toll free: 1-800-624-9897
	National Accounts (systems purchased by established Dell national accounts [have your account number handy], medical institutions, or value-added resellers [VARs]):		
	Customer Service and Technical Support (Return Material Authorization Numbers)		toll free: 1-800-822-8965
	Public Americas International (systems purchased by governmental agencies [local, state, or federal] or educational institutions):		
	Customer Service and Technical Support (Return Material Authorization Numbers)		toll free: 1-800-234-1490
	Dell Sales		toll free: 1-800-289-3355 toll free: 1-800-879-3355
	Spare Parts Sales		toll free: 1-800-357-3355
	DellWare™		toll free: 1-800-753-7201
	Desktop and Portable Fee-Based Technical Support		toll free: 1-800-433-9005
	Server Fee-Based Technical Support		toll free: 1-800-967-0765
	Sales (Catalogs)		toll free: 1-800-426-5150
	Fax		toll free: 1-800-727-8320
	TechFax		toll free: 1-800-950-1329
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired		toll free: 1-877-DELLTTY (1-877-335-5889)
	Switchboard		512338-4400



APPENDIX A

Jumpers and Connectors

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 and switches 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.

Jumpers

Jumpers are small blocks on a circuit board with two or more pins emerging from them. Plastic plugs containing a wire fit down over the pins. The wire connects the pins and creates a circuit. To change a jumper setting, pull the plug off its pin(s) and carefully fit it down onto the pin(s) indicated.

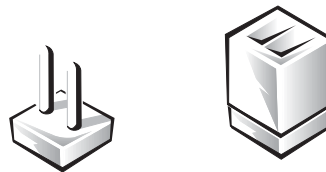


Figure A-1. Jumper

NOTICE: Make sure the system is powered 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.

Figure A-2 shows the location and default settings of the jumper blocks on the system board. See Table A-1 for the designations, default settings, and functions of the system's jumpers.

System Board Jumpers

Figure A-2 shows the location of the configuration jumpers on the system board. Table A-1 lists the function of these jumpers.

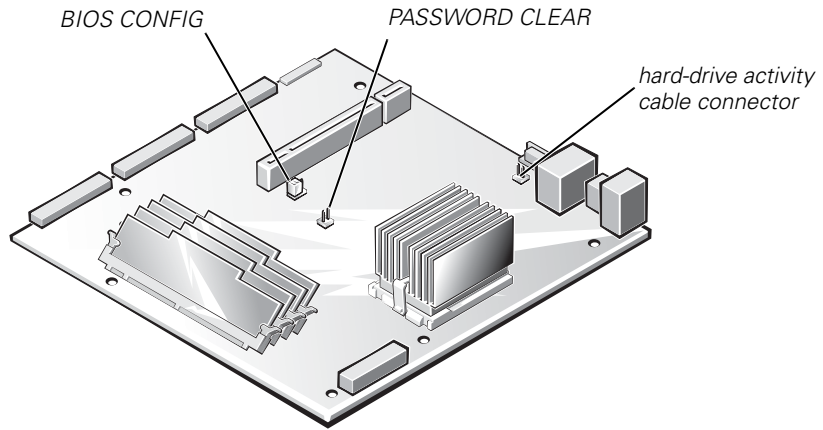








Figure A-2. System Board Jumpers

Table A-1. System-Board Jumper Settings

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

NOTE: For the full name of an abbreviation or acronym used in this table, see "Abbreviations and Acronyms."

System Board Connectors

Table A-2 lists the connectors and sockets located on the system board.

Table A-2. System Board Connectors and Sockets

Connector or Socket	Description
BATTERY	Battery socket
DIMM <i>n</i>	DIMM sockets
FAN <i>n</i>	Power connectors for the fans
FLOPPY	Diskette drive interface connector
FRONT PANEL	Front panel connector
HD FLOPPY	High-density diskette drive connector
IDE SEC	Secondary IDE connector
IDE PRI	Primary IDE connector
J6	Ethernet connector
J7	USB connectors
J20, J13	Riser board sockets
KYB/MSE	Keyboard and Mouse connectors (stacked connector)
POWER CONN	Power connector
SER A	Serial port connector; sometimes referred to as COM1
U15	Microprocessor zero-insertion-force socket

Disabling a Forgotten Password

The system's software security features include a system password and a setup password, which are discussed in detail in "Using the System Setup Program" in the *User's Guide*. A password jumper on the system board enables these password features or disables them and clears any password(s) currently in use.

To disable a forgotten system password or setup password, perform the following steps.

NOTICE: See "Protecting Against Electrostatic Discharge" in the safety instructions in your *System Information* document.

1. Shut down and power off your system. Then disconnect the system and peripherals from their electrical outlets.
2. Remove the system cover.

3. Locate the password jumper (labeled PASSWORD CLEAR) on the system board (see Figure A-2).
4. Place a jumper plug on the PASSWORD CLEAR jumper.
5. Replace the system cover, and then reconnect the system to an electrical outlet and power on.

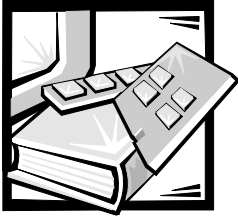
The system password is cleared. Do not set a new system password at this time.



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, 2, and 3.
7. Remove the jumper plug from the PASSWORD CLEAR jumper.
8. Replace the system cover, and then reconnect the system and peripherals to their electrical outlets and power them 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” in the *User’s Guide*. To assign a new user password using the System Setup program, see “Assigning a User Password” in the *User’s Guide*.



