Dell Precision™ WorkStation 620 Systems User's Guide

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NOTE: You can obtain the latest version of this document from the Dell support Web site at ***http://support.dell.com****.*

Notes, Notices, and Cautions

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

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

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

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

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Model WCP

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Using the Integrated Audio Controller: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- Connecting Audio Devices
- Adjusting Volume
- Using Audio Utilities
- Installing Audio Drivers

Overview

This section describes how to connect your computer system to external audio devices that use the 32-bit integrated audio controller on your computer's system board.

The integrated Crystal SoundFusion CS4614 Peripheral Component Interconnect (PCI) audio controller is Sound Blaster Pro-compatible and supports Microsoft® DirectSound, DirectSound3D, and wavetable synthesis. The CS4614 controller has a Sound Retrieval System (SRS) 3D stereo digital signal processing (DSP) engine that retrieves and restores spatial sound information, directional cues, and other sonic nuances that are typically missing or are altered by electronic reproduction of stereo sound.

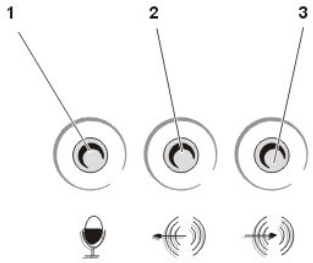
This section also describes the audio application programs that Dell has installed on your hard-disk drive, and it tells you how to reinstall audio drivers if necessary.

NOTE: The instructions in this section apply to systems using the integrated audio controller. If you are using a sound card, use the connection instructions in the documentation that came with your sound card.

Connecting Audio Devices

You can connect a variety of audio devices to your computer. Use Figure 1 to locate the audio connectors on the input/output (I/O) panel on the back of your computer.

Figure 1. Audio Connectors



1 Microphone jack
2 Audio line-out jack
3 Audio line-in jack

Before you use any audio device, be sure that **Sound** in the System Setup program is set to **On** (the default).

Speakers

Your computer system supports most standard speakers that have integrated amplifiers. You can purchase speakers separately from Dell.

Connect the audio cable from the speakers to the audio line-out jack (see Figure 1).

NOTES: The audio line-out jack has a mechanical switch that detects when external speakers are plugged in. If no external speakers are plugged in, then all sound, including sounds from the operating system, is routed to the internal monophonic speaker. If external speakers are plugged in, then all sound, including the PC beep, is routed through the audio line-out jack to the external speakers. Sound is never routed to the internal speaker and external speakers simultaneously.

*The **Sound** option in the System Setup program turns the audio controller on and off. When **Sound** is set to **Off**, neither the external speakers nor the internal speaker produce sound.*

*The **PC Speaker** option in the System Setup program enables or disables the legacy PC beep. It does not turn the internal monophonic speaker on or off. The basic input/output system (BIOS) beep codes are always audible regardless of this option setting.*

Microphones

Your computer system supports most standard personal computer microphones. You can purchase a microphone separately from Dell.

NOTE: Do not use standard microphones. Use only microphones designed for use with computers.

Connect the microphone's audio cable to the microphone jack (see Figure 1).

Recording and Playback Devices

Your computer system supports a variety of recording and playback devices such as cassette players, CD players, radios, stereo systems, VCRs, and tape players.

Connect the line-out cable from any one of these devices to the audio line-in jack on the back of your computer (see Figure 1).

CD-ROM Drives

To use an internal CD-ROM drive with the integrated audio controller, perform the following steps:

1. Install the CD-ROM drive in your computer.

   For instructions on installing a CD-ROM drive that uses the computer's enhanced integrated drive electronics (EIDE) interface, see "Installing a Drive in a 5.25-Inch Drive Bay."

   For instructions on installing a small computer system interface (SCSI) CD-ROM drive, see "Installing SCSI Devices."

2. Connect the audio cable from the CD-ROM drive to the CD-ROM drive audio connector on the system board.

See Figure 1 in "Installing System Board Options" for the location of the CD-ROM drive audio connector (CD-IN) on the system board.

*NOTES: The integrated audio controller allows you to manipulate musical instrument digital interface (MIDI) files on your computer and to hear output from those files on external speakers. However, to communicate with an external MIDI device, such as a synthesizer or other musical instrument, you must install a MIDI-compatible expansion card. If you use a MIDI card, set **Sound** in the System Setup program to **Off**.*

*To use a joystick, install a joystick-compatible expansion card in your computer. If you use a joystick card with sound capabilities, set **Sound** in the System Setup program to **Off**.*

Aux-In

Your computer system supports analog input from DVD decoder and TV tuner expansion cards.

Connect the data cable from either expansion card to the white AUX pocket connector on the system board.

TAPI

Your computer system allows a voice modem to interface with the integrated audio system.

Connect the voice modem data cable to the green Telephony Application Programming Interface (TAPI) pocket connector on the system board.

Adjusting Volume

Use the instructions in the following subsections to adjust the speaker balance and volume of an audio source that uses the integrated audio controller in your Dell™ computer or to mute the internal speaker.

Adjusting Volume in the Microsoft Windows NT® 4.0 Operating System

1. Double-click the speaker icon in the Windows NT task bar to open the **Master Out** volume control.
2. Adjust the **Master Out** slide controls labeled **Volume** and **Balance** to adjust the volume and balance for all devices, or adjust the slide controls for an individual device.

For detailed instructions on adjusting the volume, see your Windows NT documentation.

Muting the Legacy PC Beep

NOTE: Muting the internal speaker only mutes the computer system generated beep codes. The internal speaker is automatically disabled when external speakers are plugged in.

To mute the internal speaker, perform the following steps:

1. Enter the System Setup program.
2. Set **PC Speaker** to **Off**.

3. Restart your computer system.

Using Audio Utilities

The operating system installed on your Dell system has its own utilities for playing audio CDs and recording or playing **.wav** files:

- For Windows NT 4.0, use **Sound Recorder** to control the input of devices from which you are recording **.wav** data. **Record** allows you to adjust your selected audio input device.
- Use the **Master Out** volume control to adjust sound levels from several different audio sources.

For detailed instructions for using either device, see your Windows NT documentation.

Installing Audio Drivers

Dell installed your system's audio drivers, and they are operative when you receive the system—no further installation or configuration is needed. For information on reinstalling these drivers, see the documentation that accompanies the *Dell Precision ResourceCD*.

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Basic Checks: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- Backing Up Your Files
- Basic Checks
- Checking Connections and Switches
- Look and Listen
- System Setup

Overview

If your Dell™ computer system is not working as expected, and if you are not sure what to do, start your troubleshooting with the procedures in this section. This section guides you through basic steps to solve basic computer problems. It also directs you to further detailed troubleshooting information and procedures to solve more complex problems.

Backing Up Your Files

If your system is behaving erratically, back up your files immediately. If your system has a tape drive installed, see the documentation that came with the tape backup software for instructions on performing a backup operation. Otherwise, see your operating system documentation for information on backing up data files.

Basic Checks

See the following sections in the order indicated until the problem is resolved:

- If your computer is wet or damaged, see "Troubleshooting a Wet Computer" or "Troubleshooting a Damaged Computer."
- Perform the steps in "Checking Connections and Switches."
- Perform the steps in "Look and Listen."
- If your system did not complete the boot (start-up) routine, see "Getting Help."

  NOTE: The boot routine is the operating system's attempt to load its files into memory from the boot-up sector on the hard-disk drive or another bootable device.

- If your system displayed a message or emitted a beep code, see "Messages and Codes."
- Verify the settings in System Setup.
- Run the Dell Diagnostics.

Checking Connections and Switches

Improperly set switches and controls and loose or improperly connected cables are the most likely source of problems for your computer, monitor, or other peripheral (such as a printer, keyboard, mouse, or other external equipment).

NOTE: See "Hardware Configuration " for the location of your computer's external connections and switches.

To check all connections and switches, perform the following steps:

1. Turn off the computer system, including any attached peripherals.

   Disconnect all the AC power cables from their electrical outlets.

2. If your computer is connected to a power strip, turn the power strip off and then on again. If the problem is not resolved, try another power strip or connect the system directly to an electrical outlet to see if the original power strip is faulty.

3. Connect the system to a different electrical outlet.

   If doing so corrects the problem, the original outlet is faulty.

4. Reconnect the system to an electrical outlet. Make sure that all connections fit tightly together, and turn on the system.

5. If the problem is resolved, you have corrected a faulty connection.
6. If your monitor is not operating properly, see "Troubleshooting the Monitor."
7. If your keyboard is not operating properly, see "Troubleshooting the Keyboard."
8. If your mouse or printer is not operating properly, see "Troubleshooting I/O Ports." Otherwise, see "Look and Listen."

Look and Listen

Looking at and listening to your system is important in determining the source of a problem. Look and listen for the indications described in Table 1.

If after looking and listening to your computer you have not resolved the problem, continue with the recommendations in "System Setup."

Table 1. Boot Routine Indications

Look/Listen for:	Action
An error message	See "Messages and Codes."
The monitor's power indicator	Most monitors have a power indicator (usually on the front bezel). If the monitor's power indicator does not light up, see "Troubleshooting the Monitor."
The system power indicator	Use the power indicator to help you identify a system problem when you press the power button to turn on the computer but the system does not boot: • A blinking yellow power indicator before power-on self-test (POST) indicates that the power supply may be faulty. In rare cases, the system board may be faulty. See "Getting Help" for instructions on getting technical assistance from Dell. • A solid yellow power indicator before POST indicates that a device on the system board may be faulty or is incorrectly installed. Be sure that the microprocessor is properly seated, remove all expansion cards, and then reboot. If the system does not boot, see "Getting Help" for instructions on getting technical assistance from Dell. • A solid green power indicator and a beep code during POST indicate that a Rambus in-line memory module (RIMM) may be faulty or is not properly seated. Remove all RIMMs and reinstall them. If the problem persists, remove the pair of RIMMs in the highest numbered socket pair and move the pair of Rambus Continuity Modules (C-RIMM) modules to the lowest numbered empty socket pair, and then reboot. Repeat this procedure until you identify the faulty or improperly seated RIMM. Otherwise, if you have a spare pair of RIMMs, replace an existing pair of RIMMs with the spare pair, and then reboot. Repeat this procedure with each pair of RIMMs until you identify the faulty or improperly seated RIMM. • A solid green power indicator, no beep code, and no video during POST indicate that the monitor or the integrated video controller may be faulty. See "Troubleshooting the Monitor." If the monitor is operating properly and is correctly connected, see "Getting Help" for instructions on getting technical assistance from Dell. • A solid green power indicator and no beep code with video during POST indicate that an integrated system board device may be faulty. See "Getting Help" for instructions on getting technical assistance from Dell.
The keyboard indicators	Most keyboards have one or more indicators (usually in the upper-right corner). Press the <Num Lock> key, the <Caps Lock> key, and the <Scroll Lock> key to toggle the keyboard indicators on and off. If the keyboard indicators do not light up, see "Troubleshooting the Keyboard."
The diskette-drive access indicator	The diskette-drive access indicator should quickly flash on and off when you access data on the diskette drive. On a system running a Microsoft® Windows® operating system, you can test the drive by opening Windows Explorer and clicking the icon for drive A. If the diskette-drive access indicator does not light up, see "Troubleshooting Drives."
The hard-disk drive access indicator	The hard-disk drive access indicator should quickly flash on and off when you access data on the hard-disk drive. On a system running a Windows operating system, you can test the drive by opening Windows Explorer and clicking the icon for drive C. If the hard-disk drive access indicator does not light up, see "Troubleshooting Drives."
A series of beeps	See "Messages and Codes."
An unfamiliar constant scraping or grinding sound when you access a drive	Make sure that the sound is not caused by the application program you are running. The sound could be caused by a hardware malfunction. See "Getting Help" for instructions on getting technical assistance from Dell.
The absence of a familiar sound	When you turn on your system, you can hear the hard-disk drive spin up, and the system tries to access the boot files from the hard-disk drive or the diskette drive. If your system boots, see "Dell Diagnostics." If your system does not boot, see "Getting Help."

System Setup

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

This problem can happen if you changed your system's hardware configuration and forgot to run System Setup. To correct this problem, enter System Setup, correct the setting for the corresponding System Setup program option, and reboot your system.

If after checking the settings in System Setup you have not resolved the problem, see "Dell Diagnostics."

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Installing System Board Options: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- Expansion Cards
- Adding Memory
- Removing and Installing a Memory Expansion Card
- Microprocessor Upgrades
- SuprFreq Utility Program
- Replacing the System Battery

Overview

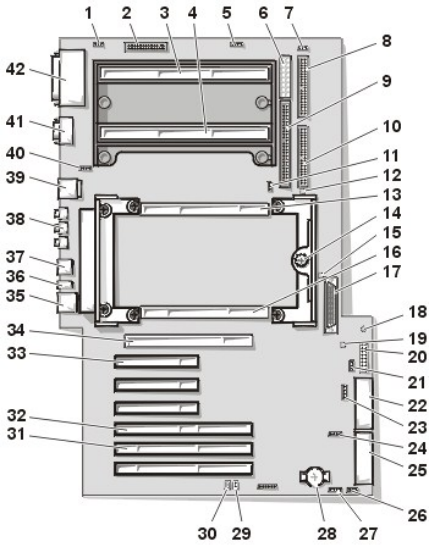
This section describes how to install the following options:

- Peripheral Component Interconnect (PCI) and accelerated graphics port (AGP) expansion cards
- System memory
- Microprocessor single-edge contact (SEC) cartridge

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

Use Figure 1 to locate the system board features.

Figure 1. System Board Features



1 Processor fan connector
2 Diskette-drive connector
3 Slot 2 processor 0 socket
4 Slot 2 processor 1 socket
5 CD-ROM drive audio connector
6 Bay power connector
7 Processor 0 fan connector
8 Secondary EIDE connector
9 Narrow SCSI connector
10 Primary EIDE connector
11 Processor 1 fan connector
22 MT power 2 connector
23 Auxiliary audio input connector
24 Auxiliary-drive access connector
25 MT power 1 connector
26 Card-cage fan connector
27 Telephony (TAPI) connector
28 Battery
29 RTCRST jumper
30 Password jumper
31 64-bit PCI expansion-card connector (2)
32 32-bit PCI/RAID expansion-card connector

12 Processor mismatch LED

13 Memory expansion card B connector

14 System board thumbscrew

15 Suspend to RAM LED

16 Memory expansion-card A connector

17 LVD SCSI connector

18 Standby power LED

19 Memory expansion-card mismatch LED

20 Control panel connector

21 Remote wakeup LAN connector

33 32-bit PCI expansion-card connectors (3)

34 AGP Pro graphics card connector

35 Network connector

36 Diagnostic LEDs

37 USB connectors

38 Microphone, audio-in, and audio-out connectors

39 Keyboard and mouse connectors

40 System fan connector

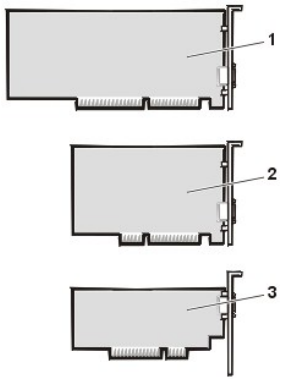
41 Serial port connectors 1 and 2

42 Parallel port and SCSI port connectors

Expansion Cards

The computer system accommodates up to six expansion cards (two 64-bit and four 32-bit PCI expansion cards), one 32-bit AGP Pro card, and one 32-bit PCI/redundant array of independent disks (RAID) port. See Figure 2 for examples of the expansion cards.

