



Dell™ PowerEdge™ 1300 Systems Service Manual

[Preface](#)
[System Overview](#)
[Basic Troubleshooting](#)
[Codes and Error Messages](#)
[Removing and Replacing Parts](#)
[Using the System Setup Program](#)
[Abbreviations and Acronyms](#)

Information in this document is subject to change without notice.
© 1999 Dell Computer Corporation. All rights reserved.

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

Trademarks used in this text: *Dell*, the *DELL* logo, *PowerEdge*, and *Dell OpenManage* are trademarks, and *DellWare* is a service mark of Dell Computer Corporation; *Microsoft*, *MS-DOS*, *BackOffice*, and *Windows NT* are registered trademarks of Microsoft Corporation; *Intel* and *Pentium* are registered trademarks of Intel Corporation; *Novell* and *NetWare* are registered trademarks of Novell, Inc; *OS/2* is a registered trademark of International Business Machines Corporation; and *VESA* is a registered trademark of Video Electronics Standards Association.

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

Model MMP

Initial release: 20 Jan 1999

Preface: Dell™ PowerEdge™ 1300 Systems Service Manual

[Read This First](#) • [Notes, Cautions, and Warnings](#)

Read This First

A prerequisite for using this manual to service Dell computer systems is a basic knowledge of IBM® - compatible PCs and prior training in IBM-compatible PC troubleshooting techniques. In addition to information provided in this manual and in the *Dell PowerEdge 1300 Systems User's Guide* that came with the system, Dell provides the *Dell PowerEdge 1300 Systems Installation and Troubleshooting Guide* for troubleshooting procedures and instructions on using Dell Diagnostics to test the computer system.

Notes, Cautions, and Warnings

Throughout this manual, there may be blocks of text printed in bold type or in italic type. These blocks are notes, cautions, and warnings and they are used as follows:



NOTE: A NOTE provides helpful information about using the computer system.



CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and provides instructions for how to avoid the problem.



WARNING: A WARNING indicates the potential for bodily harm and provides instructions for how to avoid the problem.

System Overview: Dell™ PowerEdge™ 1300 Systems Service Manual

[Overview](#) • [System Features](#) • [System Memory](#) • [Advanced Expansion Subsystems](#) • [System Power Supply](#) • [System Board](#) • [Technical Specifications](#)

Overview

Dell PowerEdge 1300 systems are high-speed, upgradable servers with Intel® Pentium® II microprocessors. These systems support the high-performance PCI bus; each system also supports ISA design with one ISA slot that allows you to configure the computer system to your initial requirements and then upgrade it as necessary.

System Features

The PowerEdge 1300 system offers the following features:

- Single or dual Intel Pentium II microprocessor(s) with an internal speed of 350, 400, or 450 MHz and an external speed of 100 MHz, and an integrated 512 KB L2 SDRAM cache with ECC capability. SMP is supported when a second Pentium II microprocessor is installed. An SMP-supporting operating system is required to use SMP capabilities.



NOTE: When installing a second microprocessor, you must order the microprocessor upgrade kit from Dell. Not all versions of the Pentium II microprocessor will work properly as additional microprocessors.

- Support for SMART technology and hard-disk drives.
- Plug and Play BIOS. RCU is used to configure ISA cards.
- USB ports for serial devices. USB ports must be supported by the operating system. Currently, mice and keyboards are not supported.



CAUTION: Do not attach a USB device or a combination of USB devices that draw a maximum current over 500 mA per channel or +5 V. Attaching devices that exceed this threshold may cause the USB ports to shut down. See the documentation that accompanied the USB devices for their maximum current ratings.

- SDRAM DIMMs. Memory is upgradable to 1 GB.
- BIOS in upgradable flash memory on the ISA bus.

The system board includes the following integrated features:

- Six 32-bit PCI expansion slots, including one that is a shared PCI (32-bit) /ISA (16-bit) expansion slot
- ATI RAGE IIC AGP video controller with 2 MB of SGRAM
- Integrated server management circuitry that works in conjunction with HP OpenView NNM SE and Dell HIP software
- Diskette drive interface to support a 3.5-inch diskette drive
- EIDE controller for EIDE CD-ROM drive

SCSI support via an integrated Adaptec 7890 Ultra2/Wide LVD channel

- Two high-performance serial ports and one bi-directional parallel port
- PS/2-style keyboard port and a PS/2-compatible mouse port

The following network operating systems are supported on PowerEdge 1300 systems:

- Microsoft® Windows NT® Server 4.0
- Novell® IntranetWare 4.11 and NetWare® 5.0
- Microsoft BackOffice® Small Business Server (SBS) 4.x

Within this document, assume the locations or direction relative to the computer is as shown in Figure 1, Orientation.

Figure 1. Orientation

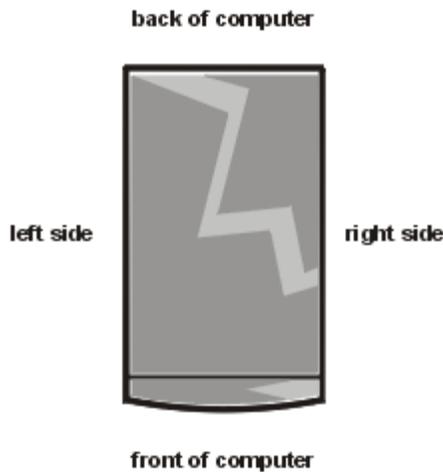
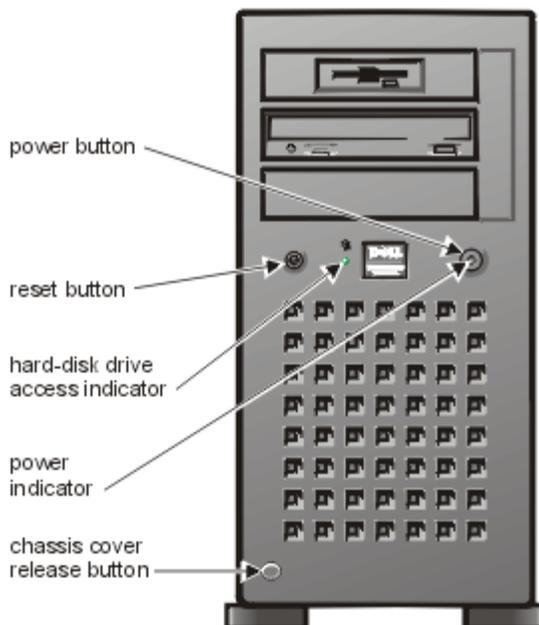


Figure 2, Front Panel, shows the location of the key front-panel features.

Figure 2. Front Panel



Figures 3 and 4 show the locations of the key back-panel features.

Figure 3. Back Panel

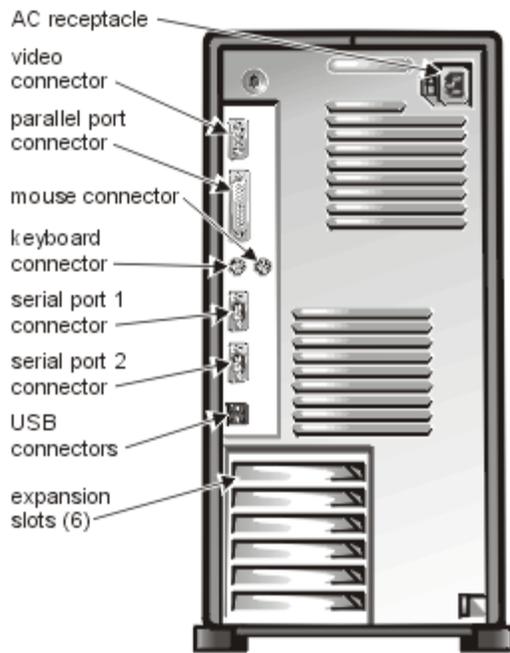


Figure 4. Security Cable Slot and Padlock Ring

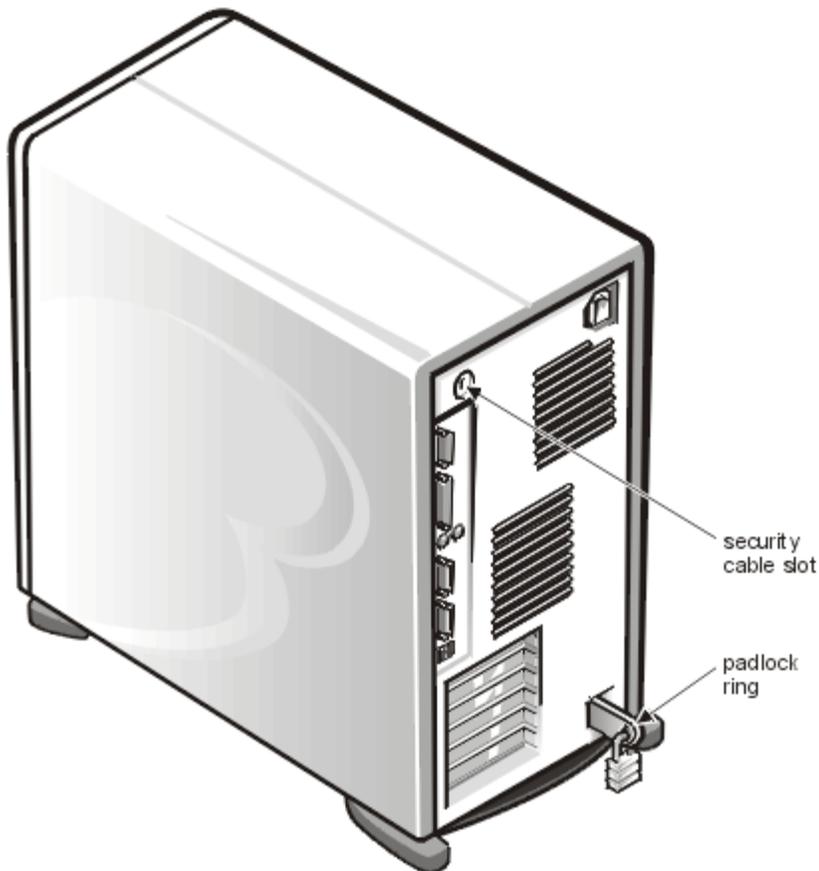
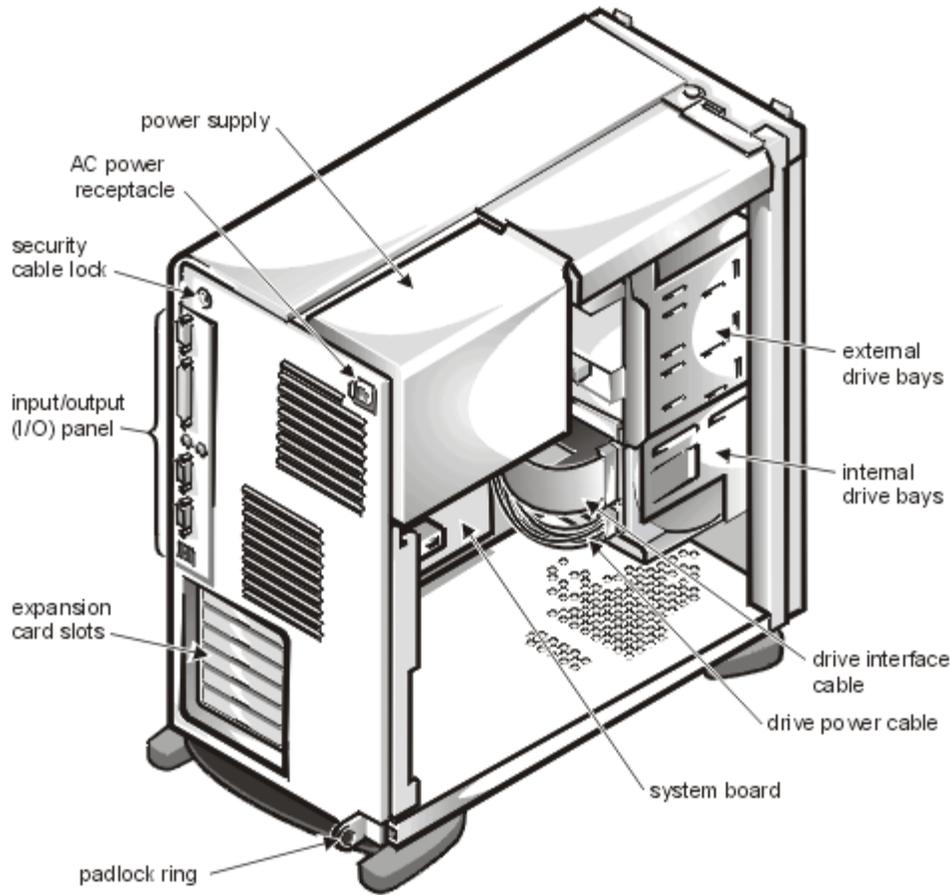


Figure 5, Inside the Chassis, shows some of the key features of the PowerEdge 1300's internal components.

The procedure to remove the cover to access interior components is described in [Removing the Computer Cover](#).

Figure 5. Inside the Chassis



System Memory

System memory has a minimum of 64 MB of 72-bit unbuffered memory. The system memory capacity can be expanded up to 1 GB by using combinations of 64-, 128-, and/or 256-MB unbuffered or registered SDRAM DIMMs. Maximum capacity using unbuffered SDRAM DIMMs is 512 MB. Maximum capacity using registered SDRAM DIMMs is 1 GB.

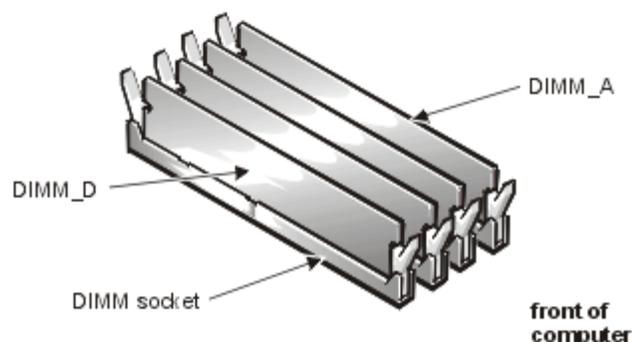
 **NOTE:** DIMMs must be rated to run at 100 MHz.

The system board has four, 168-pin DIMM sockets. The DIMMs do not have to be inserted in pairs. The socket population guidelines are as follows:

- Populate the DIMM sockets in order from DIMM_A (right) to DIMM_D (left).
- The largest-capacity DIMM should be in socket DIMM_A, with smaller-capacity DIMMs installed in decreasing sized toward socket DIMM_D.
- Unbuffered and registered SDRAM DIMMs cannot be mixed in the system. Remove any 64- or 128-MB unbuffered DIMMs before installing 256-MB registered DIMMs.
- DIMMs support the ECC feature, which detects memory errors and corrects single-bit memory errors. The ECC feature is built into the memory controller on the system board.

Figure 6, DIMM Sockets, shows an isolated view of the DIMM sockets on the system board (see the [system board illustration](#)).

Figure 6. DIMM Sockets



For more detailed information about DIMM installation guidelines and samples of DIMM configurations, see "Installing System Board Options" in the *Installation and Troubleshooting Guide*.