Abbreviations and Acronyms

The following list defines or identifies technical terms, abbreviations, and acronyms used in Dell user documents.

A

ampere(s)

AC

alternating current

ACPI

Advanced Configuration and Power Interface

ADC

analog-to-digital converter

ADI

Autodesk Device Interface

AI

artificial intelligence

ANSI

American National Standards Institute

APIC

Advanced Peripheral Interrupt Controller

ASCII

American Standard Code for Information Interchange

ASIC

application-specific integrated circuit

BASIC

Beginner's All-Purpose Symbolic Instruction Code

BBS

bulletin board service

BIOS

basic input/output system

bpi

bits per inch

bps

bits per second

BTU

British thermal unit

C

Celsius

CCFT

cold cathode fluorescent tube

CD

compact disc

CD-ROM

compact disc read-only memory

CGA

color graphics adapter

cm

centimeter(s)

CMOS

complementary metal-oxide semiconductor

C.O.D.

collect on delivery

cpi
characters per inch

cpl
characters per line

CPU
central processing unit

DAC
digital-to-analog converter

DASH
Dell Advanced SCSI Host

DAT
digital audio tape

dB
decibel(s)

dBa
adjusted decibel(s)

DC
direct current

DIMM
dual in-line memory module

DIN
Deutsche Industrie Norm

DIP
dual in-line package

DMA
direct memory access

DOC
Department of Communications (in
Canada)

dpi
dots per inch

DRAC
Dell OpenManage Remote Assistant
Card

DRAM
dynamic random-access memory

DS/DD
double-sided double-density

DS/HD
double-sided high-density

DSA
Dell SCSI Array

ECC
error checking and correction

EDO
extended-data out

EGA
enhanced graphics adapter

EIDE
enhanced integrated drive electronics

EMI
electromagnetic interference

EMM
expanded memory manager

EMS
Expanded Memory Specification

EPP
Enhanced Parallel Port

EPROM
erasable programmable read-only
memory

ESD
electrostatic discharge

ESDI
enhanced small-device interface

ESM
embedded server management

F
Fahrenheit

FAT
file allocation table

FCC
Federal Communications Commission

FIFO

first-in first-out

ft

feet

g

gram(s)

G

gravities

GB

gigabyte(s)

GUI

graphical user interface

h

hexadecimal

HIP

Hardware Instrumentation Package

HMA

high memory area

HPFS

High Performance File System

Hz

hertz

I/O

input/output

ICBM

inter-chassis management bus

ID

identification

IDE

integrated drive electronics

IRQ

interrupt request

ISA

Industry-Standard Architecture

JEIDA

Japanese Electronic Industry Development Association

K

kilo- (1024)

KB

kilobyte(s)

KB/sec

kilobyte(s) per second

Kb

kilobit(s)

Kbps

kilobit(s) per second

kg

kilogram(s)

kHz

kilohertz

LAN

local area network

lb

pound(s)

LCD

liquid crystal display

LED

light-emitting diode

LIF

low insertion force

LN

load number

lpi

lines per inch

LVD

low voltage differential

m

meter(s)

mA

milliampere(s)

mAh

milliampere-hour(s)

MB
megabyte(s)

Mb
megabit(s)

Mbps
megabit(s) per second

MBR
master boot record

MDA
monochrome display adapter

MGA
monochrome graphics adapter

MHz
megahertz

mm
millimeter(s)

ms
millisecond(s)

MTBF
mean time between failures

mV
millivolt(s)

NIC
network interface controller

NiCad
nickel cadmium

NiMH
nickel-metal hydride

NMI
nonmaskable interrupt

NNM
Network Node Manager

ns
nanosecond(s)

NTFS
NT File System

NVRAM
nonvolatile random-access memory

OTP
one-time programmable

PAL
programmable array logic

PCI
Peripheral Component Interconnect

PCMCIA
Personal Computer Memory Card International Association

PGA
pin grid array

POST
power-on self-test

ppm
pages per minute

PQFP
plastic quad flat pack

PSDB
power-supply distribution board

PS/2
Personal System/2

PVC
polyvinyl chloride

QIC
quarter-inch cartridge

RAID
redundant arrays of independent disks

RAM
random-access memory

RAMDAC
random-access memory digital-to-analog converter

RCU
Resource Configuration Utility

REN
ringer equivalence number

RFI
radio frequency interference

RGB
red/green/blue

ROM
read-only memory

rpm
revolutions per minute

RTC
real-time clock

SCA
Single Controller Architecture

SCSI
small computer systems interface

SDS
Scalable Disk System

sec
second(s)

SEC
single-edge contact

SDRAM
synchronous dynamic random-access memory

SIMM
single in-line memory module

SMB
server management bus

SNMP
Simple Network Management Protocol

SRAM
static random-access memory

SSU
system setup utility

SVGA
super video graphics array

TFT
thin film transistor

tpi
tracks per inch

TSR
terminate-and-stay-resident

UMB
upper memory block

UPS
uninterruptible power supply

USOC
Universal Service Ordering Code

V
volt(s)

VAC
volt(s) alternating current

VDC
volt(s) direct current

VESA®
Video Electronics Standards Association

VGA
video graphics array

VLSI
very-large-scale integration

VRAM
video random-access memory

W
watt(s)

WH
watt-hour(s)

X

XMM

extended memory manager

XMS

eXtended Memory Specification

Z

ZIF

zero insertion force



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