Figure 2. Expansion Cards



1 64-bit PCI expansion card

2 32-bit PCI expansion card

3 32-bit AGP expansion card

Expansion Slots

The Dell Precision 620 system provides six PCI 2.2-compliant expansion slots on two peer buses. Four 32-bit slots (1, 2, 3, and 4) are on the primary PCI bus. One or two of these slots may be used with the AGP Pro connector. Slot 4 is shared with the RAID port function. Two 64-bit slots (5 and 6) are on the secondary PCI bus.

You can install a properly keyed universal PCI expansion card in either the 32-bit (5-volt [V], 33-megahertz [MHz]) or 64-bit (3.3-V, 66- or 33-MHz) PCI expansion slots. Either of the 64-bit expansion slots will accept a properly keyed 32-bit expansion card without affecting the other 64-bit expansion slot; however, if you install a 33-MHz expansion card in either 64-bit expansion slot, the other 64-bit expansion slot operates at 33 MHz also.

NOTE: There are no Industry-Standard Architecture (ISA) slots provided.

Installing an Expansion Card

NOTE: If you install a PCI expansion card, your system automatically performs any required configuration tasks during the boot routine.

NOTICE: See "Protecting Against Electrostatic Discharge" in your *Dell Precision WorkStations System Information Guide*.

1. Prepare the expansion card for installation, and remove the computer cover.

   See the documentation that came with the expansion card for information on configuring the card, making internal connections, and customizing it for your system.

   CAUTION: Some network cards automatically start up the system when they are connected. To guard against electrical shock and to avoid damaging electrical components, perform the following steps before you install any expansion cards:

   a. **Disconnect the external power cable at the back of the system.**

   b. **Disconnect any network cables and phone lines.**

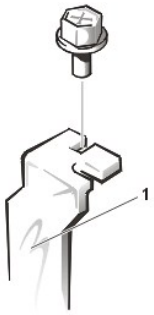
c. Verify that the standby power light-emitting diode (LED) is off. See Figure 1 for the location of this LED.

2. Remove the AGP card brace according to the instructions in "Removing and Replacing the AGP Card Brace."
3. Unscrew and remove the metal filler bracket that covers the card-slot opening for the expansion slot you intend to use (see Figure 3).

   Save the screw to use when you install the expansion card later in this procedure.

   NOTE: If you install an AGP Pro (4X) Graphics adapter expansion card, you may need to remove up to three adjacent metal filler brackets depending on the configuration of the expansion card.

Figure 3. Removing the Filler Bracket



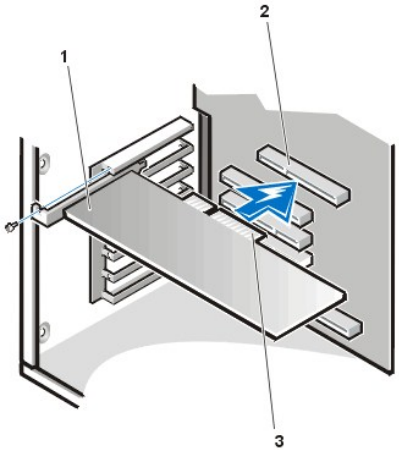
1 Filler bracket

4. Insert the expansion card into the expansion-card connector.

   If the expansion card is full-length, insert the front end of the card into the corresponding card guide on the inside front of the chassis as you insert the card into its connector.

   Insert the card-edge connector firmly into the expansion slot. Gently rock the card into the connector until it is fully seated (see Figure 4).

Figure 4. Installing an Expansion Card



1 Expansion card

2 Card-edge connector

3 Expansion-card connector

5. When the card is firmly seated in the connector, secure the card's mounting bracket to the chassis with the screw that you removed in step 3.
6. Connect any cables that should be attached to the card.

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

7. Replace the AGP card brace.
8. Replace the computer cover, reconnect the network cable and phone line if present, reconnect your computer and peripherals to their electrical outlets, and turn them on.

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

ALERT! Cover was previously removed.

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

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

Removing an Expansion Card

NOTICE: See "Protecting Against Electrostatic Discharge" in your *Dell Precision WorkStations System Information Guide*.

1. Remove the computer cover.
2. Remove the AGP card brace according to the instructions in "Removing and Replacing the AGP Card Brace."
3. Disconnect any cables connected to the card.
4. Unscrew the mounting bracket of the card you want to remove.
5. Grasp the card by its outside corners, and ease it out of its connector.
6. If you are removing the card permanently, install a metal filler bracket over the empty card-slot opening.

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

7. Replace the AGP card brace.
8. Replace the computer cover, reconnect your computer and peripherals to their electrical outlets, and turn them on.

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

ALERT! Cover was previously removed.

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

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

Adding Memory

Dell Precision 620 systems support dual direct Rambus dynamic random-access memory (RDRAM) channels. The channels are designated as memory expansion cards (MEC) A and B. Rambus in-line memory modules (RIMMs) feature error checking and correction (ECC).

Dell Precision 620 systems support a maximum of 8 RIMMs (4 RIMMs per MEC) for up to 2 gigabytes (GB) of total memory.

NOTE: The memory module in each socket on one MEC must be the same memory capacity, number of components, and speed as the corresponding memory module in the same socket on the other MEC.

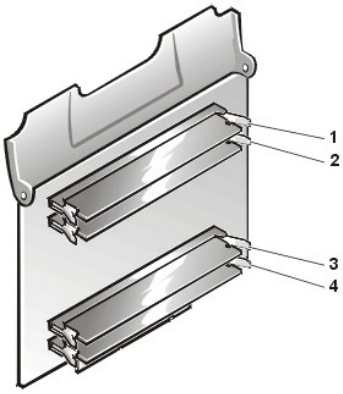
When you add system memory (RIMMs), you must fill the memory module sockets with *pairs* of memory modules of equal memory capacity, number of components, and speed. Install one memory module of each pair in the corresponding numbered socket on each MEC.

NOTES: When you add RIMMs, you must install the memory module pairs in the following sequence: RIMM2_A, RIMM1_A, RIMM3_B, and RIMM4_B or (see Figure 5). If socket RIMM1_A is empty, you must install a Rambus Continuity Module (C-RIMM) in that socket on each MEC. If RIMM2_A through RIMM3_B contain RIMMs, but socket RIMM4_B is empty, you must install a C-RIMM in that socket on each MEC.

If you are installing 512-MB RIMMs, you must install the memory module pairs in the following sequence: RIMM3_B, RIMM4_B, and RIMM2_A. You must also install a C-RIMM in socket RIMM1_A.

Also, you cannot mix 288- and 144-MB technology in the upper two sockets of each memory riser.

Figure 5. RIMM Socket Sequence



1 RIMM1_A
2 RIMM2_A
3 RIMM3_B
4 RIMM4_B

To add memory, perform the following steps.

NOTICE: See "Protecting Against Electrostatic Discharge" in your *Dell Precision WorkStations System Information Guide*.

1. Remove the computer cover.
2. Determine the memory module sockets in which you will install modules or replace existing modules.
3. Rotate the green MEC cover up to lift the MEC up from the system board, and remove the MEC from the system. See "Removing and Installing a Memory Expansion Card."
4. Repeat step 3 for the other MEC.
5. Install or replace the memory modules as necessary to reach the desired memory total.

   NOTICE: To avoid damage to the memory modules, press the module straight down into the socket with equal force applied at each end of the module.

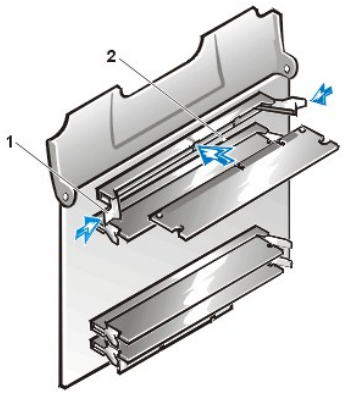
   To install a memory module, perform the following steps:

   a. Locate the plastic securing clips at each end of the socket (see Figure 7). Press the clips outward until they snap open.

   b. Press the memory module straight into the slot running down the center of the socket until the securing tabs snap into place around the ends of the memory module.

NOTICE: Do not leave empty sockets between RIMMs. After you install the last RIMM, insert a C-RIMM in socket RIMM1_A or RIMM4_B, whichever is the lowest-numbered empty socket, on each MEC.

Figure 7. Installing a RIMM

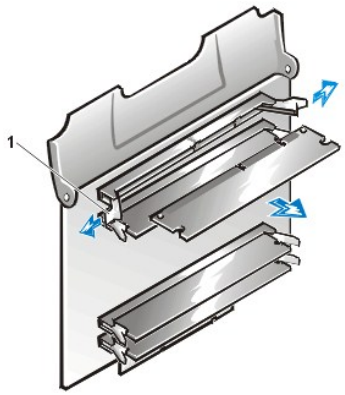


1 Securing clips (2)
2 Slot

To remove a memory module, press the securing clips outward simultaneously until the module disengages from the socket (see Figure 8). It should pop out slightly.

NOTICE: To avoid damage to the memory module, press the securing clips with equal force applied at each end of the socket.

Figure 9. Removing a RIMM



1 Securing clips (2)

6. Reinstall both MECs on the system board. See "Removing and Installing a Memory Expansion Card."
7. Replace the computer cover, reconnect your computer and peripherals to their electrical outlets, and turn them on.

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

   ALERT! Cover was previously removed.

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

   The amount of system memory has changed.

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

8. Press <F2> to enter the System Setup program, and check the value for **System Memory** in the lower-right corner of Page 1.

   The system should have already changed the value of **System Memory** to reflect the newly installed memory. Verify the new total.

   NOTE: If the memory total is incorrect, repeat steps 1 through 3. Verify that the installed memory modules are securely seated in their sockets on the MECs, and that the MECs are securely seated in the system board. Then repeat steps 7 and 8.
9. While in System Setup, reset the chassis intrusion detector by selecting **System Security**, and changing **Chassis Intrusion** to **Enabled, Enabled-Silent,** or **Disabled**.

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

10. When the system memory total is correct, press the <Esc> key to exit the System Setup program.
11. Run the Dell Diagnostics to verify that the memory modules are operating properly.

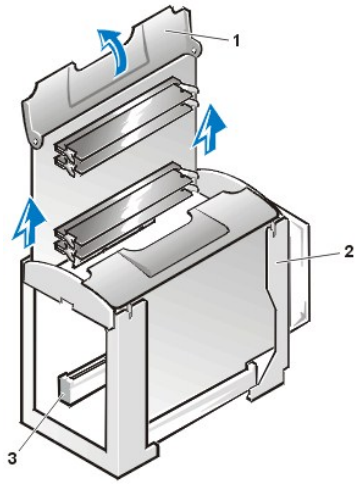
Removing and Installing a Memory Expansion Card

NOTICE: See "Protecting Against Electrostatic Discharge" in your *Dell Precision WorkStations System Information Guide*.

To remove a MEC, perform the following steps:

1. Remove the computer cover.
2. Rotate the green MEC cover up until it frees the MEC from its socket (see Figure 11.) Pull the MEC from the system.

Figure 11. Removing a Memory Expansion Card



1 MEC Cover

2 MEC guide

3 MEC socket

3. Repeat step 2 for the second MEC.

To reinstall a MEC, perform the following steps:

1. Remove the computer cover.
2. Insert the MEC into the MEC socket on the system board. Press firmly on the MEC until it clicks.
3. Rotate the green MEC cover to the closed position to secure the MEC in the socket.
4. Repeat steps 2 and 3 for the second MEC.
5. Replace the computer cover, reconnect your computer and peripherals to their electrical outlets, and turn them on.

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

   ALERT! Cover was previously removed.

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

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

Microprocessor Upgrades

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

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

NOTE: Only the Microsoft® Windows NT® version 4.0 and Windows 2000® and higher operating systems support dual processors.

Downloading Instructions for Installing Dual Processor Support

1. Go to **http://support.dell.com**.
2. Complete the one-time registration process if you have not already done so.
3. Click **Dell Knowledge Base** under **Support Tools**, enter `second processor` in the **Search Documents by Words in Title** option, and click **Go**.
4. Click the document title that corresponds to the operating system you are running.

Each processor and its associated level-2 (L2) cache memory are contained in a single-edge contact (SEC) cartridge that is installed in a dedicated connector (PROC_0 or PROC_1) on the system board. In systems with only one processor, a terminator card is installed in the second processor connector. The following subsection describes how to install or replace an SEC cartridge in either the first or second processor connector.

Adding or Replacing a Microprocessor

The following items are included in a processor upgrade kit:

- SEC cartridge with attached heat sink
- Two heat-sink securing thumbscrews

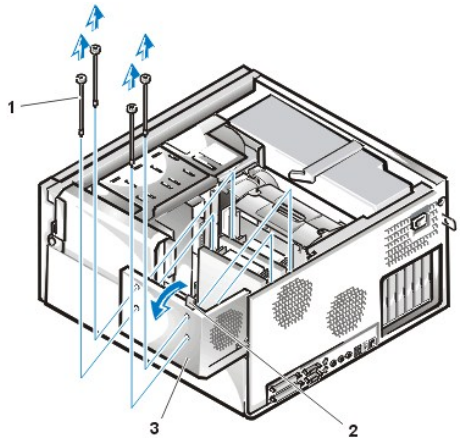
To add or replace an SEC cartridge, perform the following steps.

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

NOTICE: See "Protecting Against Electrostatic Discharge" in your *Dell Precision WorkStations System Information Guide*.

1. Remove the computer cover.
2. Using a Phillips-head screwdriver, remove the four large thumbscrews in the processor retention bracket.
3. Press and release the release latch on the processor retention bracket and rotate the retention bracket to its raised position (see Figure 12).