For information on removing and replacing DIMMs, refer to [DIMM Removal and Installation](#).

Advanced Expansion Subsystems

The computer system offers advanced expansion subsystems that can support a mixture of traditional ISA expansion cards, Plug and Play ISA expansion cards, and PCI expansion cards. The RCU (included with the system) provides a means of avoiding resource conflicts that might arise from such an arrangement. See the *User's Guide* for information about using the RCU.

After all legacy cards have been configured with the RCU, the system automatically assigns any required memory space, IRQ lines, and DMA channels to any installed Plug and Play ISA expansion cards and PCI expansion cards the next time the system is rebooted. "Using the Resource Configuration Utility," in the *User's Guide* describes the RCU and provides instructions for using it to configure the system.

There are seven expansion-card connectors on the system board. Expansion-card connectors PCI1 through PCI6 support 32-bit PCI expansion cards; expansion-card connector ISA6 can accommodate an 8- or 16-bit ISA expansion card. The PCI1 slot is limited to a half-length card. See [Expansion Card](#) for more information.



NOTES: Connector ISA6 shares expansion-card slot space with connector PCI6. Therefore, only one card of either type can be installed in this slot.

PCI4 has an in-line connector to support a DRAC card (the SVR_MGT connector on the system board).

Video Controller

The video subsystem is built into the system board and consists of an AGP VGA-compatible video subsystem with an ATI RAGE IIC video controller. The video subsystem contains 2 MB of SGRAM (non-upgradable), allowing resolutions up to 1024 x 768 x 256.

Integrated SCSI Controllers

An integrated AIC-7890 Ultra 2/Wide LVD SCSI-3 controller on the system board supports up to two 1.6-inch and two 1-inch, or up to four 1-inch internal SCSI hard-disk drives in the system's removable drive cage. Up to three additional SCSI devices can be installed in the 5.25-inch external drive bays.

The AIC-7890 host adapter and the optional AHA-2940U2W host adapter are part of the Adaptec 78xx series of SCSI controllers and use the 78xx series of SCSI device drivers provided by Dell. The Adaptec SCSI BIOS, which is stored in the computer system's flash memory or on the AHA-2940U2W SCSI controller card, links these SCSI device drivers to the AIC-7890 controller chip or the optional AHA-2940U2W SCSI controller card.

If you are using an optional Dell PowerEdge Expandable RAID Controller (PERC SC/2), the corresponding SCSI device drivers are installed at the same time as the SCSI device drivers for the AIC-7890 and AHA-2940U2W host adapters. Refer to your Dell RAID controller documentation for information on installing your SCSI device drivers. The *User's Guide* provides instructions for configuring the SCSI device drivers for your RAID controllers.

For instructions on installing SCSI hardware devices such as hard-disk drives, tape drives, or CD-ROM drives, refer to "Installing Drives in the External Bays" and "Installing Hard-Disk Drives" in the *Installation and Troubleshooting Guide*. After the SCSI devices are installed, you may need to install and configure one or more SCSI device drivers so that your SCSI devices can communicate with your operating system.

SCSI Configuration Guidelines

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

SCSI ID Numbers

Internal SCSI devices attached to the integrated Adaptec 7890 Ultra2/Wide low-voltage differential (LVD) controller through the 68-pin primary SCSI connector on the system board must have a unique SCSI ID number from 0 to 15.

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

- The integrated 7890 Ultra2/Wide LVD SCSI controller is configured through the computer's BIOS as SCSI ID 7.
- The first internal SCSI hard-disk drive is configured as SCSI ID 0. (The drive used to boot your system should always be configured as SCSI ID 0.)
- A SCSI tape drive attached to the 7890 Ultra2/Wide LVD integrated controller or the 2940U2W controller card is normally configured as SCSI ID 6, but can be configured to any unused SCSI ID.



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

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

If you attach additional optional SCSI devices, refer to the documentation that came with each device for

information about setting the appropriate SCSI ID number.



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

Device Termination

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

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

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

SCSI Cables

The 68-pin (internal) SCSI cable in your system connects SCSI devices (normally SCSI hard-disk drives) to the integrated 7890 Ultra2/Wide LVD controller.

- The connector at the end of the cable attaches to the Ultra2/Wide LVD primary SCSI controller connector labeled "SCSI_ULTRA2" on the system board.
- The other connectors on the cable are used for attaching up to four SCSI hard-disk drives in the internal drive bays. When the integrated SCSI controller is not being used for hard-disk drives, it can be attached to a SCSI tape drive.

Refer to the documentation that came with the external SCSI device for information on how to connect the device, set its SCSI ID, and disable termination. Refer to the *User's Guide* for detailed information pertaining to cabling, formatting, and partitioning SCSI devices.

System Power Supply

The Dell PowerEdge 1300 provides one 330 W system power supply that operates from an AC power source of 115 VAC at 60 Hz or 230 VAC at 50 Hz. The system power supply provides the DC operating voltages and currents listed in Table 1, DC Voltage Ranges.



NOTE: The power supply produces DC voltages only under its loaded condition. Therefore, when you measure these voltages, the DC power connectors must be connected to their corresponding power input connectors on the system board or drives.

Table 1. DC Voltage Ranges

Voltage	Range	Maximum Output Current ¹
+3.3 VDC	+3.15 to +3.45 VDC	18.0 A

+5 VDC	+4.75 to +5.25 VDC	35.0 A
+12 VDC	+11.40 to + 12.60 VDC	14.0 A
-12 VDC	-10.80 to -13.20 VDC	0.3 A
-5 VDC	-4.50 to -5.50 VDC	0.3 A
+5 VFP ²	+4.75 to +5.25 VDC	1.2 A

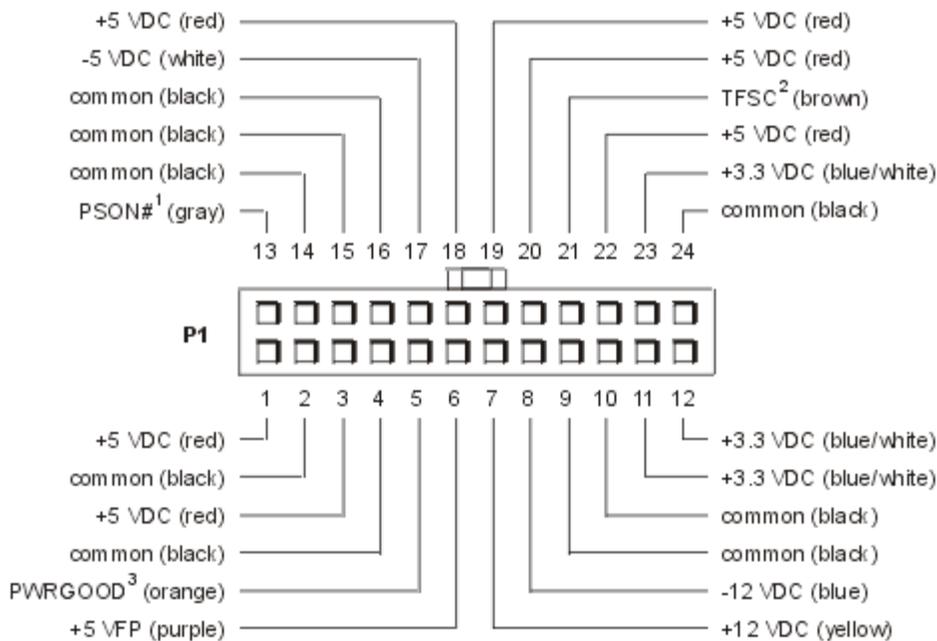
¹ Maximum continuous DC output power should not exceed 330 W. Maximum combined load on +5 VDC and +3.3 VDC cannot exceed 230 W.

² VFP (volts flea power) — sometimes called "standby power."

Pin Assignments for the DC Power Connectors

The power-supply output voltages can be measured at the back (wire side) of the connectors without disconnecting them. Figures 7, 8, and 9 show the wire side of the connectors.

Figure 7. DC Power Connector P1



¹ Pin 13 — PSON# should measure between +4 and +5 VDC except when the power button on the front panel is pressed, taking PSON# to its active-low state.

² Pin 21 — Thermal fan-speed control (TFSC) is a power-supply input signal used to control the power supply fan speed in special applications.

³ Pin 5 — PWRGOOD should measure between +4 and +5 VDC when the power supply is operating to indicate that all power supply output voltages are within the ranges specified in [Table 1, DC Voltage Ranges](#).

Figure 8. DC Power Connectors P3, P4, P5, and P6

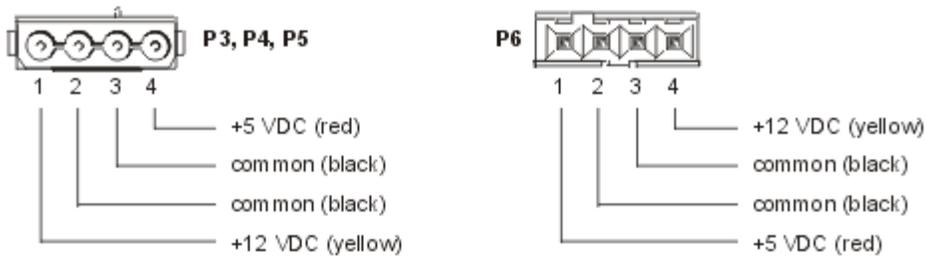
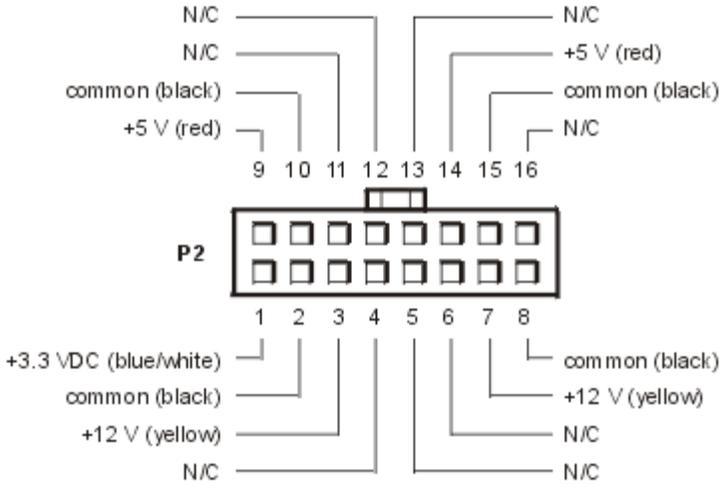


Figure 9. DC Power Connector P2



DC Power Distribution

Figure 10, DC Power Cables and Figure 11, [Power Distribution](#) provide the following information about DC power distribution:

- Power-supply connector identification
- Power cable connections for diskette, tape, CD-ROM, and hard-disk drives
- Power distribution to sockets and connectors on the system board

Figure 10. DC Power Cables

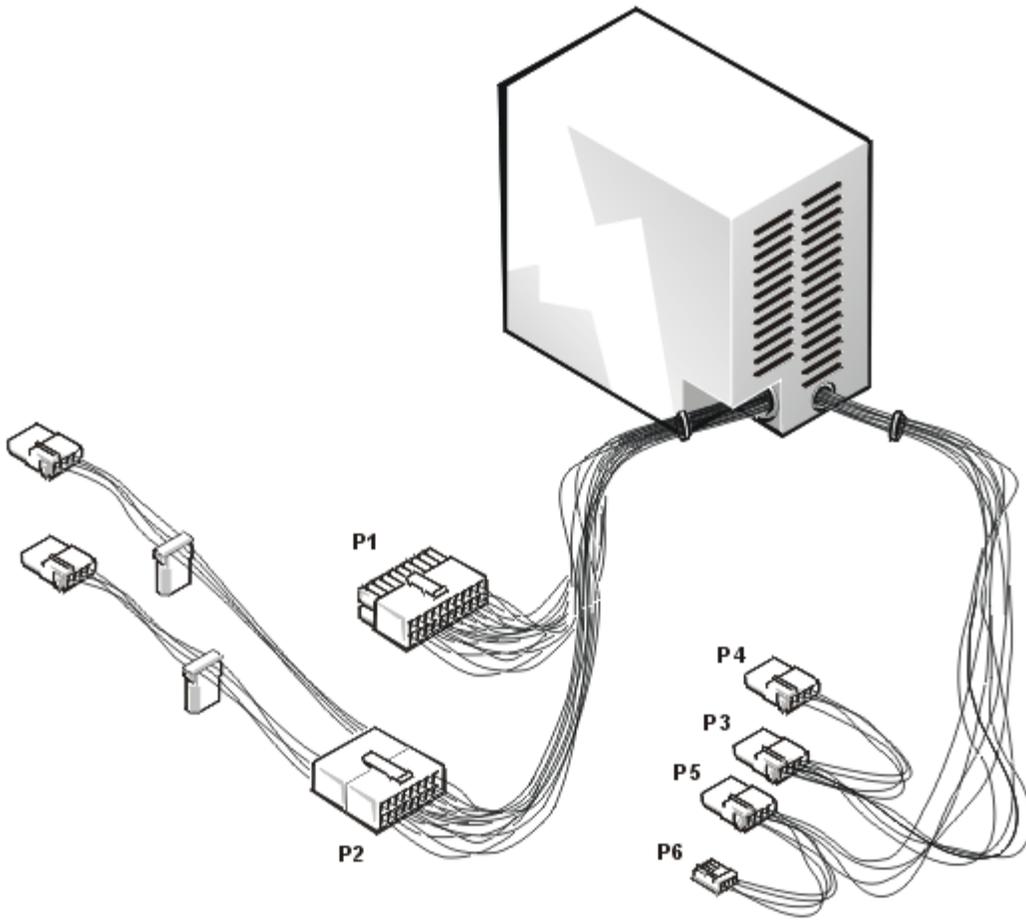
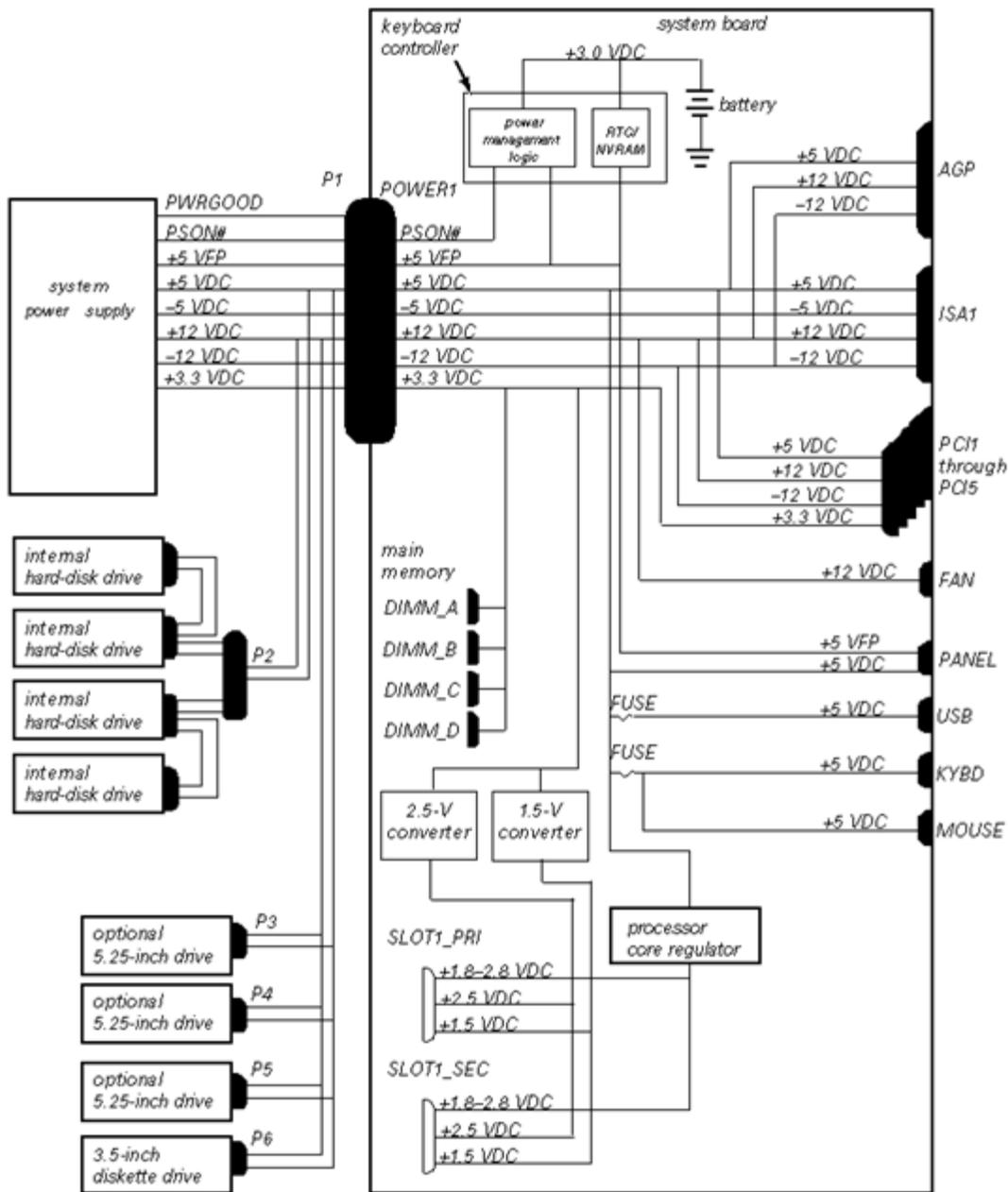