Figure 12. SEC Cartridge/Heat Sink Assembly Removal

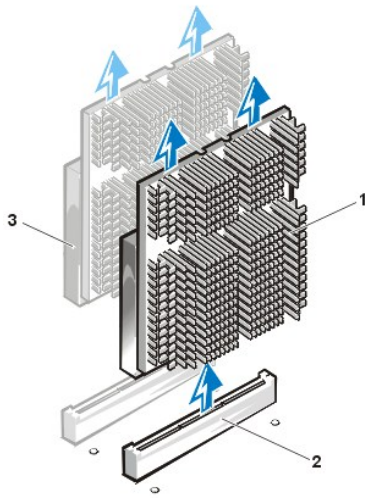


1 Thumbscrews (4)
2 Securing tab
3 Processor cover

4. If you are adding a second processor to a single-processor system, remove the terminator card from the second SEC cartridge connector (labeled "PROC_0" or "PROC_1") by pulling the terminator card straight out to release it from the connector.
5. If you are replacing an installed processor, remove the processor by performing the following steps:
   a. Unplug the processor fan wire from the system board (see Figure 1).
   b. Grasp the installed SEC cartridge/heat sink assembly firmly and pull it away from the guide bracket assembly (see Figure 13).

NOTE: You must use up to 15 pounds (lb) of force to disengage the SEC cartridge from the connector.

Figure 13. SEC Cartridge/Heat Sink Assembly Removal



1 CPU Fan

2 SEC cartridge connector

3 Processor/heat sink assembly

6. Press the new SEC cartridge/heat sink assembly firmly into the system board connector until it is fully seated. Then reconnect the processor fan to the processor fan connector on the system board.

NOTES: You must use up to 25 lb of force to fully seat the SEC cartridge in its connector.

To test if the new SEC cartridge/heat sink assembly is installed correctly, plug in the power cord. The processor mismatch LED will turn amber if the processor is not correctly seated. See Figure 1 for the location of this LED. Unplug the power cord after checking the LED.

7. Rotate the processor retention bracket back to its closed position, and ensure that it is securely latched.
8. Using a Phillips head screwdriver, reinstall the four large thumbscrews in the recessed holes on the processor retention bracket.
9. Replace the computer cover, reconnect your computer and peripherals to their electrical outlets, and turn them on.

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

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

   ALERT! Cover was previously removed.

10. Enter System Setup, and confirm that the system data area correctly identifies the type and number of installed processor(s).
11. While in System Setup, reset the chassis intrusion detector by selecting **System Security**, and changing **Chassis Intrusion** to **Enabled, Enabled-Silent,** or **Disabled**.

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

12. If you installed a second processor and your system is running Microsoft Windows NT 4.0, reinstall the operating system.

See your Windows NT documentation for instructions.

When you reinstall Windows NT 4.0, the operating system detects the second processor.

NOTE: If your Windows NT 4.0 operating system was installed by Dell, you do not need to reinstall it.

13. Run the Dell Diagnostics to verify that the new processor is operating correctly.

See "Troubleshooting" for information on running the diagnostics and troubleshooting any problems that may occur.

SuprFreq Utility Program

SuprFreq is an MS-DOS® utility program used to correctly set the processor(s) core frequency based on a multiplier ratio of the front side bus (FSB) frequency. The SuperFreq program provides options for selecting the correct multiplier ratio that the input/output (I/O) controller hub provides to the processor(s) to set the speed.

CAUTION: Before you complete following procedure, it is important for your personal safety and for protection of your equipment that you make sure the AC power has been completely removed from the system board. Turn off and unplug the computer from the electrical outlet and wait 15 to 30 seconds, see Safety First—For You and Your Computer, and make sure the standby power light-emitting diode (LED) on the system board has turned off (see Figure 1 for the location of the LED).

When the SuprFreq Utility Program is Required

Run the SuperFreq utility program if your system's processor(s) core frequency is set incorrectly (see Determine System Processing Speed). Incorrect settings can occur when you do one of the following:

- Upgrade your Dell system processor(s).
- Replace the system board.
- Lose the system CMOS nonvolatile random-access memory (NVRAM) settings because of a bad coin-cell system battery.

Determine System Processing Speed

1. Enter System Setup (see Entering System Setup).

   The **System Setup** screen displays the current setup and configuration information and optional settings for your system.

2. Read the system processor(s) speed listed below the system name at the top of the **System Setup** screen.

Determine Processor(s) Maximum Core Speed

See Safety First—For You and Your Computer before completing the following steps.

1. Unplug the computer system.
2. Remove the computer cover (see Removing the Computer Cover).
3. Using a Phillips-head screwdriver, remove the four large thumbscrews in the processor retention bracket.
4. Press and release the release latch on the processor retention bracket and rotate the retention bracket to its raised position (see Figure 12).
5. Read the identification label on the top of the processor cartridge(s) to determine the maximum core speed.

   For example: The number 800 in the identification label "80526KZ800256 2.8V" indicates an 800 megahertz (MHz) core speed (the 256 and 2.8V portion of the identification label represents 256 kilobytes [KB] of cache and a 2.8-volt processor cartridge, respectively) (see Figure 14).

Figure 14. Processor Cartridge Label

Compare System Processor(s) Speed with Processor(s) Maximum Core Speed

Run the SuprFreq utility program if the system processor(s) speed does not match the processor(s) maximum core speed.

NOTE: No action is required if the system processor(s) speed matches the processor(s) maximum core speed.

Downloading the SuprFreq Utility Program

1. Go to **http://support.dell.com**.

   If you have not created a profile for your specific system, do so now by creating a system profile in step 1. Enter the system service tag or the express service code, or select the Dell system model number from the dropdown menu. Click **Go!** in step 3 to proceed to your system's support page.

   NOTE: The file format as listed in the support page consists of diskette images that must be downloaded to your hard-disk drive, and then extracted onto diskettes. The installation is then done from the diskettes.

2. Click **Downloads** on the menu bar at the top of the page.

   Enter the file name **sprfrq2.exe** in the **Search For Files by Exact File Name** option, and click **Retrieve**.

3. Download the SuprFreq utility application program to your hard-disk drive.
4. Insert a formatted diskette into drive a:\.

5. Double-click the SuprFreq self-extracting application.
6. Click **Setup** in the dialog box, and follow the steps in the DOS window to extract the utility files to the diskette.

Running the SuprFreq Utility Program

1. Insert the diskette containing the SuprFreq utility files.
2. Boot the system using the utility diskette.

   The following menu appears.

   NOTE: Menu instructions may vary depending on the processor speed.

   ```
   1. Dell WS620 with 733 MHz Processor(s).

   2. Dell WS620 with 800 MHz Processor(s).

   3. Review the readme file.

   Choose your processor(s) speed[1,2,3]?
   ```

3. Type 3 to view the **readme.txt** file.

   To reset your system's processor core frequency, type 1 or 2 depending on your processor's maximum core speed, and press <Enter> (see Determine Processor(s) Maximum Core Speed).

   NOTICE: If you select a faster speed option than the speed of your processor(s) and you reset the system, your system will not boot. You will have to reset the processor(s) speed manually (see Resetting the Processor Speed Manually).

4. After a speed selection is entered, the following message appears:

   Update Successful

5. Remove the diskette from drive a:\ and turn off your system. Wait 15-30 seconds, and reboot the computer.
6. To verify the operation, see Determine System Processing Speed.

Resetting the Processor Speed Manually

CAUTION: Before you complete the following procedure it is important for your personal safety and for protection of your equipment that you make sure the AC power has been completely removed from the system board. Turn off and unplug the computer from the electrical outlet and wait 15 to 30 seconds, see Safety First—For You and Your Computer, and make sure the standby power LED on the system board has turned off (see Figure 1 for the location of the LED).

1. Unplug the computer.
2. Remove the computer cover (see Removing the Computer Cover).
3. Place a jumper shunt (bypass) on the RTCRST jumper (see Figure 2).

   Make a copy of your system configuration information in the System Setup. Refer to your written or printed copy of the system configuration information to restore the correct settings after resetting the processor speed.

   NOTE: The RTCRST jumper resets the real-time clock and the NVRAM settings when jumpered.

4. Remove the coin-cell system battery.

   Pry the battery out of its socket with your fingers or with a blunt, nonconductive object such as a plastic screwdriver (see Figure 15).

5. Turn the system battery over (plus [+] side down) and reinstall.
6. Remove the system battery.
7. Turn the system battery over (plus [+] side up) and reinstall.
8. Remove the jumper shunt on the RTCRST jumper.
9. Boot the system to DOS using your system's DOS diskette.
10. Run the SuprFreq utility program to set the correct frequency for the processor(s) (see Running the SuperFreq Utility).
11. Enter the System Setup program, and confirm that the battery is operating properly.

Enter the correct time and date through the System Setup program's **Time** and **Date** options. Also, restore the correct settings for the system configuration information using the copy made in step 3.

12. Boot your system.

    The system's processor(s) core frequency is reset to the speed option selected.

Replacing the System Battery

A 3.0-V CR2032 coin-cell battery installed on the system board maintains system configuration, date, and time information in a special section of memory.

The operating life of the battery can extend up to 3.5 years. However, you may need to replace the battery if an incorrect time or date is displayed during the boot routine along with a message such as:

Coin cell battery voltage is low

or

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

or

Invalid configuration information -

please run SETUP program

or

Strike the F1 key to continue,

F2 to run the setup utility.

To determine whether you need to replace the battery, restart your system. If the battery is low, the system displays another warning message.

You can operate your system without a battery; however, without a battery, the system configuration information maintained by the battery is erased if the system is unplugged or AC power is lost. In this case, you must enter the System Setup program and reset the configuration options.

To replace the system battery with another CR2032 coin-cell battery, perform the following steps.

CAUTION: A new battery may explode 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. Make a copy of your system configuration information in the System Setup.

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

NOTICE: See "Protecting Against Electrostatic Discharge" in your *Dell Precision WorkStations System Information Guide*.

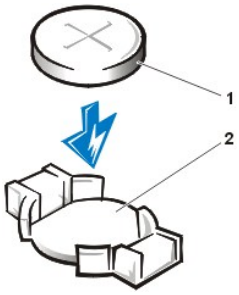
2. Remove the computer cover.
3. To access the battery on the system board, rotate the power supply as described in "Rotating the Power Supply Away From the System Board."

   The battery is mounted in a socket labeled "BATTERY" at the bottom front corner of the system board (see Figure 1).

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

4. Pry the battery out of its socket with your fingers or with a blunt, nonconductive object (see Figure 15).

Figure 15. System Battery and Battery Socket



1 Battery

2 Battery socket

5. Install the new battery.

   Orient the battery with the side labeled "+" facing up. Then insert the battery into the socket, and snap it into place.

6. Rotate the power supply back into position, making sure that the securing tab snaps into place (see "Rotating the Power Supply Away From the System Board").

7. Replace the computer cover, and reconnect your computer and peripherals to their electrical outlets and turn them on.

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

   ALERT! Cover was previously removed.

8. Enter the System Setup program, and confirm that the battery is operating properly.

   Enter the correct time and date through the System Setup program's **Time** and **Date** options. Also, restore the correct settings for the system configuration information using the copy made in step 1.

9. While in System Setup, reset the chassis intrusion detector by selecting **System Security**, and changing **Chassis Intrusion** to **Enabled, Enabled-Silent,** or **Disabled**.

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

10. Turn off your computer, and unplug it for at least 10 minutes.

11. After 10 minutes, plug in and turn on the computer, and enter the System Setup program.

    If the time and date are still incorrect, see "Getting Help."

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Contacting Dell: Dell Precision™ WorkStation 620 Systems User's Guide

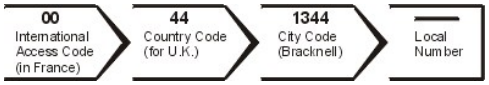
- Overview
- International Dialing Codes
- Americas Contact Numbers
- Europe Contact Numbers
- Asia and Other Regions Contact Numbers

Overview

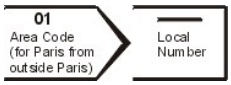
When you need to contact Dell, use the telephone numbers, codes, and electronic addresses provided in the following sections. "International Dialing Codes" provides the various codes required to make long-distance and international calls. "Americas Contact Numbers," "Europe Contact Numbers," and "Asia and Other Regions Contact Numbers" provide local telephone numbers, area codes, toll-free numbers, 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 "International Dialing Codes," in addition to the local numbers provided in the other sections.

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.

NOTES: 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.

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

International Dialing Codes

Click a listed country to obtain the appropriate contact numbers.

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)	00	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 (Cherrywood)	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)	00	47	Not required
Poland (Warsaw)	011	48	22
Portugal	00	35	—
Singapore (Singapore)	005	65	Not required
South Africa (Johannesburg)	09/091	27	11
Spain (Madrid)	00	34	91
Sweden (Upplands Vasby)	00	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

Americas Contact Numbers

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Brazil	Customer Support, Technical Support		toll free: 0800 90 3355
	Sales		toll free: 0800 90 3366
	Web site: **http://www.dell.com/br**		
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
Chile (Santiago) *NOTE: Customers in*	Sales, Customer Support, and Technical Support		toll free: 1230-020-4823

Chile call the U.S.A. for sales, customer, and technical assistance			
Latin America *NOTE: Customers in Latin America call the U.S.A. for sales, customer, and technical assistance.*	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
Mexico *NOTE: Customers in Mexico call the U.S.A. for access to the Automated Order-Status System and AutoTech.*	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	525	228-7878
	Main	525	228-7800
U.S.A. (Austin, Texas)	Automated Order-Status System		toll free: 1-800-433-9014
	AutoTech (for portable and desktop computers)		toll free: 1-800-247-9362
	Dell Home and Small Business Group (for portable and desktop computers):		
	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	512	338-4400

Europe Contact Numbers

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Austria (Vienna) *NOTE: Customers in Austria call Langen, Germany for Technical Support and Customer Care.*	Switchboard	01	491 040
	Home/Small Business Sales	01	795676-02
	Home/Small Business Sales Fax	01	795676-05
	Home/Small Business Customer Care	01	795676-03
	Preferred Accounts/Corporate Customer Care		0660-8056
	Home/Small Business Technical Support	01	795676-04
	Preferred Accounts/Corporate Technical Support		0660-8779
	Web site: **http://support.euro.dell.com**		
	E-mail: tech_support_central_europe@dell.com		
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		
Czech Republic (Prague)	Technical Support	02	22 83 27 27
	Customer Care	02	22 83 27 11
	Fax	02	22 83 27 14
	TechFax	02	22 83 27 28
	Switchboard	02	22 83 27 11
	Web site: **http://support.euro.dell.com**		
	E-mail: czech_dell@dell.com		
Denmark (Horsholm) *NOTE: Customers in Denmark call Sweden for fax technical support.*	Technical Support		45170182
	Relational Customer Care		45170184
	Home/Small Business Customer Care		32875505
	Switchboard		45170100
	Fax Technical Support (Upplands Vasby, Sweden)	46	859005594
	Fax Switchboard		45170117
	Web site: **http://support.euro.dell.com**		
	E-mail: den_support@dell.com E-mail Support for Servers: Nordic_server_support@dell.com		
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

	Fax	01	55 94 71 01
	Switchboard	0825	004 700
	Switchboard (Alternative)	04	99 75 40 00
	Sales	0825	004 700
	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
	Fax	01	55 94 71 99
	Switchboard	01	55 94 71 00
	Sales	01	55 94 71 00
	Web site: **http://support.euro.dell.com**		
	E-mail: web_fr_tech@dell.com		
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
	Web site: **http://support.euro.dell.com**		
	E-mail: tech_support_central_europe@dell.com		
Ireland (Cherrywood)	Technical Support		0870 908 0800
	Home User Customer Care	01	204 4095
	Small Business Customer Care	01	204 4026
	Corporate Customer Care	01	204 4003
	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		
Italy (Milan)	**Home and Small Business**		
	Technical Support	02	577 826 90
	Customer Care	02	696 821 14
	Fax	02	696 821 13
	Switchboard	02	696 821 11
	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		

Luxembourg *NOTE: Customers in Luxembourg call Belgium for sales, customer, and technical assistance.*	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
	Switchboard (Brussels, Belgium)	02	481 91 00
	Fax (Brussels, Belgium)	02	481 92 99
	Web site: **http://support.euro.dell.com**		
	E-mail: tech_be@dell.com		
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
	Web site: **http://support.euro.dell.com**		
	E-mail: tech_nl@dell.com		
Norway (Lysaker) *NOTE: Customers in Norway call Sweden for fax technical support.*	Technical Support		671 16882
	Relational Customer Care		671 17514
	Home/Small Business Customer Care		231 62298
	Switchboard		671 16800
	Fax Technical Support (Upplands Vasby, Sweden)	00	08 590 05 594
	Fax Switchboard		671 16865
	Web site: **http://support.euro.dell.com**		
	E-mail: nor_support@dell.com E-mail Support for Servers: Nordic_server_support@dell.com		
Poland (Warsaw)	Technical Support	22	57 95 700
	Customer Care	22	57 95 999
	Sales	22	57 95 999
	Switchboard	22	57 95 999
	Fax	22	57 95 998
	Web site: **http://support.euro.dell.com**		
	E-mail: pl_support@dell.com		
Portugal	Technical Support	35	800 834 077
	Customer Care		800 300 415 or 800 834 075
	Sales		800 300 410 or 800 300 411 or 800 300 412
	Switchboard	34	917 229 200
	Fax	35	121 424 01 12
	E-mail es_support@dell.com		
Spain (Madrid)	**Home and Small Business**		
	Technical Support		902 100 130
	Customer Care		902 118 540
	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 E-mail Support for Latitude™ and Inspiron™: Swe-nbk_kats@dell.com E-mail Support for OptiPlex™ : Swe_kats@dell.com E-mail Support for Servers: Nordic_server_support@dell.com		
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 Service (Corporate)		0848 821 721
	Switchboard	022	799 01 01
	Fax	022	799 01 90
	Web site: **http://support.euro.dell.com**		
	E-mail: swisstech@dell.com		
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	0870	908 0500
	Preferred Accounts (500-5000 employees) Customer Care	01344	723 196
	Central Government Customer Care	01344	723 193
	Local Government Customer Care	01344	723 194
	Home/Small Business Sales	0870	907 4000
	Home/Small Business Customer Care	0870	906 0010
	Corporate/Public Sector Sales	01344	860 456
	Web site: **http://support.euro.dell.com**		
	E-mail: dell_direct_support@dell.com		

Asia and Other Regions Contact Numbers

			Local Number or

Country (City)	Department Name or Service	Area Code	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
Brunei *NOTE: Customers in Brunei call Malaysia for customer assistance.*	Customer Technical Support (Penang, Malaysia)		633 4966
	Customer Service (Penang, Malaysia)		633 4949
	Transaction Sales (Penang, Malaysia)		633 4955
China (Xiamen)	Technical Support		toll free: 800 858 2437
	Customer Experience		toll free: 800 858 2060
	Home and Small Business		toll free: 800 858 2222
	Preferred Accounts Division		toll free: 800 858 2062
	Large Corporate Accounts		toll free: 800 858 2999
Hong Kong *NOTE: Customers in Hong Kong call Malaysia for customer assistance.*	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
Japan (Kawasaki)	Technical Support (Server)		toll free: 0120-1984-35
	Technical Support (Dimension™ and Inspiron) Technical Support Outside of Japan (Dimension and Inspiron)	 81-44	toll free: 0120-1982-26 520-1435
	Technical Support (Dell Precision™, OptiPlex, and Latitude) Technical Support Outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44	toll free: 0120-1984-33 556-3894
	Customer Care	044	556-4240
	24-Hour Automated Order Status Service	044	556-3801
	Home and Small Business Group Sales	044	556-3344
	Individual User Sales	044	556-1760
	Business Sales Division (up to 400 employees)	044	556-1465
	Government, Educational, and Medical Sales	044	556-3345
	Preferred Accounts Division Sales (over 400 employees)	044	556-3433
	Dell Global Japan	044	556-3469
	Large Corporate Accounts Sales (over 3500 employees)	044	556-3430
	Faxbox Service	044	556-3490
	Switchboard	044	556-4300
	Web site: **http://support.jp.dell.com**		
Korea (Seoul)	Technical Support		toll free: 080-200-3800
	Sales		toll free: 080-200-3777
	Customer Service (Penang, Malaysia)		604-633-4949
	Customer Service (Seoul, Korea)		2194-6220

	Fax		2194-6202
	Switchboard		2194-6000
Macau *NOTE: Customers in Macau call Malaysia for customer assistance.*	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
New Zealand	Home and Small Business		0800 446 255
	Government and Business		0800 444 617
	Sales		0800 441 567
	Fax		0800 441 566
Singapore (Singapore) *NOTE: Customers in Singapore call Malaysia for customer assistance.*	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		
Southeast Asian/Pacific Countries (excluding Australia, Brunei, China, Hong Kong, Japan, Korea, Macau, Malaysia, New Zealand, Singapore, Taiwan, and Thailand—refer to individual listings for these countries)	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)		60 4 633-4810
Taiwan	Technical Support		toll free: 0080 60 1225
	Technical Support (Servers)		toll free: 0080 60 1256
	Customer Service (Penang, Malaysia)		633 4949
	Transaction Sales		toll free: 0080 651 228/0800 33 556
	Corporate Sales		toll free: 0080 651 227/0800 33 555
Thailand *NOTE: Customers in Thailand call Malaysia for customer assistance.*	Technical Support		toll free: 088 006 007
	Customer Service (Penang, Malaysia)		633 4949
	Sales		toll free: 088 006 009

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Diagnostics: Dell Precision™ WorkStation 620 System User's Guide

- Overview
- Features
- Before You Start Testing
- Starting the Dell Diagnostics
- Advanced Testing

Overview

If you experience a problem with your computer, run the Dell Diagnostics before you call Dell for technical assistance. The diagnostics tests check your computer's hardware without additional equipment and without the risk of destroying data. When the diagnostics tests complete without indicating problems, you can have confidence in your computer's operation. If the tests indicate a problem you cannot solve, the test error messages provide important information you need when talking to Dell's service and support personnel.

NOTICE: Only use the Dell Diagnostics to test your Dell computer system. Using this program with other computers may cause incorrect computer responses or result in error messages.

Features

The diagnostic test group features allow you to take the following actions:

- Perform quick checks or extensive tests on one or all devices
- Choose the number of times a test group or subtest is repeated
- Display or print test results or save them in a file
- Suspend testing if an error is detected or terminate testing when an adjustable error limit is reached
- Access online Help screens that describe the tests and tell how to run them
- Read status messages that inform you whether test groups or subtests completed successfully
- Receive error messages that appear if problems are detected

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Before You Start Testing

- Read "Safety First—For You and Your Computer" and the safety instructions in your *System Information Guide*.
- Turn on your printer if one is attached, and make sure it is online.
- Enter system setup, confirm your computer's system configuration information, and enable all of its components and devices, such as ports.
- Perform the checks in "Basic Checks."

Starting the Dell Diagnostics

NOTE: Dell recommends that you print these procedures before you begin. For additional information, refer to the Dell Precision WorkStations ResourceCD User's Guide located on the Dell ResourceCD.

1. Insert the Dell *ResourceCD* into the CD-ROM drive and restart the computer.

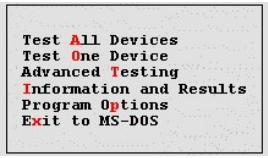
   *NOTES: If your system does not boot from the CD-ROM drive, enter **System Setup** and change the **Boot Sequence**.*

   *If you are starting the ResourceCD for the first time on this computer, the **ResourceCD Installation** window opens to inform you that the ResourceCD is about to begin installation. Click **OK** to continue. To complete the installation, respond to the prompts offered by the installation program. If the **Welcome Dell System Owner** screen opens, click **Next** to continue.*

2. Select the number for the language that you want.

   A numbered list of eight options appears.

3. Select **Option 2 – Dell Diagnostics** by typing 2 and pressing <Enter>. After the diagnostics load, the following **Diagnostics Main Menu** screen appears:



4. Select an option from the **Diagnostics Main Menu** screen by pressing the up- or down-arrow key to highlight the option and pressing <Enter>, or press the key that corresponds to the highlighted letter in the option title.

   - **Test All Devices** — Performs quick or extensive tests on all devices.
   - **Test One Device** — Performs quick or extensive tests on a single device after you select it from a list of device groups. After you select **Test One Device**, press <F1> for more information about a test.
   - **Advanced Testing** — Allows you to modify the parameters of a test, select a group of tests to perform, and access additional information about **Advanced Testing.**
   - **Information and Results** — Provides test results, test errors, version numbers of subtests, and additional information on the Dell Diagnostics.
   - **Program Options** — Allows you to change the settings of the Dell Diagnostics.
   - **Exit to MS-DOS** — Exits to the MS-DOS® prompt.

5. Select **Quick Tests** from the **Test All Devices** or **Test One Device** option to perform a quick check of your computer or a specific device.

   Quick Tests runs only the subtests that run fast and do not require user interaction. Dell recommends that you select **Quick Tests** first to increase your chance of locating the problem quickly.

6. Select **Extended Tests** from the **Test All Devices** or **Test One Device** option for a thorough check of your computer or to check a particular area of your computer.

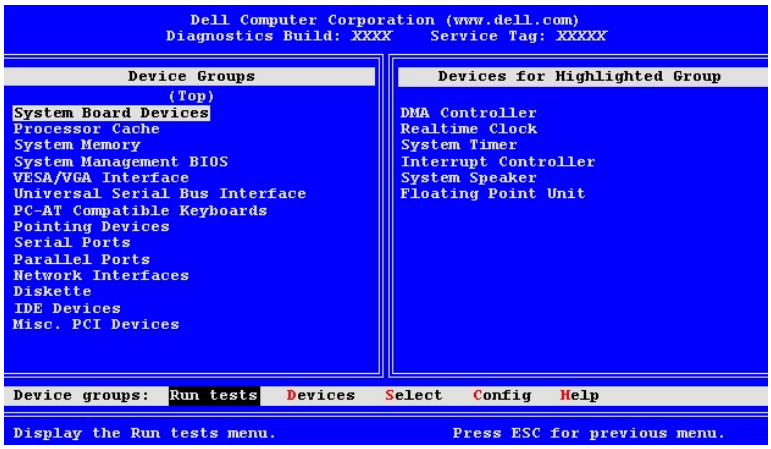
7. Select the **Advanced Testing** option to customize your test(s).

8. Remove the *ResourceCD* from the CD-ROM drive when you have finished running the Dell Diagnostics.

NOTE: To change the boot sequence, repeat step 1, set the boot sequence to fit your needs, and restart your computer.

Advanced Testing

When you select **Advanced Testing** from the **Diagnostics Main Menu** screen, the following advanced testing screen appears.



Information in the **Advanced Testing** screen is presented as follows:

- **Device Groups** — Lists the diagnostic test groups in the order they run if you select **All** from the **Run tests** menu option

  To select a test device group, press the up- or down-arrow key to highlight the group.

*NOTE: The diagnostics may not list in the **Device Groups** area the names of all components or devices that are part of your computer system. For example, it may not list a printer even though it is connected to your computer. However, the parallel port to which the printer is connected appears in the **Device Groups** list. You can test your printer connection in the **Parallel Ports** tests.*

- **Devices for Highlighted Group —** Lists the computer's current hardware
- **Device groups:** menu bar — Contains the options **Run tests**, **Devices**, **Select**, **Config**, and **Help**

  To select a menu option, press the left- or right-arrow key to highlight the option and press <Enter>, or press the key that corresponds to the highlighted letter in the category title.

For more information on using the **Advanced Testing** screen, select the **Help** menu option.

NOTE: The options displayed on your screen should reflect the hardware configuration of your computer.

Advanced Testing Help Menu

The **Help** options and a description of their functions are presented in the following table.