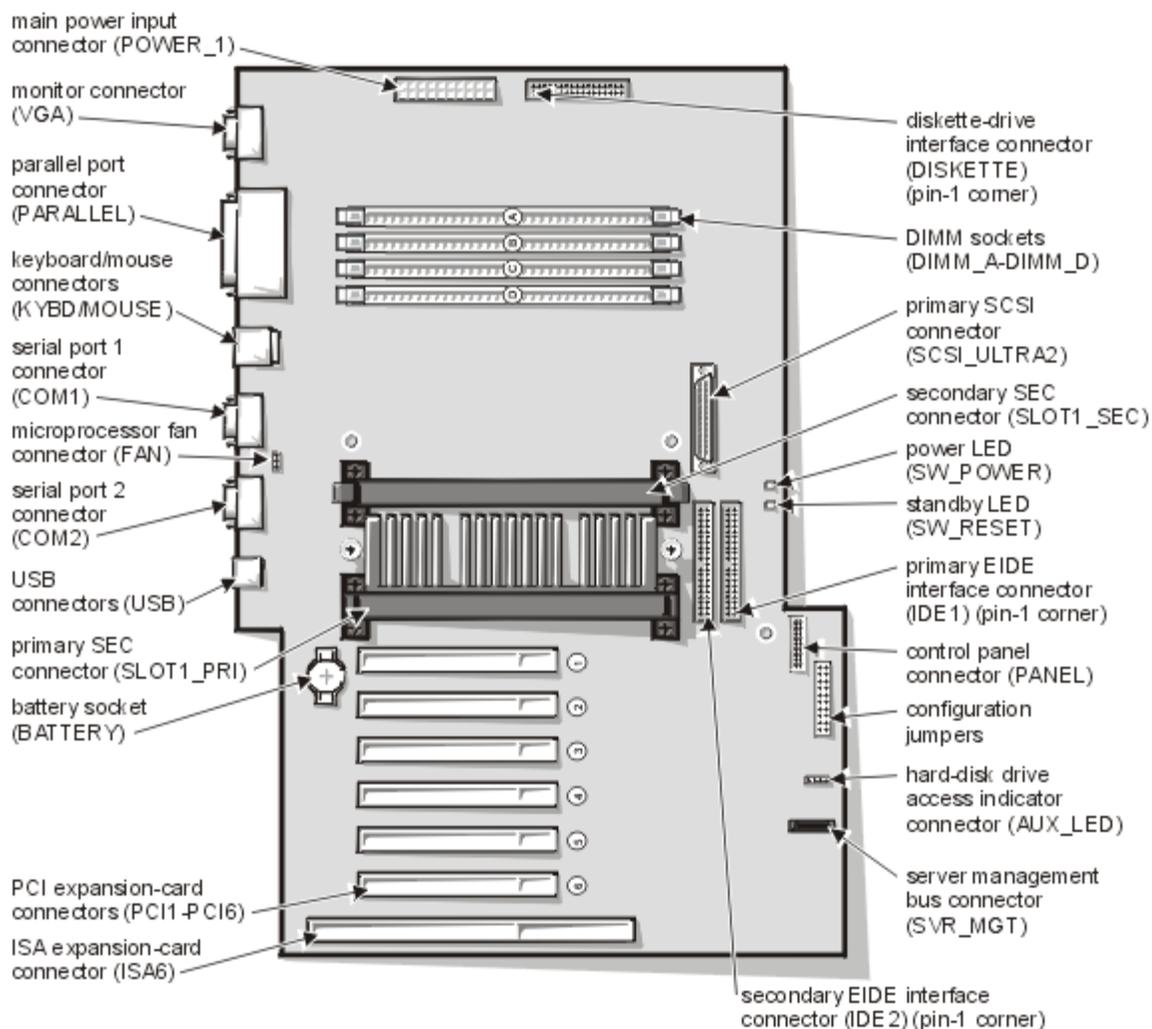
Figure 11. Power Distribution



System Board

Figure 12, System Board, illustrates the location of important system board components. The subsections that follow provide service-related information about the system board components.

Figure 12. System Board



System Board Jumpers

Figure 13, System Board Jumpers, illustrates the location of the system board jumpers. [Table 2](#), Jumper Descriptions, lists and describes the jumper settings.

Figure 13. System Board Jumpers

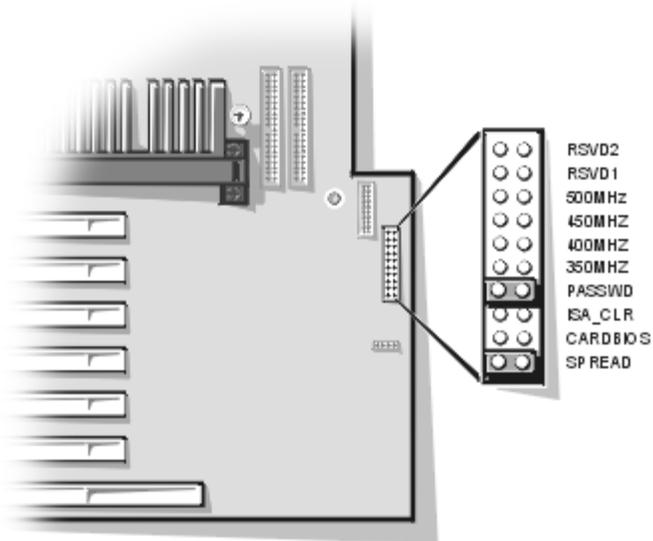


Table 2. Jumper Descriptions

Jumper	Setting	Description
SPREAD		Reserved (do not remove jumper plug).
CARDBIOS		Reserved (do not install jumper plug).
ISA_CLR	 (default) 	<p>The ISA configuration settings are retained at system boot.</p> <p>The ISA configuration settings are cleared at next system boot. (If the ISA configuration settings become corrupted to the point where the system won't boot, install the jumper plug and boot the system. Remove the jumper before restoring the ISA configuration information.)</p>
PASSWD	 (default) 	<p>The password feature is enabled.</p> <p>The password feature is disabled.</p>
350MHZ*		Jumpered when the microprocessor's internal speed is 350 MHz.
400MHZ*		Jumpered when the microprocessor's internal speed is 400 MHz.
450MHZ*		Jumpered when the microprocessor's internal speed is 450 MHz.
500MHZ		Reserved (do not install jumper plug).
RSVD1		Reserved (do not install jumper plug).

RSVD2	 (default)	Reserved (do not install jumper plug).
<p><i>*One set of the speed jumper pins must have a jumper plug installed; otherwise, the system will operate at an undetermined speed.</i></p> <p> jumpered  unjumpered</p>		

Interrupt Assignments

Table 3, IRQ Assignments, lists the default interrupt request assignments.

Table 3. IRQ Assignments

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 1 to enable IRQ8 through IRQ15
IRQ3	Used by serial port 2 (COM2 and COM4)
IRQ4	Used by serial port 1 (COM1 and COM3)
IRQ5	Available unless used by a secondary parallel port
IRQ6	Used by the diskette drive controller
IRQ7	Used by the primary parallel port
IRQ8	Used by the RTC
IRQ9	Used for power management functions
IRQ10	Available
IRQ11	Available
IRQ12	Used by the PS/2 mouse port unless the mouse is disabled in the System Setup program
IRQ13	Used by the math coprocessor
IRQ14	Available
IRQ15	Used by the EIDE CD-ROM

Direct Memory Access Channel Assignments

Table 4, DMA Channel Assignments, lists the direct memory address channel assignments.

Table 4. DMA Channel Assignments

DREQ Line	Used By/Available
DREQ0	Available

DREQ1	Available
DREQ2	Generated by super I/O controller to initiate DMA cycle for attached diskette drive
DREQ3	Available
DREQ4	Generated by bus controller chip to activate second DMA controller
DREQ5	Available
DREQ6	Available
DREQ7	Available

Technical Specifications

Table 5, Technical Specifications, provides the technical specifications for the Dell PowerEdge 1300 systems.

Table 5. Technical Specifications

Microprocessor	
Microprocessor type	Intel® Pentium II® microprocessor that runs at 350, 400, or 450 MHz internally and 100 MHz externally.
Internal cache	32-KB (16-KB data cache; 16-KB instruction cache)
L2 cache	512-KB pipelined burst, four-way set-associative, write-back ECC SRAM on each SEC cartridge
Math coprocessor	Internal to the microprocessor
System Information	
System chip set	Intel 440BX PCI chip set
Data bus width	64 bits
Address bus width	32 bits
DMA channels	seven
Interrupt levels	15
System BIOS chip	4 Mb
Primary SCSI controller	Adaptec 7890 Ultra2/Wide LVD (Adaptec 2940 U2W-equivalent)
I/O controller	National PC 87309

Expansion Bus

Bus types	PCI and ISA
Bus speed	PCI: 33.3 MHz ISA: 8.33 MHz
PCI expansion-card connectors	six (one of the PCI connectors shares a card-slot opening with the ISA connector)
ISA expansion-card connectors	one (the ISA connector shares a card-slot opening with one of the PCI connectors)
PCI expansion-card connector size	120 pins
PCI expansion-card connector data width (maximum)	32 bits
ISA expansion-card connector size	98 pins
ISA expansion-card connector data width (maximum)	16 bits

System Clocks

System clock	100 MHz
SDRAM memory clock	100 MHz
I/O APIC clock	14 MHz
Diskette/communications ports	48 MHz
USB clock	48 MHz

Memory

Architecture	72-bit ECC SDRAM
DIMM sockets	four
DIMM capacities	64- and 128-MB unbuffered, 72-bit SDRAM; 256-MB registered, 72-bit SDRAM
Standard RAM	64 MB
Maximum RAM	1 GB
BIOS address	F000:0000h-F000:FFFFh

Drives

Externally accessible bays	three 5.25-inch bays accommodate one 3.5-inch diskette drive (standard), one IDE CD-ROM drive (optional) and one other optional 5.25-inch peripheral.
Internally accessible bays	removable drive cage accommodates up to two 1.6 and two 1-inch SCSI hard-disk drives, or up to four 1-inch SCSI hard-disk drives. Alternatively, the system supports up to two IDE hard-disk drives.

Ports and Connectors

Externally accessible:

Serial (DTE)	two 9-pin connectors; 16550-compatible
Parallel	one 25-pin connector (bi-directional)
Video	one 15-pin connector
PS/2-style keyboard	6-pin mini-DIN connector
PS/2-compatible mouse	6-pin mini-DIN connector
USB	two USB-compliant 4-pin connectors

Internally accessible:

EIDE drive	two 40-pin connectors on PCI local bus
SCSI channel	one 68-pin Ultra2/Wide SCSI connector
Diskette drive	one 34-pin connector
Fan	3-pin connector

Control panel connectors:

Thermal sensor	3-pin connector
Chassis intrusion	2-pin connector

Video

Video type	ATI RAGE IIC AGP integrated video controller
------------	--

Key Combinations

<Ctrl><Alt>	restarts (reboots) the system
<F2>	starts System Setup program (during POST only)

Controls and Indicators

Reset control	push button
Power control	push button
Power indicator/sleep mode indicator	green LED (indicates power) amber LED (indicates sleep mode)
Hard-disk drive access indicator	green LED
Power indicator (on system board)	green LED
Standby power indicator (on system board)	green LED

Power

DC power supply:

Wattage	330 W
Heat dissipation	600 BTU/hr (nominal)
Voltage	90 to 135 V at 60 Hz; 180 to 265 V at 50 Hz Autoranging 90 to 265 V
Backup battery	3-V CR2032 coin cell

Physical

Height	45.9 cm (18.1 inches)
Width	21.6 cm (8.5 inches)
Depth	43.6 cm (17.6 inches)
Weight	16.0 kg (37.0 lb) or more, depending on options installed

Environmental

Temperature:

Operating	10° to 35°C* (50° to 95°F)
Storage	-40° to 65°C (-40° to 149°F)
Relative humidity	20% to 80% (noncondensing)

Maximum vibration:

Operating	0.25 G at 3 to 200 Hz for 30 min
Storage	0.5 G at 3 to 200 Hz for 30 min

Maximum shock:	
Operating	half-sine wave form: 50 G for 2 ms
Storage	half-sine wave form: 110 G for 2 ms square wave form: 27 G for 15 ms
Altitude:	
Operating	-16 to 3048 m* (-50 to 10,000 ft)
Storage	-16 to 10,600 m (-50 to 35,000 ft)
* At 35°C (95°F), the maximum operating altitude is 914 m (3000 ft).	