Help Option	Description
Menu	Describes the **Advanced Testing** screen, the **Device Groups**, and the diagnostic menus and commands and gives instructions on how to use them
Keys	Explains the functions of all keystrokes that can be used in the Dell Diagnostics
Device Group	Describes the highlighted group in the **Device Groups** list on the main menu and provides reasons for using certain tests
Device	Describes the highlighted device in the **Device Groups** list on the **Advanced Testing** screen
Test	Describes the test procedure for each highlighted test group subtest
Versions	Lists the version numbers of the subtests

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Installing Drives: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- Removing and Replacing the Front Bezel
- Removing and Replacing Front-Panel Inserts
- Connecting Drives
- Installing a Drive in a 5.25-Inch Drive Bay
- Installing an EIDE Hard-Disk Drive
- Installing SCSI Devices

Overview

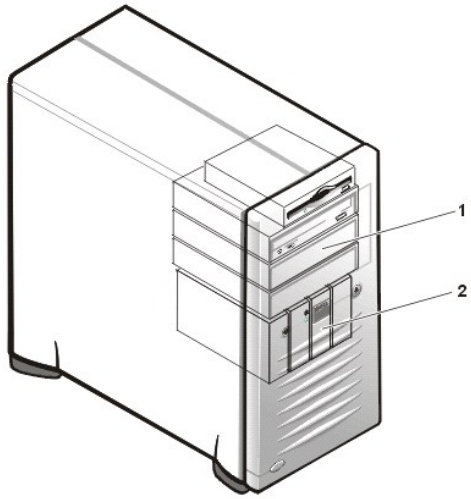
Your Dell™ computer has eight drive bays in the mini tower chassis for installing the following types of drives (see Figure 1):

- The externally accessible drive bays at the front of the computer consist of one 3.5-inch drive bay (dedicated to a 3.5-inch diskette drive) and three 5.25-inch bays that can hold up to three half-height, 5.25-inch devices—typically tape drives or CD-ROM drives. Alternately, 3.5-inch devices can be installed in the 5.25-inch bays using adapters available from Dell.
- The four-bay hard-disk drive cage below the externally accessible bays can hold up to four 1-inch, up to three 1.6 inch, or up to two 1-inch and two 1.6-inch hard-disk drives installed vertically. The drives must be either enhanced integrated drive electronics (EIDE) hard-disk drives or small computer system interface (SCSI) hard-disk drives.

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

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

Figure 1. Drive Locations



1 External drive bays
2 Four-bay hard-disk drive cage (internal)

Removing and Replacing the Front Bezel

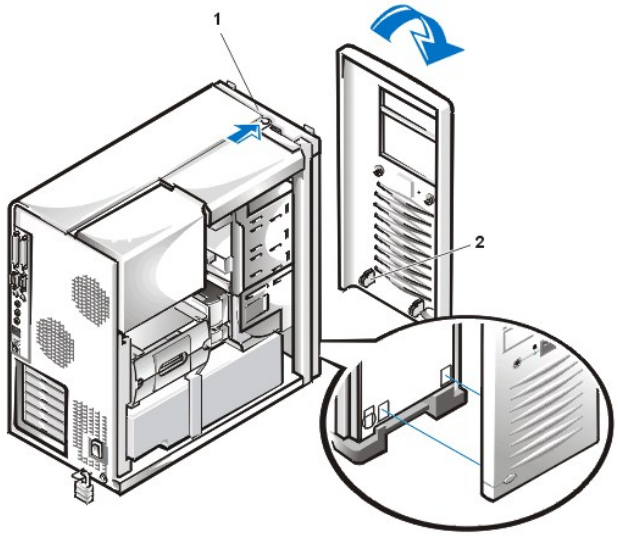
The bezel is secured to the front of the chassis by two tabs and two hooks (see Figure 2). To remove the bezel, perform the following steps:

1. Remove the computer cover.

NOTICE: Before the front bezel can be removed, you must remove the computer cover and press the green tab release.

2. While pressing the green tab release, tilt the bezel away from the chassis, disengage the two retaining hooks at the bottom of the bezel, and carefully pull the bezel away from the chassis.

Figure 2. Removing the Front Bezel



1 Tab release

2 Retaining hooks (2)

To replace the bezel, perform the following steps:

1. Fit the two retaining hooks on the bezel into their corresponding slots at the bottom of the chassis.
2. Rotate the top of the bezel toward the chassis until the top tabs snap into their corresponding slots on the bezel.
3. Replace the computer cover.

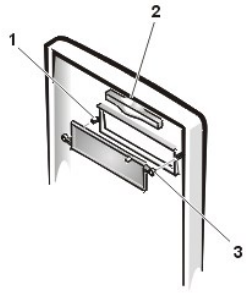
Removing and Replacing Front-Panel Inserts

Empty drive bays contain a front-panel insert to protect the inside of the computer from dust particles and also to ensure proper airflow within the computer. Before you install a drive in an empty drive bay, you must first remove the front-panel insert.

To remove the insert covering a 5.25-inch bay, perform the following steps:

1. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from their electrical outlets.
2. Remove the computer cover.
3. Remove the front bezel.
4. With your thumbs, press in on each end of the insert until the insert snaps free of the bezel on the chassis (see Figure 3).

Figure 3. Removing the Front-Panel Insert for a 5.25-Inch Bay



1 Posts (2)

2 Bezel

3 Ring tabs (2)

To replace a front-panel insert for a 5.25-inch bay, perform the following steps:

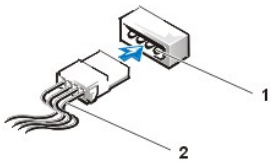
1. Working from inside the bezel, insert the two ring-tabs (one on each end of the insert) over the posts on the inside of the bay opening.
2. Firmly press both ends of the insert into place (see Figure 3).

3. Replace the front bezel.
4. Replace the computer cover.

Connecting Drives

When installing a drive, you connect two cables—a DC power cable and an interface cable—to the back of the drive. Your drive's power input connector (to which you connect the DC power cable) resembles the connector shown in Figure 4.

Figure 4. DC Power Cable Connector

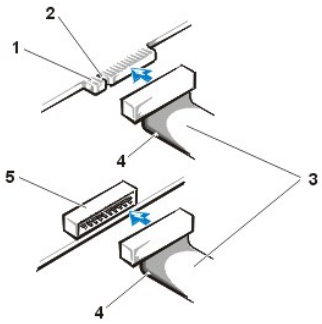


1 Power input connector

2 DC power cable

The drive's interface connector is a card-edge connector or a header connector, as shown in Figure 5.

Figure 5. Drive Interface Connectors



1 System board connector

2 Keyed notch

3 Interface cable

4 Colored strip

5 Drive interface connector

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

When disconnecting an interface cable from the system board, pull firmly on the cable connector, not on the cable. When attaching an interface cable to the system board, ensure that the cable is firmly attached to the connector on the system board.

Most interface connectors are keyed for correct insertion; that is, a notch or a missing pin on one connector matches a tab or a filled-in hole on the other connector (see Figure 5). Keying ensures that the pin-1 wire in the cable (indicated by the colored strip along one edge of the cable) goes to the pin-1 end of the connector.

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

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

Installing a Drive in a 5.25-Inch Drive Bay

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

- A CD-ROM, LS-120 SuperDisk, or tape drive that uses the secondary EIDE interface or the secondary SCSI interface on the system board

  NOTES: LS-120 SuperDisk drives are EIDE devices.

  Dell Precision WorkStation 620 systems equipped with LS-120 SuperDisk drives have the drive configured as the master device on the secondary EIDE channel. If you install an LS-120 SuperDisk drive in your system, Dell recommends that you configure the drive for this setting. For instructions on configuring the drive as the master device, see the documentation that accompanied the drive.

- Any 5.25-inch device that uses its own controller card

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

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

1. Unpack the drive and prepare it for installation.

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

Check the documentation that accompanied the drive to verify that the drive is configured for your computer system. Change any settings necessary for your configuration.

If you are installing an EIDE CD-ROM, LS-120 SuperDisk, or tape drive, configure the drive for the **Cable Select** setting.

If you are installing a SCSI device, make sure the device has termination disabled. See "Installing SCSI Devices."

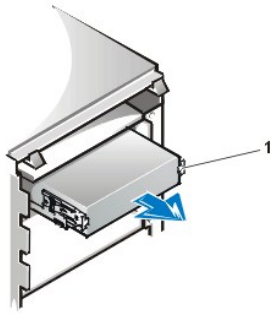
2. Remove the computer cover.

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

3. Remove the front bezel.
4. Remove the drive bracket from the bay you want to use.

Squeeze the metal tabs that extend from each side of the drive bracket toward each other, and pull the bracket out of the bay (see Figure 6).

Figure 6. Removing a Drive



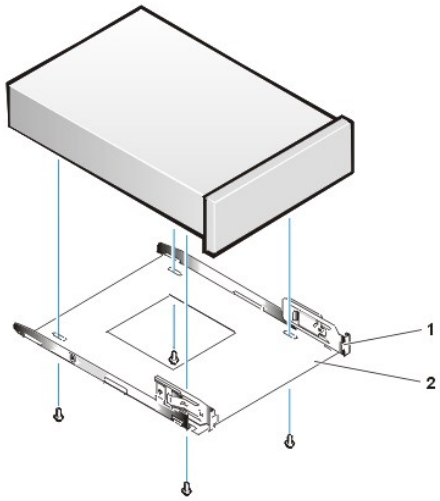
1 Bracket tabs (2)

If a drive is already installed in the bay and you are replacing it, be sure to disconnect the DC power cable and interface cable from the back of the drive before sliding the bracket out of the bay. To remove the old drive from the bracket, unscrew the four screws that secure the drive to the bracket (see Figure 7).

5. Attach the bracket to the new drive.

Locate the four screw holes around the drive's perimeter. Fit the bracket over the drive, and then tilt the front of the drive up so that the bracket drops down into place. To ensure proper installation, all screw holes should be aligned and the tabs on the front of the bracket should be flush with the front of the drive (see Figure 7).

Figure 7. Attaching the Drive Bracket to the New Drive



1 Bracket tabs (2)

2 Bracket

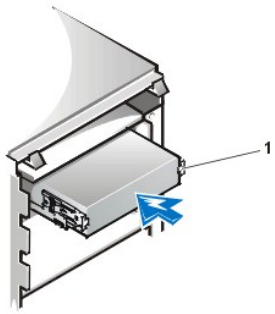
To further ensure proper positioning of the drive in the chassis, insert and tighten all four screws *in the order in which the holes are numbered* (the holes are marked "1" through "4").

NOTE: The 5.25-inch drive bracket only supports bottom mounted drives. No screw holes are available on the sides of the bracket.

6. Slide the new drive into the drive bay until it snaps securely into place (see Figure 8).

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

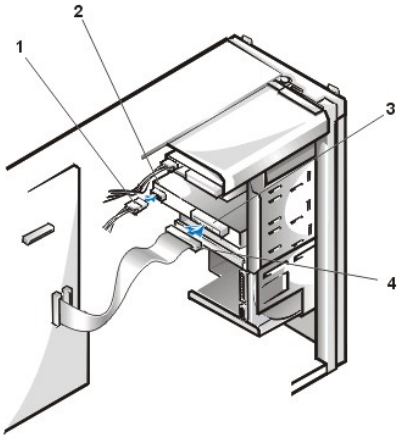
Figure 8. Inserting the New Drive Into the Drive Bay



1 Bracket tabs (2)

7. If you are installing a drive that has its own controller card, install the controller card in an expansion slot (see "Installing an Expansion Card.").
8. Connect a DC power cable to the power input connector on the back of the drive (see Figure 9).

Figure 9. Attaching EIDE Tape Drive Cables



1 DC power cable

2 Power input connector

3 Interface connector

4 EIDE cable for tape drive

9. Connect the appropriate interface cable to the interface connector on the back of the drive (see Figure 9).

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

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

10. For an EIDE tape drive, LS-120 SuperDisk drive, or CD-ROM drive, connect the other end of the interface cable to the interface connector labeled "IDE2" on the system board (see Figure 1 in "Installing System Board Options").

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

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

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

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

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

13. Replace the front bezel.

14. Replace the computer cover.

15. Reconnect your computer and peripherals to their power sources, and turn them on.

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

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

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

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

17. Update your system configuration information.

    For a diskette drive, update the appropriate **Diskette Drive** category (**A** or **B**) on Page 1 of the System Setup screens to reflect the size and capacity of your new diskette drive.

    For EIDE CD-ROM and tape drives, set the appropriate **Drive** category (**0** or **1**) under **Drives: Secondary** to **Auto**.

18. Verify that your system works correctly by running the Dell Diagnostics.

    See your *Diagnostics and Troubleshooting Guide* for information on running the Dell Diagnostics and troubleshooting any problems that may occur. Use the following guidelines to determine which test to use:

- *If you installed a diskette drive*, test it by running all of the subtests in the **Diskette Drives** test group of the Dell Diagnostics.
- *If you installed a CD-ROM drive*, see the documentation that came with the drive for instructions on loading device drivers and using the

drive. If it is an EIDE CD-ROM drive, test it by running all of the subtests in the **EIDE CD-ROM Drives** test group of the Dell Diagnostics.

- *If you installed a tape drive*, perform a tape backup and verification test with the drive as instructed in the documentation that came with the tape drive.

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

Installing an EIDE Hard-Disk Drive

NOTE: Although Dell Precision WorkStation 620 computer systems normally use only SCSI devices, they also support EIDE devices. Your system does not support a mix of SCSI and EIDE devices.

This section includes information on installing, partitioning, and formatting EIDE hard-disk drives. For instructions on installing, partitioning, and formatting SCSI hard-disk drives, see "Installing SCSI Devices."

Up to four 1-inch or up to two 1-inch and two 1.6-inch EIDE drives can be installed in the internal hard-disk drive cage below the externally accessible 5.25-inch drive bays.

EIDE Drive Addressing

All EIDE devices should be configured for the cable select jumper position, which assigns master and slave status to devices by their position on the EIDE cable. When two EIDE devices are connected to a single EIDE cable and are configured for the cable select jumper position, the device attached to the last connector on the interface cable is the master or boot device (drive 0) and the device attached to the middle connector on the interface cable is the slave device (drive 1). Refer to the drive documentation in your upgrade kit for information on setting devices to the cable select jumper position.

With the two EIDE interface connectors on the system board, your system can support up to four EIDE devices. EIDE hard-disk drives should be connected to the EIDE interface connector labeled "IDE1." (EIDE tape drives, LS-120 SuperDisk drives, and CD-ROM drives should be connected to the EIDE interface connector labeled "IDE2.")

Installing an EIDE Hard-Disk Drive in the Hard-Disk Drive Bracket

1. If you are replacing a hard-disk drive that contains data you want to keep, backup your files before you continue with this procedure.
2. Prepare the drive for installation.

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

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

   Check the documentation that came with the drive to verify that it is correctly configured for your system.

3. Remove the computer cover.

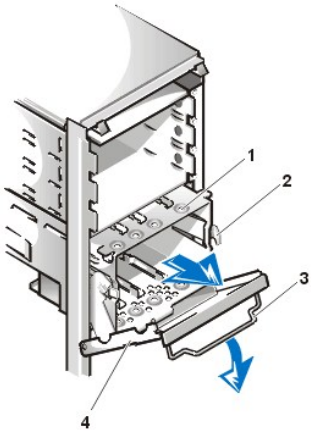
NOTICE: See "Safety First—For You and Your Computer."

4. Remove the front bezel.
5. Open the drive cage door.

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

   Grasp the handle of the drive cage door on the front of the chassis, and pull out and down until the arms on the drive cage door disengage from the tabs on the bracket (see Figure 10). This action pulls the bracket out of the drive cage about 1 to 3 inches.

Figure 10. Removing the Hard-Disk Drive Bracket



1 Hard-disk drive bracket

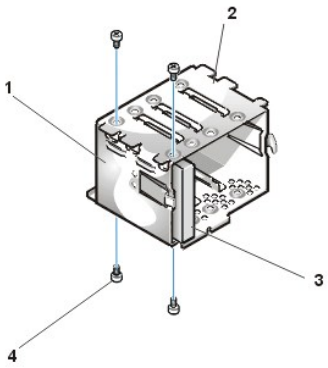
2 Hinge tabs

3 Drive door handle

4 Drive door

6. Remove the bracket from the drive cage.
7. Slide the drive into the chosen bay of the bracket, orienting it so that the connectors on the back of the drive face the inside of the chassis when the bracket is reinstalled (see Figure 11).
8. Align the four screw holes of the drive and bracket.
9. Insert and tighten the four screws that came with your upgrade kit in the top and bottom of the bracket (see Figure 11) to secure the installed hard-disk drive(s).

Figure 11. Inserting a 1-Inch Hard-Disk Drive Into the Bracket



1 Drive bracket

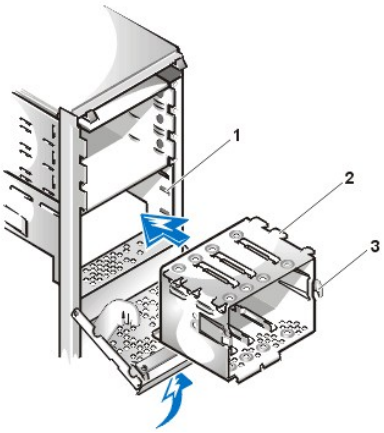
2 Hooks (3)

3 1-inch drive (back)

4 Screws (4)

10. Insert the bracket into the drive cage by sliding it in until the tabs snap into place (see Figure 12). Rotate the drive cage door up and toward the chassis until it snaps securely into place. Be sure to fold down the drive-cage door handle so that the bezel can be replaced on the chassis.

Figure 12. Inserting the Hard-Disk Drive Bracket Into the Chassis



1 Drive cage

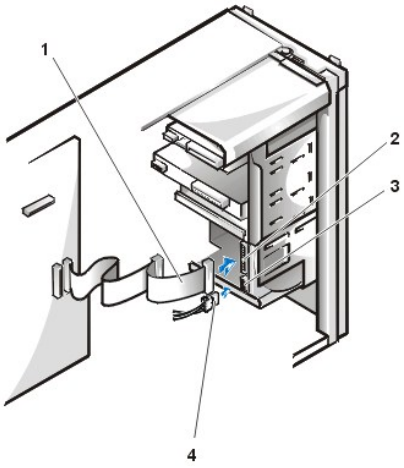
2 Drive bracket

3 Hinge tabs

11. Connect a DC power cable to the power input connector on the back of the drive (see Figure 13).
12. Check all connectors to be certain that they are properly cabled and firmly seated.
13. Connect one of the device connectors on the EIDE cable to the 40-pin interface connector on the back of the hard-disk drive (see Figure 13).

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

Figure 13. Attaching Hard-Disk Drive Cables



1 EIDE interface cable
2 EIDE interface connector
3 DC power input connector
4 DC power cable

14. If the other end of the EIDE cable is not already connected, connect it to the IDE1 connector on the system board.

NOTICE: You must match the colored strip on the EIDE cable with pin 1 on the IDE1 connector to avoid possible damage to your system.

To locate the IDE1 connector, see Figure 1 in "Installing System Board Options."

15. Replace the front bezel.
16. Replace the computer cover.
17. Reconnect your computer and peripherals to their power sources, and turn them on.

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

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

18. Insert a bootable diskette (such as the *Dell Diagnostics Diskette*) into drive A.
19. Enter System Setup, and update the appropriate **Drive** category (**0** or **1**) under **Primary Drive n and Secondary Drive n**.

See "Primary Drive *n* and Secondary Drive *n*."

20. While in System Setup, reset the chassis intrusion detector by selecting **System Security**, and change **Chassis Intrusion** to **Enabled, Enabled Silent**, or **Disabled**.

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

21. After you update the System Setup settings, reboot the system.
22. Partition and logically format your EIDE hard-disk drive using the program(s) offered by your operating system.

NOTES: EIDE hard-disk drives must be physically formatted, partitioned, and logically formatted before they can be used to store data. Every hard-disk drive from Dell is physically formatted before it is sent to you.

In the Microsoft® Windows NT® operating system with the file allocation table (FAT) 16 file system, the primary partition for

each hard-disk drive can be no larger than 2 gigabytes (GB). Extended partitions can be larger than 2 GB, but each logical drive within an extended partition must be no larger than 2 GB.

23. Test the hard-disk drive by running the **Hard-Disk Drives (Non-SCSI)** test group in the Dell Diagnostics.

    See your *Diagnostics and Troubleshooting Guide* for information on running the diagnostics and troubleshooting any problems that may occur.

24. Install your operating system on the hard-disk drive.

    See the documentation that came with your operating system.

Installing SCSI Devices

NOTE: Although Dell Precision WorkStation 620 computer systems normally use only SCSI devices, they also support EIDE devices. Your system does not support a mix of SCSI and EIDE devices.

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

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

SCSI ID Numbers

Internal SCSI devices attached to the integrated Adaptec 7899 Ultra160/M 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.

Externally accessible SCSI devices attached to the integrated Adaptec 7899 Ultra160/M controller through the 50-pin Narrow SCSI connector on the system board must have a unique SCSI ID number from 0 to 7.

External SCSI devices connected to the integrated Adaptec 7899 Ultra160/M controller through the 68-pin Ultra/Wide SCSI connector on the system back panel must have a unique SCSI ID number from 0 to 15. This SCSI ID number cannot conflict with any SCSI ID number already assigned to a SCSI device connected to the 50-pin internal SCSI connector on the system board.

Dell assigns default SCSI ID numbers to the primary and secondary controllers as follows:

- Primary SCSI controller:
  - The primary 7899 Ultra160/M LVD SCSI controller is configured through the computer's basic input/output system (BIOS) as SCSI ID 7.
  - The first internal SCSI hard-disk drive is configured as SCSI ID 0. (The drive used to boot your system should always be configured as SCSI ID 0.)
- Secondary SCSI controller:
  - The secondary 7899 Ultra160/M SCSI controller is configured through the computer's BIOS as SCSI ID 7.
  - A SCSI CD-ROM drive is configured as SCSI ID 5.
  - A SCSI tape drive or digital audio tape (DAT) drive (if installed) is configured as SCSI ID 6.

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

See "System Features" for performance limitations of the secondary controller.

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

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 to the 7899 Ultra160/M 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 two SCSI hard-disk drives in the internal drive bays (see Figure 14).

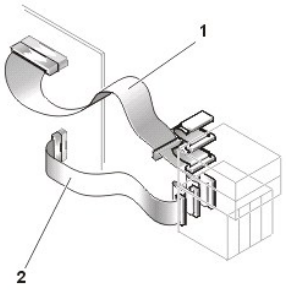
The 50-pin (internal) Narrow SCSI cable connects SCSI devices to the 7899 Ultra160/M controller.

- The narrow connector at the end of the cable attaches to the secondary SCSI controller connector labeled "SCSI_NARROW" on the system board.
- The other connectors on the cable are used for attaching SCSI devices installed in the externally accessible drive bays (see Figure 14).

An optional shielded external cable with a 68-pin connector is used for attaching an external SCSI device to the 7899 Ultra160/M external SCSI connector on the system's back panel.

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

Figure 14. Internal SCSI Cable



1 50-pin SCSI cable (to device[s] in externally accessible drive bay)

2 68-pin SCSI cable (to hard-disk drive)

SCSI Device Installation

To install a SCSI device, perform the following steps:

1. Determine which connector on the internal SCSI cable you will attach to each SCSI device (see "Installing SCSI Devices").
2. Unpack the SCSI device and prepare it for installation.

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

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

3. Configure the device for a SCSI ID number and disable termination, if necessary. For instructions, see the documentation that came with the SCSI device as well as "Installing SCSI Devices."
4. Install the SCSI device as appropriate.
   - *To install a SCSI hard-disk drive*, complete steps 3 through 10 of "Installing an EIDE Hard-Disk Drive." Then continue with step 5 of *this* procedure.
   - *To install a SCSI tape drive, CD-ROM drive, or DAT drive*, complete steps 2 through 6 of "Installing a Drive in a 5.25-Inch Drive Bay." Then continue with step 5 of *this* procedure.
   - *To install an external SCSI device*, continue with step 5 of *this* procedure.
   - *To install a SCSI host adapter card*, configure the card and install it in an empty expansion slot (see "Installing an Expansion Card".) If you attach any SCSI hard-disk drives to the host adapter card, connect the hard-disk drive access cable to the SCSI host adapter card and to the AUX LED connector on the system board (see Figure 1 in "Installing System Board Options"). Then continue with step 5 of *this* procedure.
5. Attach the SCSI cable to each SCSI device.

For additional instructions on connecting SCSI devices, see "SCSI Cables."

- *If you are installing an internal SCSI device*, firmly press the SCSI cable's header connector onto the 50- or 68-pin connector on the back of the device.

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

  The connectors on Narrow SCSI cables are keyed for proper positioning-a raised area on the outside of the header connector fits into a notch on the device connector. The connectors on Wide SCSI cables are shaped so that they can be attached one way only.

- *If you are installing an external SCSI device*, connect one end of the external SCSI cable to the SCSI bus connector on the back of the device. Attach the other end of the external SCSI cable to the SCSI connector on the system back panel.

6. Connect the SCSI device(s) to a power source.

   - *If you are installing an internal SCSI device*, connect a DC power cable to the power input connector on the SCSI device.
   - *If you are installing an external SCSI device*, connect the socket end of the power cable into the AC power receptacle on the back of the SCSI device. Connect the other end of the power cable into a standard electrical wall outlet.

7. Check all other cable connections. Fold all internal cables out of the way to provide airflow for the fan or cooling vents.
8. If you installed an externally accessible device, remove the front-panel insert for the drive bay.
9. Replace the front bezel.
10. Replace the computer cover.
11. Reconnect your computer and peripherals to their power sources, and turn them on.

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

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

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

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

13. If necessary, update the drive system configuration information in the System Setup program.

    For any SCSI devices, the respective category under **Drives: Primary** or **Drives: Secondary** should be set to **None**.

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

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

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

15. Test the SCSI devices.

    - To test a SCSI hard-disk drive, run the SCSI diagnostics. See your *Diagnostics and Troubleshooting Guide* for information on running the Dell Diagnostics and troubleshooting any problems that may occur.
    - To test a SCSI tape drive, see the tape drive documentation to perform a tape drive backup and verification test.

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- Troubleshooting the Monitor
- Troubleshooting the Keyboard
- Troubleshooting the Mouse
- Troubleshooting I/O Ports
- Troubleshooting Basic I/O Functions
- Troubleshooting a Parallel Printer
- Troubleshooting a Serial I/O Device

Overview

This section provides troubleshooting procedures for equipment that connects directly to the input/output (I/O) panel of your computer, such as your monitor, keyboard, mouse, or printer. Before performing any of the procedures in this section, see "Checking Connections and Switches." Then perform the troubleshooting procedures for the equipment that is malfunctioning.

You need to run the Dell Diagnostics located on the *Dell Precision ResourceCD* to perform the procedures in this section.

Troubleshooting the Monitor

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

- Monitor or monitor interface cable
- Video controller

The procedures in this section troubleshoot problems with the monitor and the monitor interface cable only.

If information on the monitor screen is displayed incorrectly or not at all, perform the following steps in order until the problem is resolved:

1. Turn on the system, including any attached peripherals.
2. Adjust the switches and controls as specified in the monitor's documentation to correct the video image, including the horizontal and vertical position and size.
3. Insert the *Dell Precision ResourceCD* into the CD-ROM drive, reboot the system, and run the **Video** test group in the Dell Diagnostics.
4. Turn off the system and disconnect it from the electrical outlet. Swap the monitor with one of the same type that is working, and reconnect the system to an electrical outlet.
5. Reboot the system, and run the **Video** test group again.

   If the tests complete successfully, the original monitor was faulty. If the tests still fail, the video controller on the system board may be faulty. See "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting the Keyboard

This procedure determines what kind of keyboard problem you have. If a system error message indicates a keyboard problem when you start the computer system or if the keyboard does not operate as expected, perform the following steps in order until the problem is resolved:

1. If the keyboard or its cable shows signs of physical damage or if the keys do not work, replace the keyboard with a working keyboard.
2. Insert the *Dell Precision ResourceCD* into the CD-ROM drive, reboot the system, and run the **Keyboard** test group in the Dell Diagnostics.
3. If the **Keyboard Interactive Test** fails, replace the keyboard.
4. If the **Keyboard Controller Test** fails, the system board may be faulty. See "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting the Mouse

This procedure determines what kind of mouse problem you have. If a system error message indicates a mouse problem when you start the computer system or if the mouse does not operate as expected, perform the following steps in order until the problem is resolved:

1. Clean the mouse as instructed in your mouse documentation.

   Most mice have a ball that can be removed and cleaned of debris by turning the mouse upside down and removing a cover on the bottom of the mouse. Also remove any lint or other debris that has accumulated on the bottom of the mouse.

2. If the mouse or its cable shows signs of physical damage or if the buttons do not work, replace the mouse with a working mouse.

3. Insert the *Dell Precision ResourceCD* into the CD-ROM drive, reboot the system, and run the **Mouse Test** in the Dell Diagnostics.

4. If the **Mouse Test** fails, the system board may be faulty. See "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting I/O Ports

This section provides a procedure for troubleshooting the ports on your computer's I/O panel and the equipment connected to them, such as printers, scanners, or other peripheral devices.

You can also use this procedure to test I/O ports on expansion cards. However, you should first make sure that the card is configured and installed correctly.