[Back to Contents Page](#)

Basic Troubleshooting: Dell™ PowerEdge™ 1300 Systems Service Manual

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

Overview

This file describes basic troubleshooting procedures that can help you diagnose a computer system problem. These procedures can often reveal the source of a problem or indicate the correct starting point for troubleshooting the system. For a brief explanation of how to load and start the system diagnostics, see [Running the Dell Diagnostics](#). Dell recommends that you perform the following procedures in the order presented.

Initial User Contact

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

1. Ask the user to back up any data on the hard-disk drive if the system's condition permits. See "Maintaining the System" in the *Dell PowerEdge 1300 Systems User's Guide* for information about backing up data.
2. Ask the user to try to duplicate the problem by repeating the operations he or she was performing at the time the problem occurred.

Can the user duplicate the problem?

Yes. Proceed to step 3.

No. Proceed to the next section, [External Visual Inspection](#).

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

Is the problem a result of user error?

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

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

External Visual Inspection

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

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

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

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

4. Verify that network cables (if present) are properly attached.
5. Verify that any devices attached to the serial and parallel port connectors are properly connected.
Each of the serial and parallel port interface cables must be firmly attached to an appropriate connector on the back of the computer as well as to the interface connector on the device. The captive screws that secure these connectors at each end of the interface cable must be secure enough to ensure a firm connection.
6. Verify that the video interface cable is firmly attached to the video connector on the back panel or to a video expansion card, and also to the connector on the back of the monitor. For proper connection of the video monitor, see the documentation for the monitor.
7. Inspect all external monitor controls for any obvious damage or improper settings. For proper settings of the video monitor controls, see the documentation for the monitor.
8. Inspect the keyboard to ensure that no keys are sticking. If one or more keys are sticking, it may be necessary to replace the keyboard.
9. Inspect the exterior of the computer, including all controls and indicators, and all user-accessible data storage devices for any signs of physical damage.

Does the inspection reveal any problems?

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

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

Observing the Boot Routine

After you have performed an external visual inspection as described in the previous section, you should boot the system and, while the boot routine is running, observe the system for any indications of problems.



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

To perform the following procedure, you need a *Dell Diagnostics Diskette* created from the *Dell OpenManage™ Server Assistant* CD. If such a diskette is not available, you can create it as described in "Using the Dell OpenManage Server Assistant CD," in the *Dell PowerEdge 1300 Systems User's Guide*. If a separate diagnostics diskette is included with the system, you may need to use that diskette.

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

1. If the system is off, turn on all peripherals and the computer. Insert the *Dell Diagnostics Diskette* into the diskette drive and reboot the system.
2. Check power supply fan.

Does the fan run normally?

Yes. Proceed to step 3.

No. Troubleshoot the system power supply.

3. Watch the <Num Lock>, <Caps Lock>, and <Scroll Lock> indicators on the upper-right corner of the keyboard. After all three indicators flash momentarily, and following a long pause (approximately 30 seconds), the Num Lock indicator should light up and remain on (unless the **Num Lock** option is set to **Off** in the System Setup program).

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

Yes. Proceed to step 4.

No. Troubleshoot the system power supply. If the troubleshooting procedure indicates that the system power supply is operational, troubleshoot the memory.

4. During the boot routine, observe the system for any of the following indications:

- Beep codes — A beep code is a series of beeps that indicates an error condition. See [POST Beep Codes](#).
- System error messages — These messages can indicate problems or provide status information. If a system error message is displayed, see [System Error Messages](#).
- Diskette-drive and hard-disk drive access indicators — These indicators light up in response to data being transferred to or from the drives. If either of these indicators fails to light up during the boot routine, troubleshoot the diskette drive or hard-disk drive subsystem, as appropriate.

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

Does the **Diagnostics** menu appear?

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

No. Proceed to step 6.

6. Insert another copy of the *Dell Diagnostics Diskette* into the diskette drive, and reboot the system.

Does the **Diagnostics** menu appear?

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

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

Internal Visual Inspection



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

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

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

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



WARNING: Before beginning to work inside the computer, disconnect the power supply from the power source and the power supply cables from the power supply.

2. Remove the computer's right side cover as described in [Removing the Computer Cover](#).

 **WARNING:** The SEC cartridge and heat sink assembly can get extremely hot during system operations. Be sure that it has had sufficient time to cool before touching it.

 **WARNING:** When handling the SEC cartridge and heat sink assembly, take care to avoid sharp edges on the heat sink.

3. Verify that the chips, DIMMs, expansion cards, and SEC cartridge and heat sink assembly or assemblies are fully seated in their sockets or connectors.

To ensure that the chips are fully seated in their sockets, press firmly on the top of each chip.

To reseat an SEC cartridge and heat sink assembly, remove and reinstall it as described in [Microprocessor SEC Cartridge/Heat Sink Assembly](#).

To reseat a DIMM, remove it from its socket and reinstall it as described in [DIMM Removal/Installation](#).

If you need to reseat an expansion card, remove the card as described in [Expansion Cards](#), and then reinsert the card in its connector and carefully push it in until fully seated.

4. Verify that all jumpers are set correctly.

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

5. Check all cable connectors inside the computer to verify that they are firmly attached to their appropriate connectors.
6. Reinstall the computer cover.
7. Reconnect the computer and any attached peripherals to their power sources, and turn them on.

Does the problem appear to be resolved?

Yes. No further steps are necessary.

No. Proceed to [Eliminating Resource Conflicts](#) and to [Getting Help](#).

Eliminating Resource Conflicts

Devices within the computer may require dedicated memory spaces, interrupt levels, or DMA channels, all of which must be allocated during installation of the devices. Because devices may be installed at different times, it is possible that the same resource is assigned to two or more devices.

Resource conflicts can result in disorderly or erratic system operation or system failure. If you suspect that resource conflicts might exist, check the system and reassign the resources as necessary.

For additional information, see "Using the Resource Configuration Utility" in the *Dell PowerEdge 1300 Systems User's Guide* or [Interrupt Assignments](#) and [Direct Memory Access Channel Assignments](#).

Running the Dell Diagnostics

The Dell Diagnostics contains tests that aid in troubleshooting all major components of the computer system. To run the tests, you must first create the *Dell Diagnostics Diskette* using the *Dell OpenManage Server Assistant* CD as described in "Using the Dell OpenManage Server Assistant CD," in the *User's Guide*. If a separate *Dell Diagnostics Diskette* is included with the system, you may need to use that diskette.

To start the Dell Diagnostics, turn off the system, insert the *Dell Diagnostics Diskette* into the diskette drive, and then turn on the system.

Starting the diagnostics causes the Dell logo screen to appear on the monitor, followed by a message indicating that the diagnostics is loading. Before the diagnostics loads, a program tests the portion of main memory (RAM) required for loading the diagnostics. If a RAM error is detected, a message telling you which DIMM has failed appears on the screen.

If no errors are found in RAM, the diagnostics loads and the **Diagnostics** menu appears. This menu lets you choose the following options or exit the Dell Diagnostics:

- **Run All Tests** — Runs all tests for a thorough check of the system
- **Run Quick Tests** — Runs selected tests from all test groups to quickly locate a failure or to indicate where further testing is needed to isolate a failure
- **Run Specific Tests** — Tests a particular area or subsystem

See "Running Dell Diagnostics" in the *Dell PowerEdge 1300 Systems Installation and Troubleshooting Guide* for specific information about the Dell Diagnostics.

Getting Help

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

[Back to Contents Page](#)

Codes and Messages: Dell™ PowerEdge™ 1300 Systems Service Manual

[Overview](#) • [POST Beep Codes](#) • [System Error Messages](#) • [Alert Messages From Dell OpenManage™ HIP](#)

Overview

This file describes beep codes and system error messages that can occur during system start-up or, in the case of some failures, during normal system operation. The tables in this file list faults that can cause a beep code or system error message to occur and the probable causes of the fault in each case.

If a faulty system does not emit beep codes or display system error messages to indicate a failure, you should run the appropriate tests in the Dell Diagnostics to help isolate the source of the problem. See "Running the Dell Diagnostics" in the *Dell PowerEdge 1300 Systems Installation and Troubleshooting Guide*.

POST Beep Codes

If the monitor cannot display error messages during the POST, the system may emit a series of beeps that identifies the problem or that can help you identify a faulty component or assembly. [Table 1](#) lists the beep codes that may be generated during the POST. Most beep codes indicate an error that may prevent the system from completing the boot routine until the indicated condition is corrected. If the table does not lead to the source of the problem, run the appropriate tests in the Dell Diagnostics (see the *Dell PowerEdge 1300 Installation and Troubleshooting Guide*) to assist in troubleshooting the problem.

Table 1. POST Beep Codes

Beep Code	Error	Corrective Action
1-1-3	NVRAM write/read failure	Replace the system board.
1-1-4	BIOS checksum failure	Reflash the BIOS firmware. If the problem persists, replace the system board.
1-2-1	Programmable interval-timer failure	Replace the system board.
1-2-2	DMA initialization failure	
1-2-3	DMA page register write/read failure	
1-3-1	Main-memory refresh verification failure	Remove and reseal the DIMMs. If the problem persists, replace the DIMMs. If the problem still persists, replace the system board.
1-3-2	No 100-MHz DIMM installed	

1-3-3	Chip or data line failure in the first 64 KB of main memory	
1-3-4	Odd/even logic failure in the first 64 KB of main memory	
1-4-1	Address line failure in the first 64 KB of main memory	
1-4-2	Parity failure in the first 64 KB of main memory	
2-1-1 through 2-4-4	Bit failure in the first 64 KB of main memory	
3-1-1	Slave DMA-register failure	Replace the system board.
3-1-2	Master DMA-register failure	
3-1-3	Master interrupt-mask register failure	
3-1-4	Slave interrupt-mask register failure	
3-2-4	Keyboard-controller test failure	Check the keyboard cable and connector for proper connection. If the problem persists, replace the system board.
3-3-4	Screen memory test	Faulty video subsystem (defective graphics adapter card). Run the Video test group in the Dell Diagnostics.
3-4-1	Screen initialization failure	
3-4-2	Screen re-trace test failure	
3-4-3	Search for video ROM failure	
4-2-1	No timer tick	Replace the system board.
4-2-2	Shutdown failure	
4-2-3	Gate A20 failure	
4-2-4	Unexpected interrupt in protected mode	Ensure that all expansion cards are properly seated, and then reboot the system.
4-3-1	Memory failure above address 0FFFFh	Remove and resseat the DIMMs. If the problem persists, replace the DIMMs. If the problem still persists, replace the system board.

4-3-3	Timer-chip counter 2 failure	Replace the system board.
4-3-4	Time-of-day clock stopped	Replace the battery. If the problem persists, replace the system board.
4-4-1	Serial/parallel port test failure	Replace the system board.

System Error Messages

[Table 2](#) lists (in alphabetical order) system error messages that can appear on the monitor screen. These messages can help you find the source of a problem.

Fatal System Error Messages

Some error messages indicate fatal errors. When a fatal error occurs, the system usually cannot be rebooted until an appropriate hardware change has been made. The following messages indicate that a fatal error has occurred. Their definitions and probable causes are listed in [Table 2](#).

- Alert! Primary processor is out of rev. System halted
- Alert! Secondary processor is out of rev. System halted
- Bad error-correction code (ECC) on disk read
- Controller has failed
- Data error
- ECC memory error
- Gate A20 failure
- Hard disk controller failure
- Hard disk drive read failure
- Hard disk failure
- Keyboard clock line failure
- Keyboard controller failure
- Keyboard data line failure
- Keyboard stuck key failure
- No timer tick interrupt
- Shutdown failure
- Terminator/processor card not installed! System halted!
- Timer chip counter 2 failed

Table 2. System Error Messages

Message	Cause	Corrective Action
Address mark not found	BIOS found faulty disk sector or could not find particular disk sector.	Check the disk interface cable and connector for a proper connection. If the problem still persists, replace the system board.
Attachment failed to respond	Diskette drive or hard-disk drive	

	controller cannot send data to associated drive.	
Alert! Cover was previously removed.	Cover was previously removed.	Reset the chassis intrusion detector.
Alert! Hard disk drive thermal probe failure detected.	Hard-disk drive thermal probe has failed.	No hard-disk drive thermal probe installed, defective thermal probe, or thermal cable not connected to the control panel. Check the thermal probe cable connection, and add or replace the probe assembly.
Alert! One or more of the Memory DIMMs are out of rev.	System detected that one or more of the DIMMs are not the correct revision.	Replace one or more DIMMs with DIMMs that meet Intel's SPD 1.2 specification (66-MHz DIMMs from Dell).
Alert! Power supply fan failure detected.	Power supply fan has failed.	Replace the power supply. If the problem persists, replace the system board.
Alert! Previous fan failure.	System fan failed during the previous operating session.	Ensure the fan cable is connected and that a fan is installed. Reconnect the fan cable or replace the fan.
Alert! Previous thermal failure.	The microprocessor exceeded its recommended operating temperature during the previous operating session.	Ensure the system vents are not blocked and that the fan operates.
Alert! Previous voltage failure.	System voltage exceeded or fell below an acceptable threshold.	Replace the power supply.
Alert! Primary processor is out of rev. System halted	System detected that the primary processor is not the correct revision. If the system contains	Replace with a Dell-supported microprocessor.

	more than 512 MB of RAM.	
Alert! Processor thermal probe failure detected.	Microprocessor or system board has failed.	Replace the microprocessor. If the problem still persists, replace the system board.
Alert! Secondary processor is out of rev. System halted	System detected that the secondary processor is not the correct revision. If the system contains more than 512 MB of RAM.	Replace with a Dell-supported microprocessor.
Alert! Single-bit memory error previously detected in XXXXh.	Single-bit ECC error was detected during the previous operating session.	Reseat or replace one or more DIMMs. If the problem still persists, replace the system board.
Alert! System fan was not detected.	System fan was not detected.	Check that the fan cable is properly connected. If the cable is connected, replace the fan.
Alert! Unbuffered and registered SDRAM DIMMs cannot be mixed.	Mixing of unbuffered and registered SDRAM DIMMs is not supported.	Replace one or more DIMMs so all DIMMs are either unbuffered DIMMs or registered DIMMs.
Alert! Uncorrectable memory error previously detected in XXXXh.	Multibit ECC error was detected during the previous operating session.	Reseat or replace DIMMs. If the problem still persists, replace the system board.
Auxiliary Device failure. Verify that mouse and keyboard are securely attached to connectors.	System detected a mouse failure.	Ensure a mouse is connected to the mouse connector. If the failure persists, replace the system board.
Bad command or file name	Command entered does not exist, is faulty, or is not in pathname specified.	Correct the command or filename and re-enter the command.
Bad error-correction code (ECC) on disk read	Diskette drive or hard-disk drive controller	Replace the system board.

	detected an uncorrectable read error.	
Boot: Couldn't find NTLDR	A nonbootable diskette formatted with Microsoft® Windows NT® was detected in the diskette drive.	Remove the diskette from the diskette drive and allow the system to boot from the hard-disk drive or, replace the diskette with a bootable Windows NT diskette.
Controller has failed	Hard-disk drive or associated controller is defective.	Ensure the CMOS settings for the installed hard-disk drives are correct. If CMOS disk settings are correct, replace the hard-disk drive. If failure still occurs, replace the system board.
Data error	System received unrecoverable data-read error from diskette or hard-disk drive.	Replace the diskette, diskette drive, or hard-disk drive.
Decreasing available memory	Read/write failure during POST prevents system from using available memory.	Reseat or replace one or more DIMMs.
Diskette drive 0 seek failure	Diskette/tape drive controller could not locate specific sector or track.	Replace the diskette drive or tape drive. Ensure settings for diskette drive or tape drive are correct in the System Setup program. Check drive interface and power cables.
Diskette drive 1 seek failure		
Diskette read failure	Failure occurred while system attempted to read diskette.	Replace the diskette. Ensure the diskette interface cables are properly connected and that the power cable is attached. Replace the diskette drive.
Diskette subsystem reset failed	System could not successfully issue reset command to diskette controller.	Replace the system board.