If a system error message indicates a port problem or if equipment connected to a port seems to perform incorrectly or fails, the source of the problem may be any of the following:

- A faulty connection between the I/O port and the peripheral device
- A faulty cable between the I/O port and the peripheral device
- A faulty peripheral device
- Incorrect settings in System Setup
- Incorrect settings in the system's configuration files
- Faulty I/O port logic on the system board

*NOTE: With certain modems installed, the **Serial Port** test group subtests may fail because the modem appears to the diagnostics as a serial port, but it cannot be tested as a serial port. If you have a modem installed and you experience a serial port test failure, remove the modem and run the diagnostic tests again.*

Troubleshooting Basic I/O Functions

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 in order until the problem is resolved:

1. Enter System Setup and verify that the settings for the **Serial Port 1**, **Serial Port 2**, and **Parallel Port** options are set to **Auto**.

2. Insert the *Dell Precision ResourceCD* into the CD-ROM drive, reboot the system, and run the **Serial/Infrared Ports** test group and/or the **Parallel Ports** test group in the Dell Diagnostics.

If any of the tests fail, the system board may be faulty. See "Getting Help" for instructions on obtaining technical assistance.

If the problem persists, go to "Troubleshooting a Parallel Printer" or "Troubleshooting a Serial I/O Device," depending on which device appears to be malfunctioning.

Troubleshooting a Parallel Printer

If the information in "Troubleshooting Basic I/O Functions" indicates that the problem is with a parallel printer, perform the following steps in the order indicated until the problem is resolved:

1. Reinstall the printer device driver.

   See the documentation for the printer and for your operating system for instructions on reinstalling the printer driver.

2. Turn off the parallel printer and computer, replace the parallel printer interface cable with a known working cable, and turn on the parallel printer and computer.

   If the problem is resolved, the original printer cable was faulty.

3. Run the parallel printer's self-test.

   If the test fails, the printer is faulty.

If the problem still is not resolved, the system board may be faulty. See "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting a Serial I/O Device

If the information in "Troubleshooting Basic I/O Functions" indicates that the problem is with a device connected to one of the serial ports, perform the following steps in order until the problem is resolved:

1. Attach the serial device to the other serial port (for example, if it is currently connected to serial port 1, attach the device to serial port 2).

   the problem is resolved, the serial port on the system board is faulty. See "Getting Help" for instructions on obtaining technical assistance.

2. If the faulty device has a detachable serial cable, replace the serial cable.

   If the problem is resolved, the serial cable was faulty.

3. Replace the faulty serial device.

If the problem is still not resolved, the system board may be faulty. See "Getting Help" for instructions on obtaining technical assistance.

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Glossary: Dell Precision™ WorkStation 620 Systems User's Guide

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A

A

ampere(s)

AC

alternating current

ACPI

Advanced Configuration and Power Interface. ACPI enables operating-system-directed power management rather than system BIOS-directed power management. In addition, it provides a generic system event mechanism for Plug and Play and an interface for configuration control.

adapter card

An expansion card that plugs into an expansion-card connector on the computer's system board. An adapter card adds some specialized function to the computer by providing an interface between the expansion bus and a peripheral device. Examples of adapter cards include network cards and sound cards.

ADI

Autodesk Device Interface

AGP

accelerated graphics port. AGP is a dedicated graphics port that provides a faster interface between the video subsystem and system memory than a PCI graphics device and allows conventional memory to be used for video-related tasks. The improved interface enables AGP to deliver a smooth, true-color video image.

application program

Software, such as a spreadsheet or word processor, designed to help you perform a specific task or series of tasks. Application programs run from the operating system.

ASCII

American Standard Code for Information Interchange. A text file containing only characters from the ASCII character set (usually created with a text editor, such as Notepad in Microsoft® Windows®) is called an ASCII file.

ASIC

application-specific integrated circuit

asset tag code

An individual code assigned to a computer, usually by a system administrator, for security or tracking purposes.

attribute

As it relates to DMI, an attribute is a piece of information related to a component. Attributes can be combined to form groups. If an attribute is defined as read-write, it may be defined by a management application.

***autoexec.bat** file*

The **autoexec.bat** file (Windows 98 and MS-DOS® only) is executed when you boot your computer (after executing any commands in the **config.sys** file). That start-up file contains commands that define the characteristics of each device connected to your computer, and it finds and executes programs stored in locations other than the active directory.

B

backup

A copy of a program or data file. As a precaution, you should back up your computer's hard-disk drive on a regular basis. Before making a change to the configuration of your computer, you should back up important start-up files from your operating system.

backup battery

The backup battery maintains the system configuration, date, and time information in a special section of memory when the system is turned off.

base memory

Synonym for conventional memory.

batch file

An ASCII text file containing a list of commands that run in sequence. Instead of typing each command, you need only type the batch filename. The system executes the commands as if you had typed each one individually. Batch files must have a filename extension of **bat**.

baud rate

A measurement of data transmission speed. For example, modems are designed to transmit data at one or more specified baud rate(s) through the COM (serial) port of a computer.

BBS

bulletin board service. A computer system that serves as a central location for accessing data or relaying messages by modem. For example, the Dell™ TechConnect BBS contains the latest version of software such as video drivers. If your system has a modem, you can access the BBS and download the most recent version of this software.

beep code

A diagnostic message in the form of a pattern of beeps from your computer's speaker. For example, one beep, followed by a second beep, and then a burst of three beeps is beep code 1-1-3.

binary

A base-2 numbering system that uses 0 and 1 to represent information. The computer performs operations based on the ordering and calculation of these numbers.

BIOS

basic input/output system. Your computer's BIOS contains programs stored on a flash memory chip. The BIOS controls the following:

- Communications between the microprocessor and peripheral devices, such as the keyboard and the video adapter
- Miscellaneous functions, such as system messages

bit

The smallest unit of information interpreted by your computer.

boot routine

When you start your computer, it clears all memory, initializes devices, and loads the operating system. Unless the operating system fails to respond, you can reboot (also called *warm boot*) your computer by pressing <Ctrl><Alt><Del>; otherwise, you must perform a cold boot by pressing the reset button or by turning the computer off and then back on.

bootable diskette

A diskette that can boot your computer to the operating system in the event that the computer will not boot from the hard-disk drive.

bpi

bits per inch

bps

bits per second

BTU

British thermal unit

bus

An information pathway between the components of a computer. Your computer contains an expansion bus that allows the microprocessor to communicate with controllers for all the various peripheral devices connected to the computer. Your computer also contains an address bus and a data bus for communications between the microprocessor and RAM.

byte

Eight contiguous bits of information; the basic data unit used by your computer.

C

C

Celsius

C-RIMM

continuity Rambus inline memory module. Rambus continuity modules are used to populate empty RIMM slots in some systems.

cache

To facilitate quicker data retrieval, a storage area for keeping a copy of data or instructions. For example, your computer's BIOS may cache ROM code in faster RAM. Or a disk-cache utility may reserve RAM in which to store frequently accessed information from your computer's disk drives; when a program makes a request to a disk drive for data that is in the cache, the disk-cache utility can retrieve the data from RAM faster than from the disk drive.

card-edge connector

On the bottom of an expansion card, the metal-contact section that plugs into an expansion-card connector.

CD-ROM

compact disc read-only memory. CD-ROM drives use optical technology to read data from compact discs. Compact discs are read-only storage devices; you cannot write new data to a compact disc with standard CD-ROM drives.

cm

centimeter(s)

CMOS

complementary metal-oxide semiconductor. In computers, CMOS memory chips are often used for NVRAM storage.

COMn

The device names for the first through fourth serial ports on your computer are COM1, COM2, COM3, and COM4. The default interrupt for COM1 and COM3 is IRQ4, and the default interrupt for COM2 and COM4 is IRQ3. Therefore, you must be careful when you configure software that runs a serial device so that you do not create an interrupt conflict.

component

As they relate to DMI, manageable components are operating systems, computer systems, expansion cards, or peripheral devices that are compatible with DMI. Each component is made up of groups and attributes that are defined as relevant to that component.

***config.sys** file*

The **config.sys** file (Windows 98 and MS-DOS only) is executed when you boot your computer (before running any commands in the **autoexec.bat** file). This start-up file contains commands that specify which devices to install and which drivers to use. This file also contains commands that determine how the operating system uses memory and controls files.

controller

A chip that controls the transfer of data between the microprocessor and memory or between the microprocessor and a peripheral device such as a disk drive or the keyboard.

control panel

The part of the computer that contains indicators and controls, such as the power switch, hard-disk drive access indicator, and power indicator.

conventional memory

The first 640 KB of RAM. Conventional memory is found in all computers. Unless they are specially designed, MS-DOS programs are limited to running in conventional memory.

coprocessor

A chip that relieves the computer's microprocessor of specific processing tasks. A math coprocessor, for example, handles numeric processing. A

graphics coprocessor handles video rendering. The Intel® Pentium® microprocessor, for example, includes an integrated math coprocessor.

cpi

characters per inch

CPU

central processing unit. See also microprocessor.

cursor

A marker, such as a block, an underscore, or a pointer, that represents the position at which the next keyboard or mouse action will occur.

D

DAT

digital audio tape

dB

decibel(s)

dBA

adjusted decibel(s)

DC

direct current

Dell Diagnostics

A comprehensive set of diagnostic tests for your Dell computer. To use the diagnostics, you must boot your computer from the *Dell Diagnostics Diskette*. See your *Diagnostics and Troubleshooting Guide* for more information about using the Dell Diagnostics.

Dell Inspector

A DMI browser that allows you to view your computer system's current hardware configuration and operating system version. If your system includes Dell-installed software, you can select this program from the **Dell Accessories** program folder.

device driver

A program that allows the operating system or some other program to interface correctly with a peripheral device, such as a printer. Most device drivers are installed when the operating system is installed.

DIN

Deutsche Industrie Norm

DIP

dual in-line package. A circuit board, such as a system board or expansion card, may contain DIP switches for configuring the circuit board. DIP switches are always toggle switches, with an ON position and an OFF position.

directory

Directories help keep related files organized on a disk in a hierarchical, "inverted tree" structure. Each disk has a "root" directory; for example, a <C:\> prompt normally indicates that you are at the root directory of hard-disk drive C. Additional directories that branch off of the root directory are called subdirectories. Subdirectories may contain additional directories branching off of them.

display adapter

See video adapter.

DMA

direct memory access. A DMA channel allows certain types of data transfer between RAM and a device to bypass the microprocessor.

DMI

Desktop Management Interface. DMI enables the management of your computer system's software and hardware. DMI collects information about

the system's components, such as the operating system, memory, peripheral devices, expansion cards, and asset tag. Information about the system's components is displayed as a MIF file or through the Dell Inspector program.

DMTF

Distributed Management Task Force. A consortium of companies representing hardware and software providers, of which Dell Computer Corporation is a member.

dpi

dots per inch

DPMS

Display Power Management Signaling. A standard developed by the Video Electronics Standards Association (VESA) that defines the hardware signals sent by a video controller to activate power management states in a monitor. A monitor is said to be DPMS-compliant when it is designed to enter a power management state after receiving the appropriate signal from a computer's video controller.

DRAM

dynamic random-access memory. A computer's RAM is usually made up entirely of DRAM chips. Because DRAM chips cannot store an electrical charge indefinitely, your computer continually refreshes each DRAM chip in the computer.

drive-type number

Your computer can recognize a number of specific hard-disk drives. Each is assigned a drive-type number that is stored in NVRAM. The hard-disk drive(s) specified in your computer's System Setup program must match the actual drive(s) installed in the computer. The System Setup program also allows you to specify physical parameters (logical cylinders, logical heads, cylinder number, and logical sectors per pack) for drives not included in the table of drive types stored in NVRAM.

DSP

digital signal processing

DTE

data terminal equipment. Any device, such as a computer system, that can send data in digital form by means of a cable or communications line. The DTE is connected to the cable or communications line through a data communications equipment (DCE) device such as a modem.

E

ECC

error checking and correction

ECP

Extended Capabilities Port

EEPROM

electrically erasable programmable read-only memory

EIDE

enhanced integrated drive electronics. EIDE devices add one or more of the following enhancements to the traditional IDE standard:

- Data transfer rates of up to 16 MB/sec
- Support for drives other than just hard-disk drives, such as CD-ROM and tape drives
- Support for hard-disk drives with capacities greater than 528 MB
- Support for up to two controllers, each with up to two devices attached

EISA

Extended Industry-Standard Architecture, a 32-bit expansion-bus design. The expansion-card connectors in an EISA computer are also compatible with 8- or 16-bit ISA expansion cards.

To avoid a configuration conflict when installing an EISA expansion card, you must use the EISA Configuration Utility. This utility allows you to specify which expansion slot contains the card and obtains information about the card's required system resources from a corresponding EISA configuration file.

EMC

Electromagnetic Compatibility

EMI

electromagnetic interference

EMM

expanded memory manager. A utility that uses extended memory to emulate expanded memory on computers with an Intel386™ or higher microprocessor.

EMS

Expanded Memory Specification

EPROM

erasable programmable read-only memory

ESD

electrostatic discharge

expanded memory

A technique for accessing RAM above 1 MB. To enable expanded memory on your computer, you must use an EMM. You should configure your system to support expanded memory only if you run application programs that can use (or require) expanded memory.

expansion bus

Your computer contains an expansion bus that allows the microprocessor to communicate with controllers for peripheral devices, such as a network card or an internal modem.

expansion-card connector

A connector on the computer's system board for plugging in an expansion card.

extended memory

RAM above 1 MB. Most software that can use it, such as the Windows operating system, requires that extended memory be under the control of an XMM.

external cache memory

A RAM cache using SRAM chips. Because SRAM chips operate at several times the speed of DRAM chips, the microprocessor can retrieve data and instructions faster from external cache memory than from RAM.

F

F

Fahrenheit

FAT

file allocation table. The file system structure used by MS-DOS to organize and keep track of file storage. The Microsoft Windows NT® and IBM® OS/2® operating systems can optionally use a FAT file system structure.

FCC

Federal Communications Commission

flash memory

A type of EEPROM chip that can be reprogrammed from a utility on diskette while still installed in a computer; most EEPROM chips can only be rewritten with special programming equipment.

format

To prepare a hard-disk drive or diskette for storing files. An unconditional format deletes all data stored on the disk.

ft

foot/feet

FTP

File Transfer Protocol

G

g

gram(s)

G

gravities

GB

gigabyte(s). A gigabyte equals 1,024 megabytes or 1,073,741,824 bytes.

graphics coprocessor

See coprocessor.

graphics mode

A video mode that can be defined as *x* horizontal by *y* vertical pixels by *z* colors.

group

As it relates to DMI, a group is a data structure that defines common information, or attributes, about a manageable component.

GUI

graphical user interface

H

h

hexadecimal. A base-16 numbering system, often used in programming to identify addresses in the computer's RAM and I/O memory addresses for devices. The sequence of decimal numbers from 0 through 16, for example, is expressed in hexadecimal notation as: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, 10. In text, hexadecimal numbers are often followed by *h*.

heat sink

A metal plate with metal pegs or ribs that help dissipate heat. Most microprocessors include a heat sink.