Diskette write protected	Diskette write-protect feature was activated.	Close the diskette write-protect sliding tab.
Drive not ready	Diskette is missing from or is improperly inserted in diskette drive.	Ensure the diskette is properly inserted in the drive. Run chkdsk or another disk verification utility to ensure the diskette is formatted and not defective.
ECC memory error	Uncorrectable multibit ECC memory error is detected.	Reseat or replace all DIMMs. If the problem still persists, replace the system board.
Gate A20 failure	Gate A20 of the keyboard controller malfunctioned.	Replace the system board.
General failure	Operating system cannot execute command.	Reinstall the operating system.
Hard disk controller failure	Hard-disk drive failed to initialize.	Examine and correct disk configuration settings in System Setup program. Check the drive power and interface cables to ensure they are properly connected. Replace the system board.
Hard disk drive read failure		
Hard disk failure		
Invalid configuration information - please run SETUP program	System Setup program contains incorrect system configuration settings.	Examine and verify the configuration settings in the System Setup program. Replace the battery and reconfigure using the System Setup program.
Keyboard clock line failure	System cannot communicate with keyboard.	Check the keyboard cable for a proper connection. Replace the system board.
Keyboard failure		
Keyboard data line failure		
Keyboard stuck key failure		
Keyboard controller failure	Keyboard/mouse controller failed.	Replace the system board.
Memory address line failure at address, read value expecting value	During memory test, value read at address was incorrect.	Reseat or replace one or more DIMMs. If problem persists, replace the system board.
Memory data line failure at address, read value expecting value		

Memory double word logic failure at address, read value expecting value		
Memory odd/even logic failure at address, read value expecting value		
Memory write/read failure at address, read value expecting value		
Memory allocation error	Software in use conflicts with operating system, application program, or utility.	Contact the application vendor for technical support.
Memory tests terminated by keystroke	Memory test did not complete.	No action required. The POST memory tests were terminated by the user by pressing <Spacebar>.
Network card is not present in the system	System does not detect NIC.	Reseat the NIC. Reinstall NIC drivers.
No boot device available	System does not recognize diskette drive or hard-disk drive from which it is trying to boot.	If booting from a diskette, ensure a bootable diskette is in the diskette drive. If booting from a hard-disk drive, replace the hard-disk drive. If problem persists, replace the system board.
No boot sector on hard-disk drive	Incorrect configuration settings in System Setup program, or corrupted operating system.	Verify the System Setup information is correct. Install an operating system on the hard-disk drive.
No timer tick interrupt	Timer on system board is malfunctioning.	Replace the system board.
Non-system disk or disk error	Diskette in drive A or hard-disk drive does not have bootable operating system installed on it.	Ensure the diskette is a bootable diskette. If booting from a hard-disk drive, ensure the hard-disk drive is formatted and contains an operating system. Replace the system board.
Not a boot diskette	No operating system on diskette.	Replace the diskette with a bootable diskette.

Plug and Play Configuration Error	System encountered problem in trying to configure one or more expansion cards.	Manually resolve IRQ/DMA conflicts.
Previous unrecoverable memory error or system error (NMI) occurred.	Either a multi-bit ECC memory error or a PCI card failure was detected.	Reseat all DIMMs and all PCI cards and try again. If the problem still persists, replace the DIMMs and try again. If the problem still persists, replace the PCI cards and try again. If the problem still persists, replace the system board.
Processor is not in the primary slot	The only microprocessor in the system is in the secondary slot.	Move the processor to the primary slot.
Read fault	The MS-DOS [®] operating system cannot read from diskette or hard-disk drive.	Repair (chkdsk), reformat, or replace the disk or diskette. If the problem persists, replace the system board.
Requested sector not found	System could not find particular sector on disk, or requested sector is defective.	
Reset failed	Disk reset operation failed.	Check the diskette, tape, or hard-disk interface and power cables for a proper connection.
Sector not found	MS-DOS is unable to locate sector on diskette or hard-disk drive.	Repair (chkdsk), reformat, or replace the diskette or hard-disk drive.
Seek error	MS-DOS is unable to locate specific track on diskette or hard-disk drive.	Replace the diskette or hard-disk drive.
Seek operation failed	System could not	Replace the diskette or hard-

	find particular address mark on disk.	disk drive.
Shutdown failure	System board chip is faulty.	Replace the system board.
System halted	System locked up because the processor is not the correct revision.	Ensure at least 512 MB of RAM is installed. Replace the processor with a Dell-supported microprocessor.
Terminator/processor card not installed! System halted!	System does not have terminator card or secondary processor.	Reseat or replace the terminator card or secondary processor.
Time-of-day clock stopped	System battery is low.	Replace the battery. If the problem persists, replace the system board.
Time-of-day not set	Time or Date settings in System Setup program are incorrect, or the system battery does not work.	Set the date and time. Replace the battery.
Timer chip counter 2 failed	Timer circuit on system board is malfunctioning.	Replace the system board.
WARNING: Dell's Disk Monitoring System has detected that drive [0/1] on the [0/1] EIDE controller is operating outside of normal specifications. It is advisable to immediately back up your data and replace your hard-disk drive by calling your support desk or Dell Computer Corporation.	POST queried EIDE drive for status. Drive detected possible error conditions.	Replace the hard-disk drive.
Write fault	MS-DOS cannot write to diskette or hard-disk drive.	Replace the diskette or hard-disk drive.
Write fault on selected drive		

Alert Messages From Dell OpenManage™ Tools for HP OpenView

The Dell OpenManage Tools for HP OpenView server-management application program generates alert messages that appear in the SNMP trap log file. To see the trap log, select any enterprise under the SNMP trap log icon.

Alert log messages consist of information, status, warning, and failure messages for drive, temperature, fan, and power conditions. They can assist you with identifying a problem and may provide you with information

to help you resolve the problem.

See the documentation for Dell OpenManage Tools for HP OpenView NNM SE for these messages.

[Back to Contents Page](#)

Removing and Replacing Parts: Dell™ PowerEdge™ 1300 Systems Service Manual

[Overview](#) • [Recommended Tools](#) • [Precautionary Measures](#) • [Removing the Computer Cover](#) • [Front Bezel](#) • [Power and Reset Buttons](#) • [Front-Panel Inserts](#) • [Control Panel](#) • [Drives](#) • [System Power Supply](#) • [Microprocessor Fan](#) • [System Board Components](#) • [Expansion Cards](#) • [DIMM Removal/Installation](#) • [Microprocessor SEC Cartridge/Heat Sink Assembly](#) • [Terminator Card](#) • [System Battery](#) • [System Board Removal](#)

Overview

This file provides procedures for removing the components, assemblies, and subassemblies in the Dell PowerEdge 1300.

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

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

Recommended Tools

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

- Small flat-blade screwdriver
- Wide flat-blade screwdriver
- #1 and #2 Phillips-head screwdrivers
- 1/4-inch nutdriver
- Tweezers or long-nose pliers

Also, use a wrist grounding strap as explained in [Precautionary Measures](#).

Precautionary Measures

Before you perform any of the procedures in this file, take a few moments to read the following warning for your personal safety and to prevent damage to the system from ESD.

WARNING: FOR YOUR PERSONAL SAFETY AND PROTECTION OF THE EQUIPMENT

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

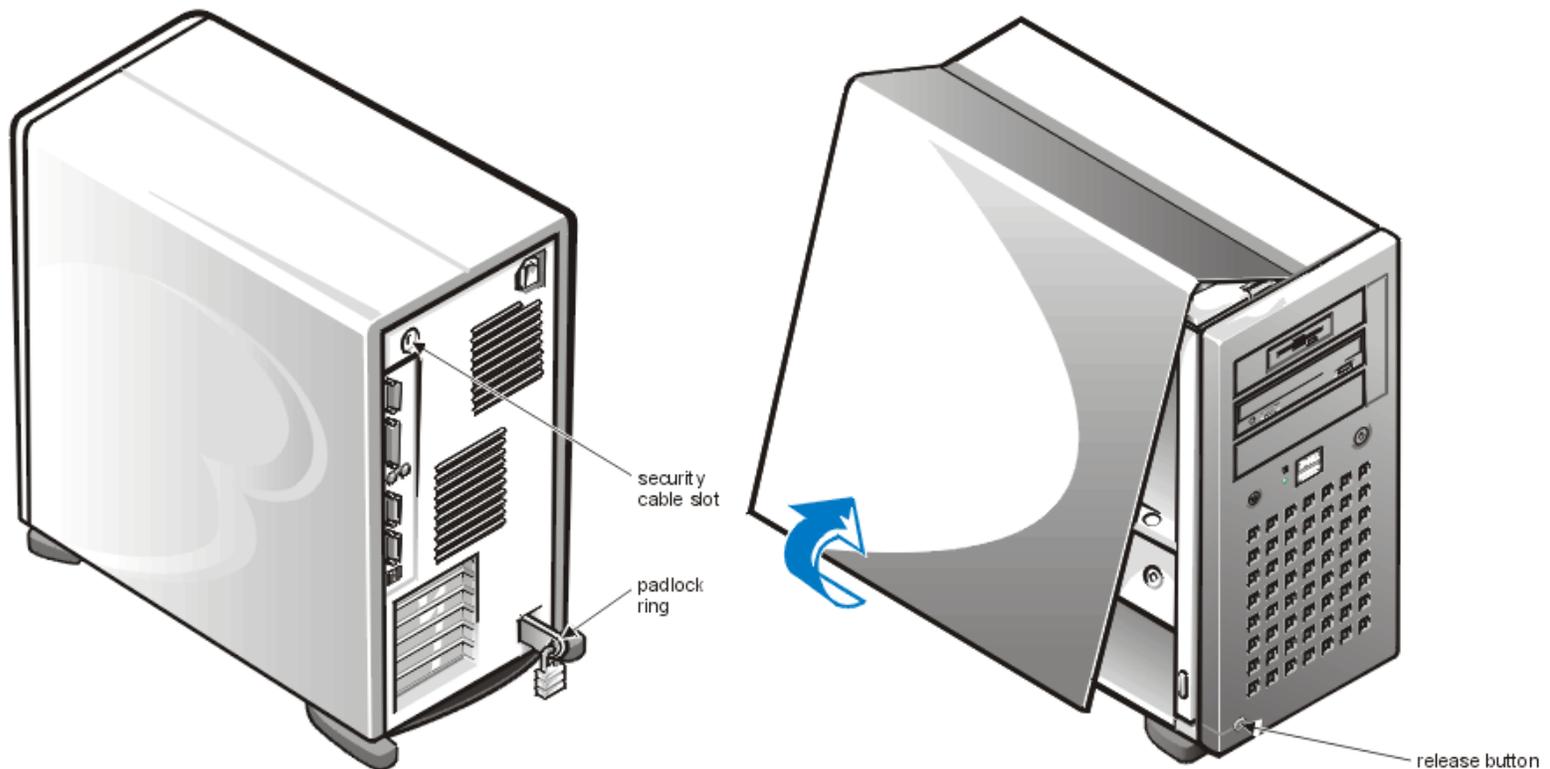
- 1. Turn off the computer and all peripherals.**
- 2. Disconnect the computer and peripherals from their AC power sources. Also, disconnect any telephone or telecommunication lines from the computer. Doing so reduces the potential for personal injury or shock.**
- 3. If you are disconnecting a peripheral from the computer or are removing a component from the system board, wait 10 to 20 seconds after disconnecting the computer from AC power before disconnecting the peripheral or removing the component to avoid possible damage to the system board.**
- 4. Wear a wrist grounding strap, and clip it to an unpainted metal surface, such as the padlock loop on the back of the chassis. If a wrist grounding strap is not available, touch any unpainted metal surface on the back of the computer or on the computer chassis, such as the power supply, to discharge any static charge from your body before touching anything inside the computer. While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might**

harm internal components. Also avoid touching components or contacts on a card and avoid touching pins on a chip.

5. Verify that the standby LED on the system board is not on. If it is on, you may need to wait 10 to 30 seconds for it to go out (see [System Board](#)).

Removing the Computer Cover

Figure 1. Computer Cover Removal

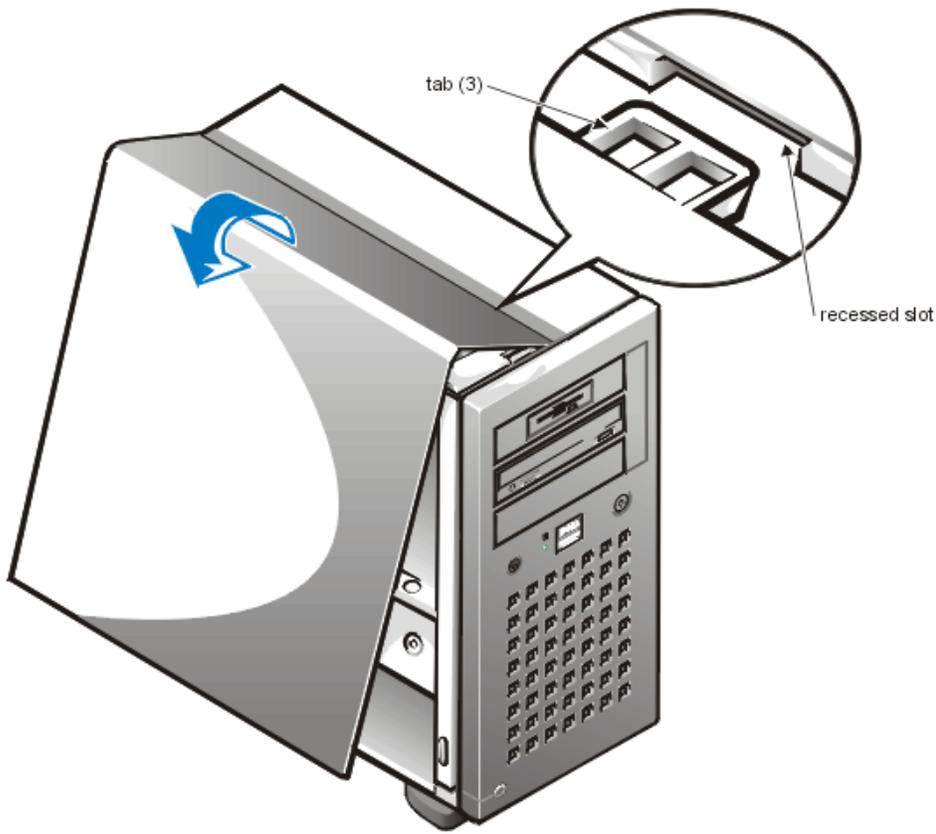


To remove the computer cover, perform the following steps:

1. Remove the padlock from the padlock ring on the back panel of the computer, if one is installed.
2. Facing the left side of the computer, press the release button at the bottom-left corner of the front bezel.
3. Lift the bottom of the cover, allowing it to pivot up toward you.
4. Disengage the tabs that secure the cover to the top of the chassis, and lift the cover away.

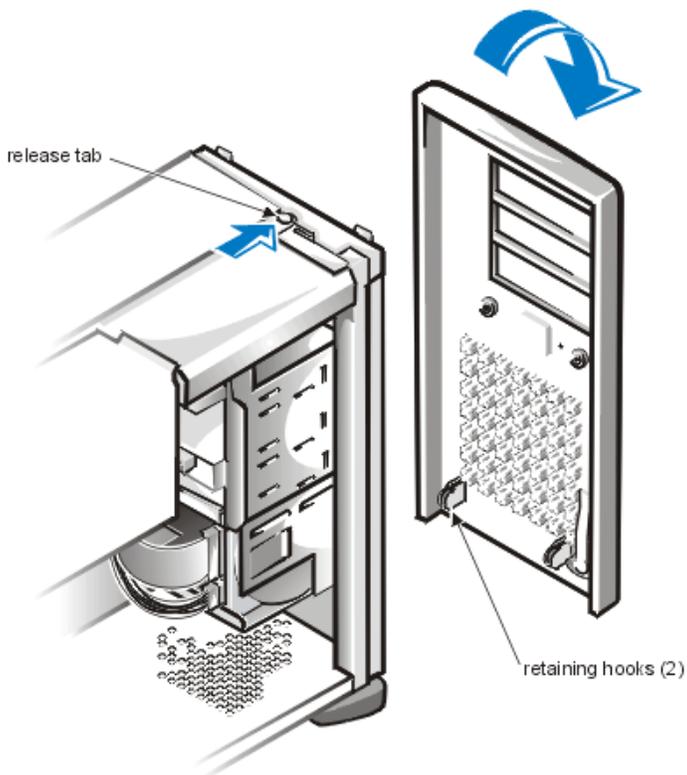
To replace the cover, insert the tabs on the cover into the recessed slot on the chassis and lower the cover until it fits flush with the side of the computer.

Figure 2. Reinstalling the Cover



Front Bezel

Figure 3. Front Bezel Removal



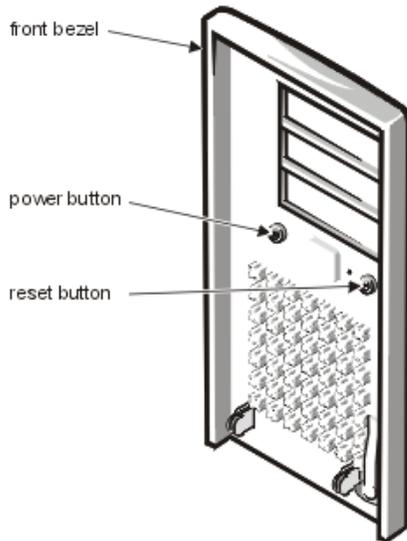
To remove the front bezel, perform the following steps:

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

To replace the bezel, align the retaining hooks with the slots in the chassis and press the top of the bezel toward the chassis until the tabs on top of the chassis snap the bezel into place.

Power and Reset Buttons

Figure 4. Power and Reset Button Removal

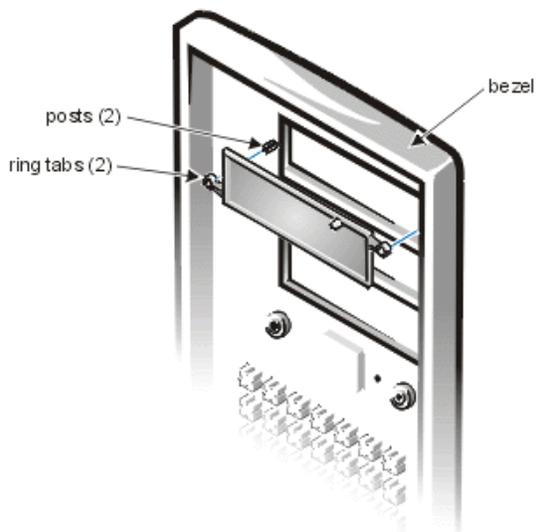


To remove the power and reset buttons, perform the following steps:

1. Lay the front bezel on a flat work surface, with the back of the bezel facing up.
 2. To remove the power button or the reset button, use a small screwdriver and push in the two or three plastic clips that hold the button to the bezel. When these clips are released, the buttons come free from the bezel.
-

Front-Panel Inserts

Figure 5. 5.25-Inch Front-Panel Insert Removal



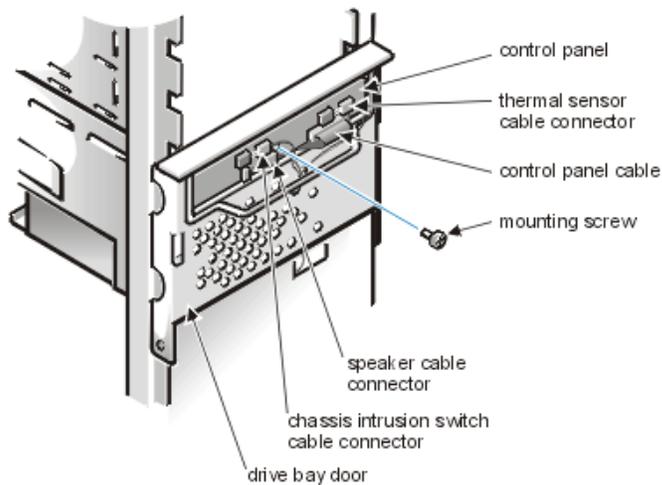
To remove a 5.25-inch front-panel insert, perform the following steps:

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

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

Control Panel

Figure 6. Control Panel Removal



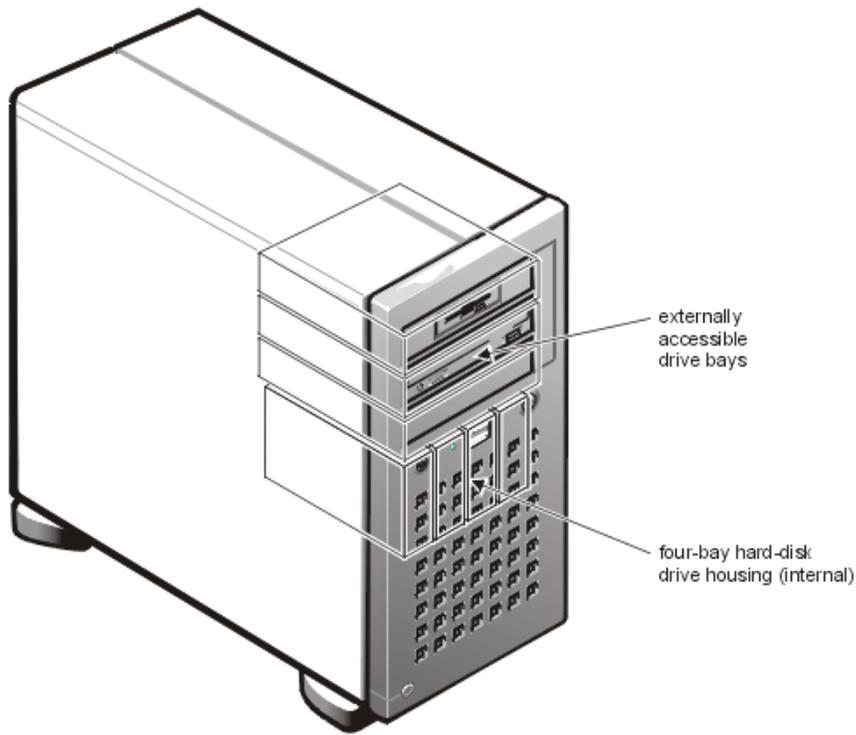
To remove the control panel, perform the following steps:

1. Disconnect the control panel cable from the PANEL connector on the system board (see [System Board Components](#) for the location of the PANEL connector).
 2. Note the routing of the control panel cable as you remove it from the chassis.
 3. Disconnect the the chassis intrusion switch cable connector and the thermal sensor cable connector from the control panel.
 4. Remove the mounting screw that secures the control panel to the chassis.
 5. Remove the control panel cable.
 6. Open the drive cage door, pull the control panel cable through the opening in the front wall, and carefully remove the cable from the routing tab in the drive cage door.
 7. Pull out on the control panel to detach it from the chassis.
-

Drives

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

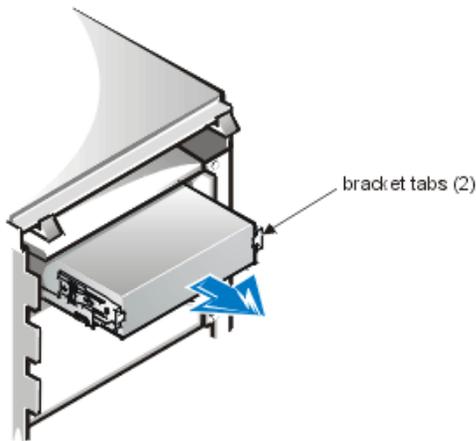
Figure 7. Drive Locations



Removing a 5.25-Inch Drive From a Drive Bay

 **NOTE:** For easier access inside the chassis, you may rotate the power supply out of the way temporarily. See [Figure 12, Power Supply Removal](#).

Figure 8. Removing a Drive



1. Disconnect the DC power cable and the interface cable from the back of the drive.
2. Press the bracket tab on either side of the drive toward the center of the drive and slide the bracket out of the bay.
3. To remove the drive from the bracket, turn the drive/bracket assembly upside down and unscrew the four screws that secure the drive to the bracket.

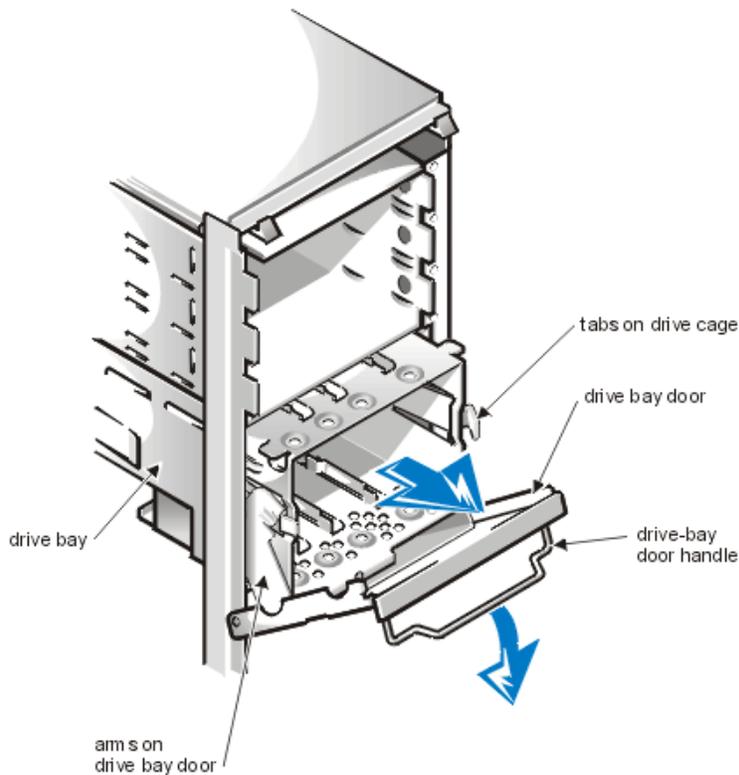
Removing a Hard-Disk Drive From the Internal Drive Cage

Remove a SCSI hard-disk drive from the hard-disk drive cage by performing the following steps:

1. Remove the computer cover as instructed in [Removing the Computer Cover](#).

2. Remove the front bezel according to the instructions in [Front Bezel](#).
3. Open the drive cage door. Disconnect the DC power cable and interface cable from each drive.
4. Grasp the handle of the drive bay door on the front of the chassis, and pull out and down until the arms on the drive cage door (see [Figure 9](#), Removing the Hard-Disk Drive Cage) disengage from the tabs on the bracket. This action pulls the cage out of the drive bay about 1 to 3 inches.

Figure 9. Removing the Hard-Disk Drive Cage

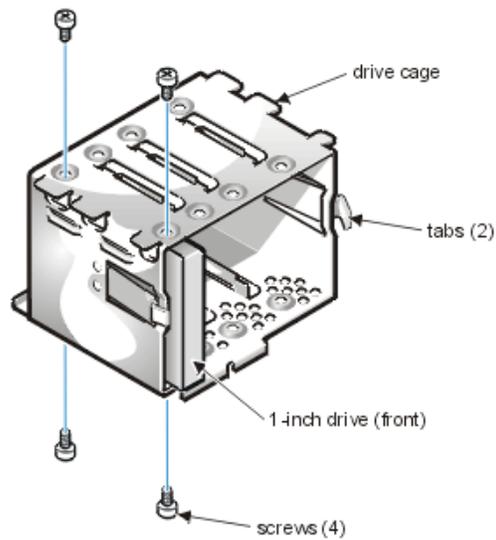


5. Remove the cage from the drive bay.
6. Remove the four screws that hold the drive in the cage.
7. Remove the drive by sliding it out of the cage.



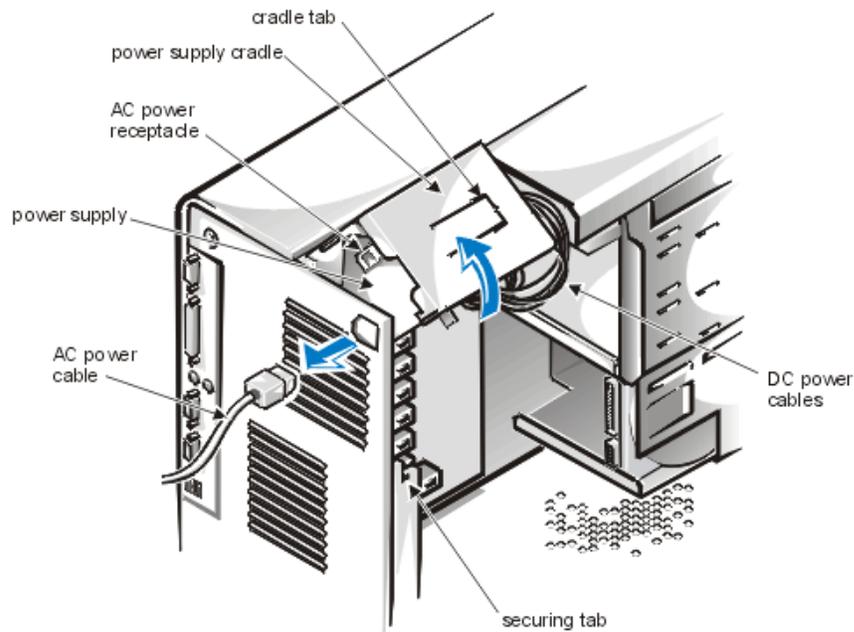
CAUTION: To prevent damage to the drive cage, drive bay, or drive bay door when reinstalling the hard-disk drive cage, push the drive cage into the drive bay until the tabs snap into place before you close the drive bay door. Fold the drive bay door handle down before attempting to replace the bezel.

Figure 10. Removing a Hard-Disk From the Drive Cage



System Power Supply

Figure 11. Power Supply Removal

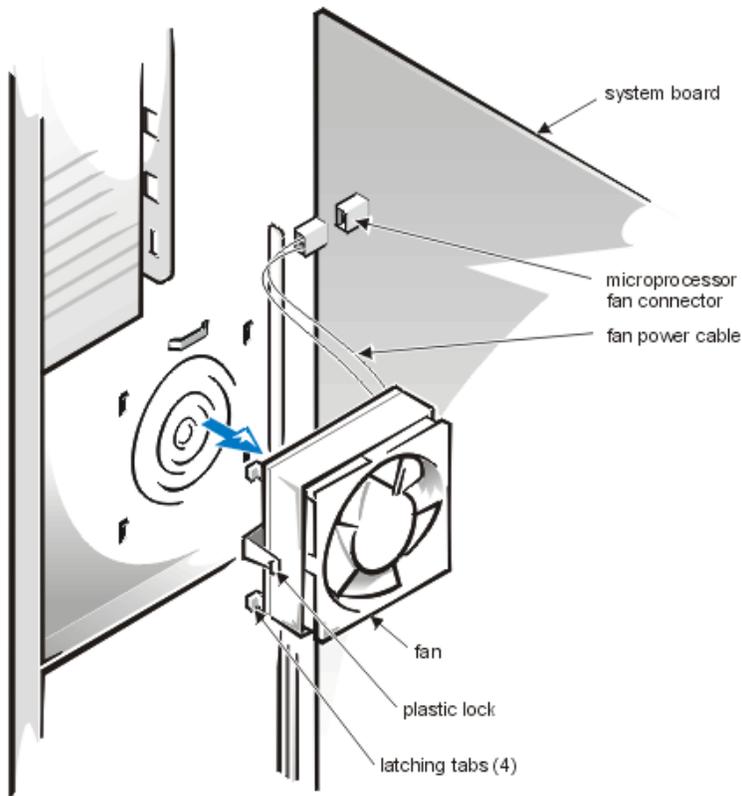


To remove the system power supply, perform the following steps:

1. Disconnect the AC power cable from the back of the power supply.
2. Free the system power supply from the securing tab labeled "RELEASE —>" and rotate it upward until it locks.
3. Disconnect the DC power cables from the system board and the drives. Note the routing of the DC power cables underneath the tabs in the chassis as you remove them from the system board and drives. It is important to route these cables properly when you replace them to prevent them from being pinched or crimped.
4. Remove the screw above the AC power receptacle.
5. Lift up on the power supply cradle tab to release the power supply from the cradle and slide the power supply toward the front of the computer approximately 1 inch.
6. Lower the power supply down and away from the computer.

Microprocessor Fan

Figure 12. Microprocessor Fan Removal



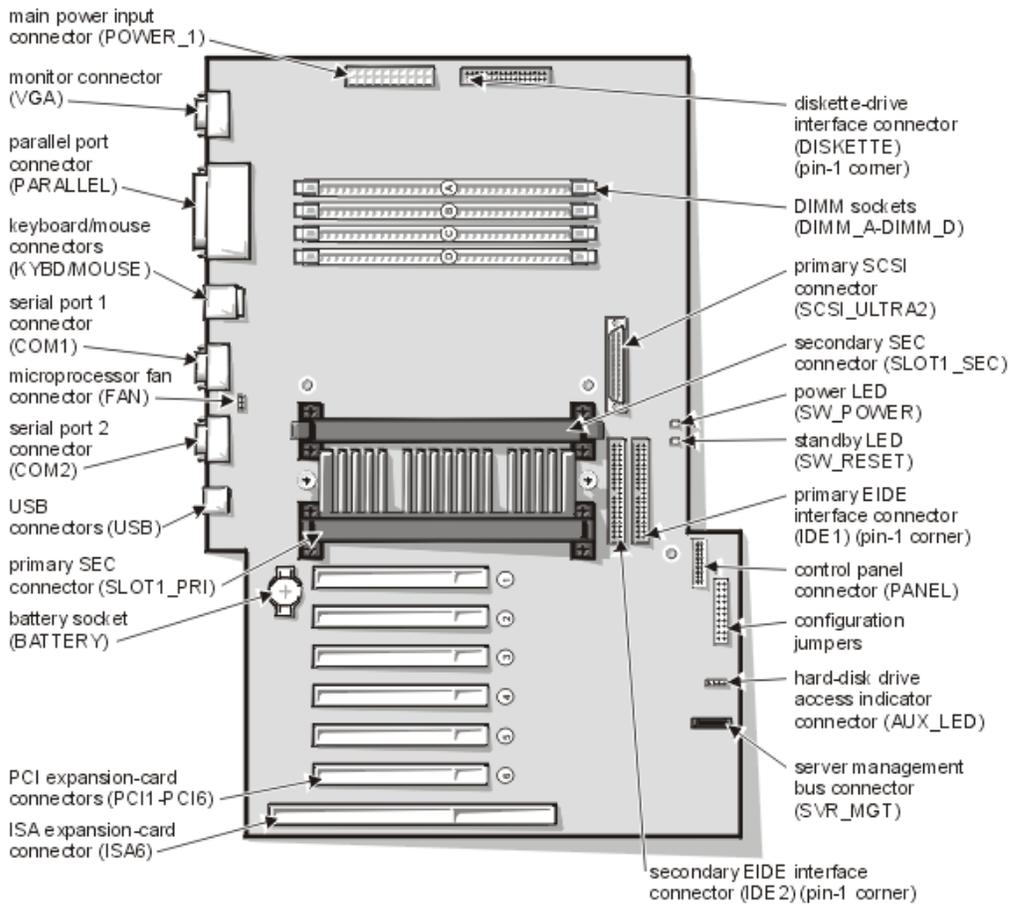
To remove the microprocessor fan, perform the following steps:

1. Rotate the power supply up until it locks (see [Figure 11](#), Power Supply Removal).
2. Disconnect the fan power cable from the microprocessor fan connector.
3. Gently pull the plastic lock, and push down on the fan to disengage the four latching tabs holding the fan to the back of the chassis.
4. Pull the fan forward to remove it.

System Board Components

The subsections that follow contain procedures for removing system board components, which are shown in Figure 13.

Figure 13. System Board



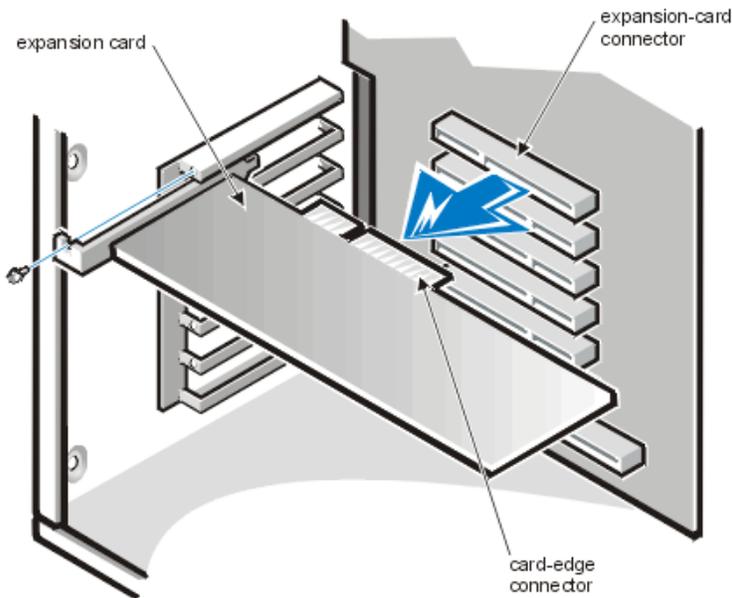
Expansion Cards

There are seven expansion-card connectors on the system board (see [Figure 13](#), System Board). Expansion-card connectors PCI1 through PCI6 support 32-bit PCI expansion cards; expansion-card connector ISA6 can accommodate an 8- or 16-bit ISA expansion card. The PCI1 slot is limited to a half-length card.

 **NOTES:** Connector ISA6 shares expansion-card slot space with connector PCI6. Therefore, only one card of either type can be installed in this slot.

PCI4 has an in-line connector to support a DRAC card (SVR_MGT connector on the system board).

Figure 14. Removing an Expansion Card



Perform the following steps to remove an expansion card:

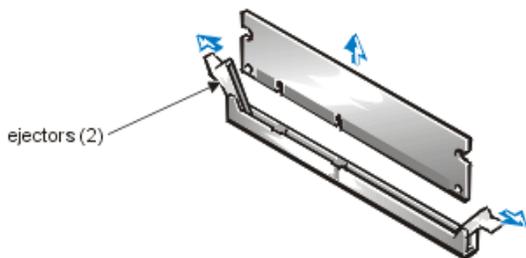
1. If necessary, disconnect any cables connected to the card.
2. Unscrew the mounting bracket of the card you want to remove.
3. Grasp the card by its outside corners, and ease it out of its connector.
4. If you are removing the card permanently, install a metal filler bracket over the empty card-slot opening.
5. Replace the computer cover, and reconnect your computer and peripherals to their power sources and turn them on.
6. To reset the chassis intrusion detector, enter the System Setup program and reset **Chassis Intrusion** to **Not Detected**.

DIMM Removal/Installation

To remove a DIMM, perform the following steps:

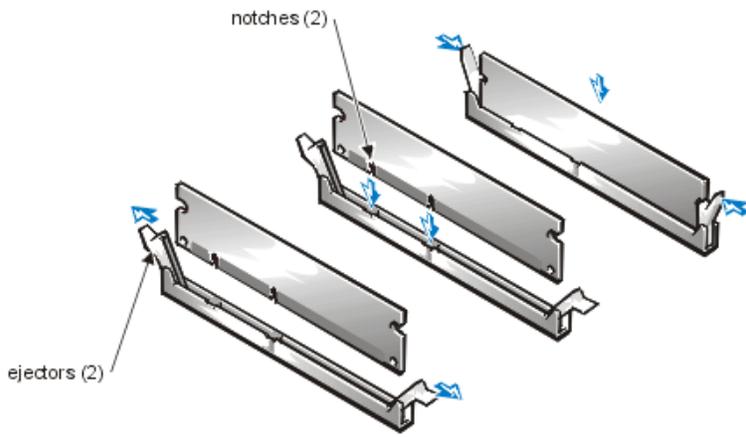
1. Unlatch and rotate the power supply up until it locks (see [Figure 11](#), Power Supply Removal).
2. Push outward on the DIMM socket securing clips until the DIMM is released from its socket.
3. Lift the DIMM away from the socket.

Figure 15. DIMM Removal



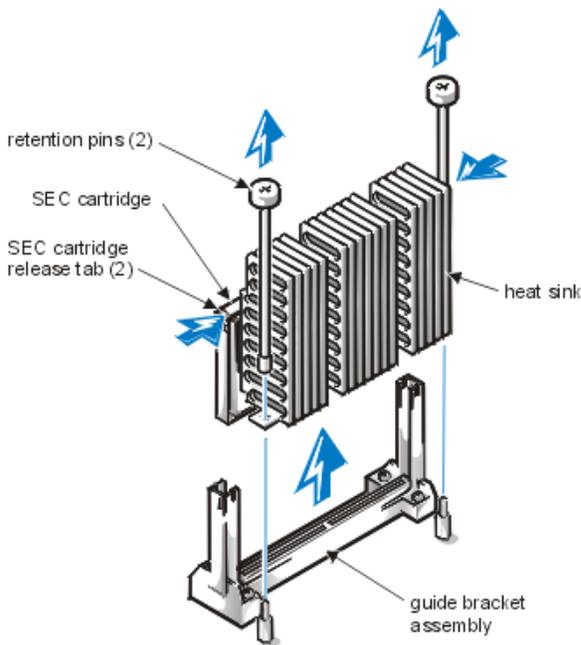
To replace a DIMM, press the DIMM fully into the socket while closing the securing clips to lock the DIMM into the socket (see [Figure 16](#)).

Figure 16. DIMM Installation



Microprocessor SEC Cartridge/Heat Sink Assembly

Figure 17. Microprocessor SEC Cartridge/Heat Sink Removal



To remove a microprocessor SEC cartridge/heat sink assembly, perform the following steps:

⚠ WARNING: The microprocessor SEC cartridge/heat sink assembly can get extremely hot. Be sure that the assembly has had sufficient time to cool before you touch it.

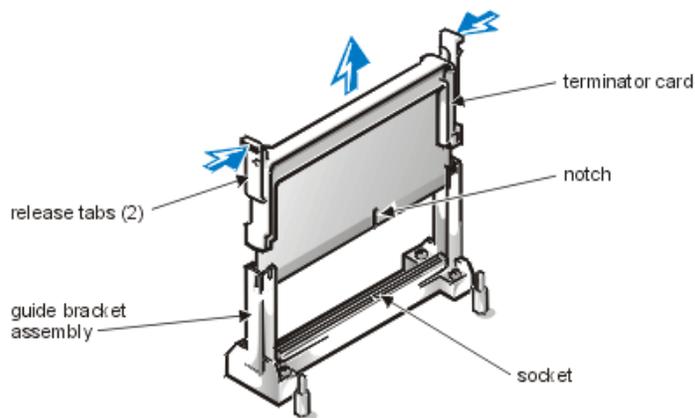
1. Unscrew and remove the two thumbscrews that secure the heat sink to the system board.
2. Press the microprocessor SEC cartridge release latches inward until they snap into position.
3. Grasp the microprocessor SEC cartridge firmly, and pull straight up on the cartridge to remove it from the guide bracket assembly (see Figure 17).
4. You must use up to 15 lb of force to disengage the microprocessor SEC cartridge from its connector.

To install a microprocessor SEC cartridge/heat sink assembly, first verify that the cartridge release latches are pulled out. Then slide the cartridge into the guide bracket assembly, with the heat sink toward the bottom of the chassis, and firmly seat the assembly. You must use up to 25 lb of force to seat the cartridge in its connector. Install the two thumbscrews that secure the heat sink to the system board.

Verify the microprocessor is acknowledged by the system by running the System Setup program. If you are upgrading a microprocessor, you may need to update your system software (for example, the BIOS).

Terminator Card

Figure 18. Terminator Card Removal

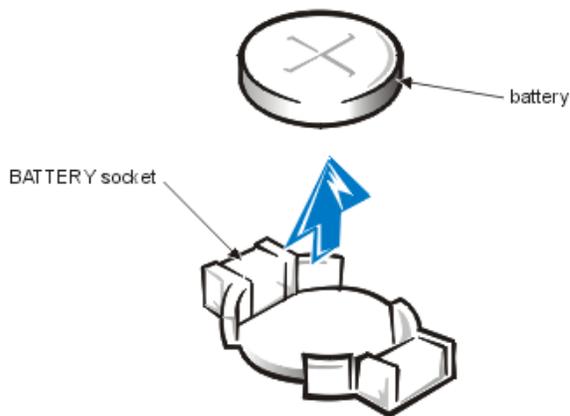


If you are installing a secondary microprocessor SEC cartridge/heat sink assembly, you need to remove the terminator card from the SLOT1_SEC connector on the system board by performing the following steps:

1. Press the microprocessor SEC cartridge release latches inward until they snap into position (see Figure 18).
2. Pull the terminator card straight out to remove it from the connector.

System Battery

Figure 19. System Battery Removal



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

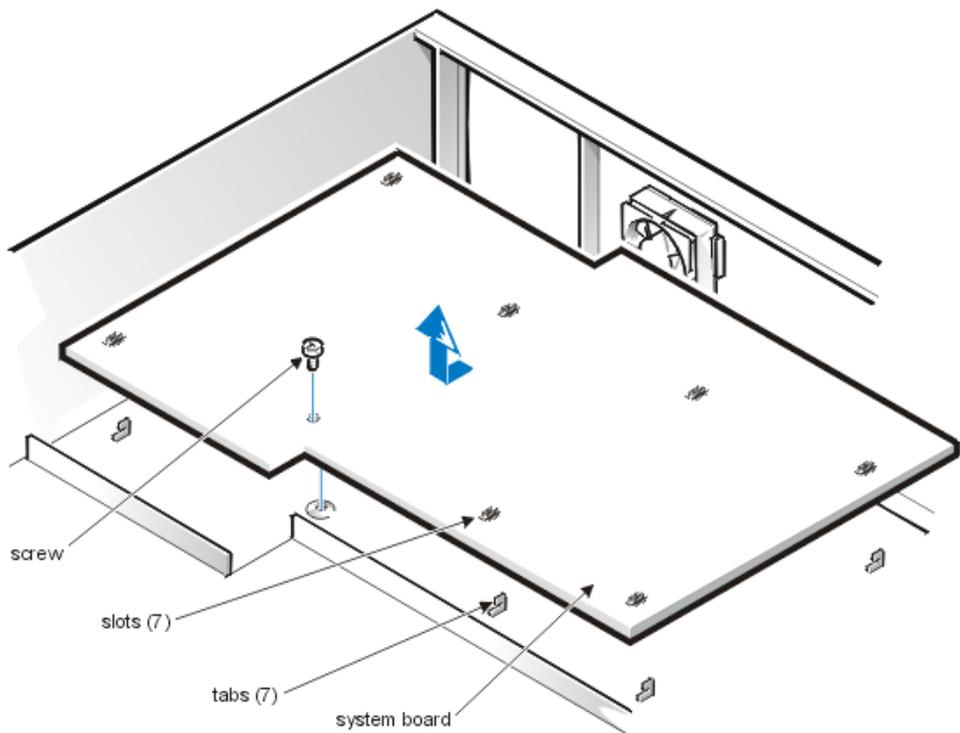
To remove the system battery, perform the following steps:

1. If possible, enter the System Setup program and print the System Setup screens.
2. Rotate the power supply up until it locks (see [Figure 12](#), Power Supply Removal).
3. Remove the system battery by carefully prying it out of its socket with your fingers or with a blunt, nonconducting object, such as a plastic screwdriver.

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

System Board Removal

Figure 20. System Board Removal



To remove the system board, perform the following steps:

1. Place the computer on its side on a flat surface.
2. Disconnect all cables from their connectors at the back of the computer.
3. Unlatch and rotate the power supply until it locks (see [Figure 12](#), Power Supply Removal)
4. Disconnect all cables from the system board.
5. Remove the microprocessor fan (see [Microprocessor Fan](#)).
6. Remove the screw that secures the system board to the bottom of the chassis.
7. Slide the system board toward the front of the chassis until it stops.
8. Carefully lift the system board out of the chassis (be sure to lift evenly and not twist the system board).

If you are replacing a system board, remove the DIMMs, the primary microprocessor SEC cartridge/heat sink assembly, and the terminator card or secondary microprocessor assembly, and install them on the replacement board.

When you reinstall the system board, before you slide the system board back to lock it in position, push down near each slot to engage the grounding clip onto its corresponding tab. Push evenly on both sides of the system board as you slide it into position (do not twist the system board).

[Back to Contents Page](#)

Using the System Setup Program: Dell™ PowerEdge™ 1300 Service Manual

[Overview](#) • [Entering the System Setup Program](#) • [System Setup Screens](#)

Overview

This file describes the System Setup program, which is used to change the system configuration information stored in NVRAM on the system board. For in-depth information about the System Setup program, refer to the *Dell PowerEdge 1300 Systems User's Guide*.

 **CAUTION:** Whenever you make changes to the System Setup program or add, reposition, or remove ISA expansion cards, add or remove memory, or change settings for built-in devices, you must run the RCU, make any necessary changes, and save the system configuration information. Failure to do so may cause resource conflicts between PCI devices (such as PCI expansion cards, the built-in video controller, or the built-in SCSI host adapter). See "Configuring ISA and PCI Expansion Cards" in the "Using the Resource Configuration Utility" section in the *User's Guide* for more information about how PCI devices are configured based on settings in the RCU.

Entering the System Setup Program

Enter the System Setup program by performing the following steps:

1. Turn on (or reboot) your system.
2. Press <F2> immediately after you see the following message:
Press <F2> for System Setup

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

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

System Setup Screens

Figure 1, System Setup Screens, shows sample System Setup screens. The actual contents of your setup screens may differ slightly from the example shown, depending on the characteristics of your PowerEdge 1300. [Table 1](#), System Setup Options, briefly describes each setup option.

Figure 1. System Setup Screens

configuration options		title bar		help	
page 1 of 2		Dell Computer Corporation (www.dell.com) System PowerEdge 1300 Setup		BIOS version A00	
Time: 18:05:46		Date: Fri Nov 14, 1998		This category sets the time in 24-hour format (hour:minutes:seconds) for the internal clock calendar.	
Diskette Drive A: 3.5 inch, 1.44 MB				To change the value in a field, enter a number or use the left- or right-arrow key.	
IDE Drives:				Changes take effect immediately	
Primary		Type Cyls Hds Pre LZ Sec Size			
Drive 0:		None			
Drive 1:		None			
Secondary					
Drive 0:		None			
Drive 1:		None			
Reserved Memory:		None			
CPU Speed:		350 MHz		Pentium II Processor - 350 MHz	
Num Lock:		On		Level 2 cache: 512 KB integrated	
Reset Button:		Enabled		System Memory: 128 MB ECC SDRAM	
Video DAC Snoop:		off		Video Memory: 2 MB SGRAM	
Processor 1:		A0		Service Tag: 12345	
Processor 2:		Not installed			
Tab, Shift-Tab change fields		←, → change values		Alt-P next Esc exit Alt-B reboot	
		key functions		system data	

page 2 of 2		Dell Computer Corporation (www.dell.com) System PowerEdge 1300 Setup		BIOS version A00	
Keyboard Errors: Do Not Report		System Password: Not Enabled		This category sets whether keyboard-related error messages are reported at system start-up. Changes take effect after reboot.	
Password Status: Unlocked		Boot Sequence: Diskette First			
Setup Password: Not Enabled		Auto Power On: Disabled 00 00			
Power Management: Disabled		Chassis Intrusion: Not Detected			
----- Integrated Devices -----					
Mouse: On				Pentium II Processor - 350 MHz	
Serial Port 1: Auto				Level 2 cache: 512 KB integrated	
Serial Port 2: Auto				System Memory: 128 MB ECC SDRAM	
Parallel Port: 378h				Video Memory: 2 MB SGRAM	
Parallel Mode: PS/2				Service Tag: 12345	
IDE Controller: Auto					
Diskette: Auto					
Speaker: On					
SCSI: off					
Tab, Shift-Tab change fields		←, → change values		Alt-P next Esc exit Alt-B reboot	

Table 1. System Setup Options

Option	Function
Time	Resets the time on the computer's internal clock.
Date	Resets the date on the computer's internal calendar.
Diskette Drive A	Identifies the type of diskette drive installed in your computer.
IDE Drives:	Identifies drives attached to the IDE1 and IDE2 connectors on the system board. Each EIDE connector supports two EIDE drives (Drive 0 and Drive 1).
Primary (Drives 0,1); Secondary (Drives 0,1)	In the Primary and the Secondary drive sections, the Drive 0 and Drive 1 options identify the type of EIDE hard-disk drives installed in the computer.

Options include:

- **Auto** (auto detect drive type/characteristics)
- **None** (no disk installed)
- **Usr1** or **Usr2** (user defined drive parameters)
- A specific drive-type number (retrieve drive characteristics from a table in BIOS)



*NOTES: If you do not have any IDE/EIDE hard-disks or CD-ROMs installed in your system, specify **None** as the **Type** setting for the both **Drive 0** and **Drive 1** in the **Primary** and **Secondary** IDE drive sections in System Setup.*

*If you have the optional EIDE CD-ROM installed, specify **None** in the **Drive 0** and **Drive 1 Type** setting for the Primary IDE drive section and specify **Auto** for the **Drive 0 Secondary IDE drive Type** setting. Also, ensure the optional EIDE CD-ROM is connected to the IDE2 connector on the system board.*

Operating systems that bypass the system BIOS may not obtain optimum hard-disk drive performance.

Reserved Memory	Designates a region of system board memory that can be supplied by an expansion card (known as "setting a memory hole"). Do not enable the reserved memory feature unless an expansion card that requires special addressing is installed.
CPU Speed	Indicates the processor speed at which your system boots.
Num Lock	Determines whether system boots with the <Num Lock> mode activated on keyboards (does not apply to 84-key keyboards).
Reset Button	Enables and disables the reset button.
Video DAC Snoop	Controls how VGA and graphics devices on the PCI or AGP bus respond to palette register accesses. <ul style="list-style-type: none">• On — forces VGA and graphics devices to snoop VGA palette register accesses and forward them to the ISA bus.• Off — forces VGA and graphics devices to respond positively to palette register accesses.
Processor 1 Processor 2	Displays the version or stepping number of each processor slot in the system.
Keyboard Errors	Enables or disables the reporting of keyboard errors during POST.
System Password Password Status	Displays the current status of the password security feature. Prevents the system password from being changed or disabled at system start-up.
Boot Sequence	Determines whether the system boots from diskette (if present), hard-disk, or CD-ROM. Press <Ctrl> and the right-arrow key to select the order.
Device List	Provides a list of available boot devices and boot device order.
Setup Password	Restricts access to the setup program. Overrides system password.
Auto Power On	Turns system on automatically at preset days/times. If the system is connected

to a power strip and the power strip is turned off, **Auto Power On** cannot function.

Power Management

Switches an energy-conserving monitor (DPMS) and most EIDE drives to low power mode during periods of inactivity.

 **CAUTION: Check monitor documentation to make sure monitor is a DPMS-compliant monitor. Enabling Power Management on non-DPMS monitors may damage the monitor.**

 **NOTE: Not all EIDE drives support this feature. Enabling Power Management on drives that do not support it may cause the drive to become inoperable until the system is restarted and the Power Management feature is disabled.**

Chassis Intrusion

Displays the status of the chassis intrusion monitor at system start-up. To clear **Detected** status, use the right- or left-arrow key to select **Reset**.

Mouse

Enables or disables the built-in PS/2-compatible mouse port. Disabling the mouse allows an expansion card to use IRQ 12.

Serial Port 1 Serial Port 2

Configures the built-in serial ports. Options are **Auto** (the default) to automatically configure a port, a particular designation (**COM1** or **COM3** for **Serial Port 1**; **COM2** or **COM4** for **Serial Port 2**), or **Off** (disabled).

Parallel Port

Configures the built-in parallel port. Default address is **378h**. Alternate addresses are **278h** or **3BCh**. Set to **Off** to disable the parallel port.

 **NOTE: Do not set Parallel Port to 278h if you have an Extended Capabilities Port (ECP) device connected to the port.**

Parallel Mode

Controls whether the built-in parallel port acts as an AT-compatible (unidirectional) or PS/2-compatible (bi-directional) port. Refer to the documentation that came with the device to determine correct setting.

IDE Controller

Controls integrated IDE drive controller operation. If **IDE Controller** is set to **Auto** and the system detects a drive controller card installed, the integrated IDE controller is disabled. If a drive controller card is not detected, the integrated IDE controller is enabled. When **IDE Controller** is set to **Off**, the integrated IDE controller is always disabled.

Diskette

Controls the operation of the system's built-in diskette drive controller.

Auto (the default) turns off the built-in diskette drive controller (when necessary) to accommodate a controller card installed in an expansion slot.

Write Protect prevents anything from being written to diskette drives using the system's built-in diskette drive controller. Read access is enabled. When **Write Protect** is selected, **Auto** is also selected.

Off turns off the built-in diskette controller.

Speaker

Turns the built-in speaker **On** or **Off**. A reboot is needed for a change to take effect.

SCSI

Turns the integrated SCSI controller **On** (default) or **Off**.

System Data

These fields display information about the system. These fields are not selectable.

Microprocessor

Displays type and speed of the installed microprocessor(s).

Level 2 Cache

Displays the size of the integrated cache (512 KB).

System Memory	Displays the amount of installed and detected memory, except for memory on EMS expansion cards.
Video Memory	Displays the amount of installed and detected video memory.
Service Tag	Displays the 5-character service tag number programmed into NVRAM.
Asset Tag	Displays the programmable asset tag number (if assigned).

[Back to Contents Page](#)

Abbreviations and Acronyms: Dell™ PowerEdge™ 1300 Systems Service Manual

[A](#) • [B](#) • [C](#) • [D](#) • [E](#) • [F](#) • [G](#) • [H](#) • [I](#) • [J](#) • [K](#) • [L](#) • [M](#) • [N](#) • [O](#) • [P](#) • [Q](#) • [R](#) • [S](#) • [T](#) • [U](#) • [V](#) • [W](#) • [X](#) • [Y](#) • [Z](#)

The following list contains common abbreviations and acronyms that may appear in the *Dell PowerEdge 1300 System Service Manual* files.

A

ampere(s)

AC

alternating current

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

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

EISA

Extended Industry-Standard Architecture

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

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

MMX

MultiMedia eXtensions

mm

millimeter(s)

ms

millisecond(s)

MS-DOS[®]

Microsoft[®] Disk Operating System

MTBF

mean time between failures

mV

millivolt(s)

NIC

network interface controller

NiCad

nickel cadmium

NiMH

nickel-metal hydride

NMI

nonmaskable interrupt

ns

nanosecond(s)

NTFS

NT File System

NVRAM

nonvolatile random-access memory

OS/2[®]

Operating System/2

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

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 system interface

SDS

Scalable Disk System

sec

second(s)

SEC

single-edge contact

SDRAM

synchronous dynamic random-access memory

SMB

server management bus

SNMP

Simple Network Management Protocol

SRAM

static random-access memory

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)

XMM

extended memory manager

XMS

eXtended Memory Specification

ZIF

zero insertion force

[Back to Contents Page](#)