HMA

high memory area. The first 64 KB of extended memory above 1 MB. A memory manager that conforms to the XMS can make the HMA a direct extension of conventional memory. See also upper memory area and XMM.

host adapter

A host adapter implements communication between the computer's bus and the controller for a peripheral device. Hard-disk drive controller subsystems include integrated host adapter circuitry.

HPFS

High Performance File System. An option in the Microsoft Windows NT and IBM OS/2 operating systems.

Hz

hertz

I

ICES

Interface-Causing Equipment Standard (in Canada)

ICU

ISA Configuration Utility

I/O

input/output. The keyboard is an input device and a printer is an output device. In general, I/O activity can be differentiated from computational activity. For example, when a program sends a document to the printer, it is engaging in output activity; when the program sorts a list of terms, it is engaging in computational activity.

ID

identification

interlacing

A technique for increasing video resolution by only updating alternate horizontal lines on the screen. Because interlacing can result in noticeable screen flicker, most users prefer noninterlaced video adapter resolutions.

internal microprocessor cache

An instruction and data cache built into the microprocessor. The Intel Pentium microprocessor, for example, includes a 16-KB internal cache, which is set up as an 8-KB read-only instruction cache and an 8-KB read/write data cache.

IPX

Internetwork Packet eXchange

IPX/SPX

Internetwork Packet eXchange/Sequenced Packet eXchange

IRQ

interrupt request. A signal that data is about to be sent to or received by a peripheral device travels by an IRQ line to the microprocessor. Each peripheral connection must be assigned an IRQ number. For example, the first serial port in your computer (COM1) is assigned to IRQ4 by default. Two devices can share the same IRQ assignment, but you cannot operate both devices simultaneously.

ISA

Industry-Standard Architecture. A 16-bit expansion bus design. The expansion-card connectors in an ISA computer are also compatible with 8-bit ISA expansion cards.

ITE

information technology equipment

J

jumper

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. Jumpers provide a simple and reversible method of changing the circuitry in a printed circuit board.

K

K

kilo-, indicating 1,000.

KB

kilobyte(s), 1,024 bytes.

KB/sec

kilobyte(s) per second

Kbit(s)

kilobit(s), 1,024 bits.

Kbps

kilobit(s) per second

key combination

A command requiring that you press multiple keys at the same time. For example, you can reboot your computer by pressing the <Ctrl><Alt><Del> key combination.

kg

kilogram(s), 1,000 grams.

kHz

kilohertz, 1,000 hertz.

L

LAN

local area network. A LAN system is usually confined to the same building or a few nearby buildings, with all equipment linked by wiring dedicated specifically to the LAN.

lb

pound(s)

LED

light-emitting diode. An electronic device that lights up when a current is passed through it.

local bus

On a computer with local-bus expansion capability, certain peripheral devices (such as the video adapter circuitry) can be designed to run much faster than they would with a traditional expansion bus. Some local-bus designs allow peripherals to run at the same speed and with the same-width data path as the computer's microprocessor.

LPTn

The device names for the first through third parallel printer ports on your computer are LPT1, LPT2, and LPT3.

M

m

meter(s)

mA

milliampere(s) - 1/1000 of one ampere

mAh

milliampere-hour(s)

math coprocessor

See coprocessor.

Mb

megabit(s)

MB

megabyte(s). The term *megabyte* means 1,048,576 bytes; however, when referring to hard-disk drive storage, the term is often rounded to mean 1,000,000 bytes.

MB/sec

megabytes per second

Mbps

megabits per second

MBR

master boot record

MEC

memory expansion card

memory

A computer can contain several different forms of memory, such as RAM, ROM, and video memory. Frequently, the word *memory* is used as a synonym for RAM; for example, an unqualified statement such as "a computer with 16 MB of memory" refers to a computer with 16 MB of RAM.

memory address

A specific location, usually expressed as a hexadecimal number, in the computer's RAM.

memory manager

A utility that controls the implementation of memory in addition to conventional memory, such as extended or expanded memory.

memory module

A small circuit board containing DRAM chips that connects to the system board.

MHz

megahertz

microprocessor

The primary computational chip inside the computer that controls the interpretation and execution of arithmetic and logic functions. Software written for one microprocessor must usually be revised to run on another microprocessor. CPU is a synonym for microprocessor.

MIDI

musical instrument digital interface

MIF

management information format. A MIF file contains information, status, and links to component instrumentation. MIF files are installed into the MIF database by the DMI service layer. The content of a MIF is defined by a DTMF working committee and is published in the form of a MIF definition document. This document identifies the groups and attributes that are relevant to DMI-manageable components.

mm

millimeter(s)

modem

A device that allows your computer to communicate with other computers over telephone lines.

mouse

A pointing device that controls the movement of the cursor on a screen. Mouse-aware software allows you to activate commands by clicking a mouse button while pointing at objects displayed on the screen.

MPEG

Motion Picture Experts Group. MPEG is a digital video file format.

ms

millisecond(s)

MS-DOS

Microsoft Disk Operating System

MTBF

mean time between failures

multifrequency monitor

A monitor that supports several video standards. A multifrequency monitor can adjust to the frequency range of the signal from a variety of video adapters.

mV

millivolt(s)

N

NDIS

Network Driver Interface Specification

NIC

network interface controller

NLM

NetWare® Loadable Module

NMI

nonmaskable interrupt. A device sends an NMI to signal the microprocessor about hardware errors, such as a parity error.

noninterlaced

A technique for decreasing screen flicker by sequentially refreshing each horizontal line on the screen.

ns

nanosecond(s), one billionth of a second.

NTFS

NT File System. An option in the Windows NT operating system.

NVRAM

nonvolatile random-access memory. Memory that does not lose its contents when you turn off your computer. NVRAM is used for maintaining the date, time, and system configuration information.

O

OS/2

Operating System/2

OTP

one-time programmable

P

parallel port

An I/O port used most often to connect a parallel printer to your computer. You can usually identify a parallel port on your computer by its 25-hole connector.

parameter

A value or option that you specify to a program. A parameter is sometimes called a *switch* or an *argument*.

partition

You can divide a hard-disk drive into multiple physical sections called *partitions* with the **fdisk** command. Each partition can contain multiple logical drives.

After partitioning the hard-disk drive, you must format each logical drive with the **format** command.

PCI

Peripheral Component Interconnect. A standard for local-bus implementation developed by Intel Corporation.

peripheral device

An internal or external device—such as a printer, a disk drive, or a keyboard—connected to a computer.

PGA

pin grid array. A type of microprocessor socket that allows you to remove the microprocessor chip.

pixel

A single point on a video display. Pixels are arranged in rows and columns to create an image. A video resolution, such as 640 x 480, is expressed as the number of pixels across by the number of pixels up and down.

Plug and Play

An industry-standard specification that makes it easier to add hardware devices to personal computers. Plug and Play provides automatic installation and configuration, compatibility with existing hardware, and dynamic support of mobile computing environments.

POST

power-on self-test. Before the operating system loads when you turn on your computer, the POST tests various system components such as RAM, the disk drives, and the keyboard.

ppm

pages per minute

PQFP

plastic quad flat pack. A type of microprocessor socket in which the microprocessor chip is permanently mounted.

protected mode

An operating mode supported by 80286 or higher microprocessors, protected mode allows operating systems to implement:

- A memory address space of 16 MB (80286 microprocessor) to 4 GB (Intel386 or higher microprocessor)
- Multitasking
- Virtual memory, a method for increasing addressable memory by using the hard-disk drive

The Windows NT, OS/2, and UNIX® 32-bit operating systems run in protected mode. MS-DOS cannot run in protected mode; however, some programs that you can start from MS-DOS, such as the Windows operating system, are able to put the computer into protected mode.

PS/2

Personal System/2

R

RAID

redundant arrays of independent disks

RAM

random-access memory. The computer's primary temporary storage area for program instructions and data. Each location in RAM is identified by a number called a *memory address*. Any information stored in RAM is lost when you turn off your computer.

Rambus

A random-access memory architecture.

RAMDAC

random-access memory digital-to-analog converter

read-only file

A read-only file is one that you are prohibited from editing or deleting. A file can have read-only status if:

- Its read-only attribute is enabled.
- It resides on a physically write-protected diskette or on a diskette in a write-protected drive.
- It is located on a network in a directory to which the system administrator has assigned read-only rights to you.

readme file

A text file included with a software package or hardware product that contains information supplementing or updating the documentation for the software or hardware. Typically, readme files provide installation information, describe new product enhancements or corrections that have not yet been documented, and list known problems or other things you need to be aware of as you use the software or hardware.

real mode

An operating mode supported by 80286 or higher microprocessors, real mode imitates the architecture of an 8086 microprocessor.

refresh rate

The rate at which the monitor redraws the video image on the monitor screen. More precisely, the refresh rate is the frequency, measured in Hz, at which the screen's horizontal lines are recharged (sometimes also referred to as its *vertical frequency*). The higher the refresh rate, the less video flicker can be seen by the human eye. The higher refresh rates are also noninterlaced.

RFI

radio frequency interference

RGB

red/green/blue

RIMM

Rambus in-line memory module

ROM

read-only memory. Your computer contains some programs essential to its operation in ROM code. Unlike RAM, a ROM chip retains its contents even after you turn off your computer. Examples of code in ROM include the program that initiates your computer's boot routine and the POST.

rpm

revolutions per minute

RTC

real-time clock. Battery-powered clock circuitry inside the computer that keeps the date and time after you turn off the computer.

S

sec

second(s)

SEC

single-edge contact. Newer Intel processors, such as the Pentium III Xeon™ processor, use this type of connector as an interface between the processor and the system board.

serial port

An I/O port used most often to connect a modem to your computer. You can usually identify a serial port on your computer by its 9-pin connector.

service tag number

A bar code label on the computer that identifies it when you call Dell for customer or technical support.

shadowing

A computer's system and video BIOS code is usually stored on ROM chips. Shadowing refers to the performance-enhancement technique that copies BIOS code to faster RAM chips in the upper memory area (above 640 KB) during the boot routine.

SIMD

single instruction, multiple data

SIMM

single in-line memory module. A small circuit board containing DRAM chips that connects to the system board.

SMART

Self-Monitoring Analysis and Reporting Technology. A technology that allows hard-disk drives to report errors and failures to the system BIOS, which then displays an error message on the screen. To take advantage of this technology, you must have a SMART-compliant hard-disk drive and the proper support in the system BIOS.

SNMP

Simple Network Management Protocol. SNMP is an industry-standard interface that allows a network manager to remotely monitor and manage workstations.

SRAM

static random-access memory. Because SRAM chips do not require continual refreshing, they are substantially faster than DRAM chips.

SRS

sound retrieval system

SVGA

super video graphics array. VGA and SVGA are video standards for video adapters with greater resolution and color display capabilities than previous standards.

To display a program at a specific resolution, you must install the appropriate video drivers and your monitor must support the resolution. Similarly, the number of colors that a program can display depends on the capabilities of the monitor, the video driver, and the amount of video memory installed in the computer.

switch

On a computer system board, switches control various circuits or functions in your computer system. These switches are know as *DIP switches*; they are normally packaged in groups of two or more switches in a plastic case. Two common DIP switches are used on system boards: *slide* switches and *rocker* switches. The names of the switches are based on how the settings (on and off) of the switches are changed.

syntax

The rules that dictate how you must type a command or instruction so that the computer understands it.

system board

As the main circuit board, the system board usually contains most of your computer's integral components, such as:

- Microprocessor
- RAM
- Controllers for standard peripheral devices, such as the keyboard
- Various ROM chips

Frequently used synonyms for system board are *motherboard* and *logic board*.

system configuration information

Data stored in memory that tells a computer what hardware is installed and how the computer should be configured for operation.

system diskette

Synonym for bootable diskette.

system memory

Synonym for RAM.

System Setup program

A BIOS-based program that allows you to configure your computer's hardware and customize the computer's operation by setting such features as password protection and energy management. Some options in the System Setup program require that you reboot the computer (or the computer may reboot automatically) to effect a hardware-configuration change. Because the System Setup program is stored in NVRAM, any settings remain in effect until you change them again.

system.ini *file*

A start-up file for the Windows operating system. When you start Windows, it consults the **system.ini** file to determine a variety of options for the Windows operating environment. Among other things, the **system.ini** file records which video, mouse, and keyboard drivers are installed for Windows.

Revising the Control Panel settings or running the Windows Setup program may change options in the **system.ini** file. On other occasions, you may need to change or add options to the **system.ini** file manually with a text editor, such as Notepad.

T

termination

Some devices must be terminated to prevent reflections and spurious signals in the cable. When such devices are connected in a series, you may need to enable or disable the termination on these devices by changing jumper or switch settings in the configuration software for the devices.

text editor

An application program for editing text files consisting exclusively of ASCII characters. Windows Notepad is a text editor, for example. Most word processors use proprietary file formats containing binary characters, although some can read and write text files.

text mode

A video mode that can be defined as *x* columns by *y* rows of characters.

time-out

A specified period of system inactivity that must occur before an energy conservation feature is activated.

tpi

tracks per inch

TSR

terminate-and-stay-resident. A TSR program runs "in the background." Most TSR programs implement a predefined key combination (sometimes referred to as a *hot key*) that allows you to activate the TSR program's interface while running another program. When you finish using the TSR program, you can return to the other application program and leave the TSR program resident in memory for later use.

TSR programs can sometimes cause memory conflicts. When troubleshooting, rule out the possibility of such a conflict by rebooting your computer without starting any TSR programs.

U

UL

Underwriters Laboratories

UMB

upper memory blocks.

upper memory area

The 384 KB of RAM located between 640 KB and 1 MB. If the computer has an Intel386 or higher microprocessor, a utility called a *memory manager* can create UMBs in the upper memory area, in which you can load device drivers and memory-resident programs.

UPS

uninterruptible power supply. A battery-powered unit that automatically supplies power to your computer in the event of an electrical failure.

USB

Universal Serial Bus. A USB connector provides a single connection point for multiple USB-compliant devices, such as mice, keyboards, printers, and computer speakers. USB devices can also be connected and disconnected while the system is running.

utility

A program used to manage system resources—memory, disk drives, or printers, for example.

UTP

unshielded twisted pair

V

V

volt(s)

VAC

volt(s) alternating current

VCCI

Voluntary Control Council for Interference

VCR

videocassette recorder

VDC

volt(s) direct current

VESA

Video Electronics Standards Association

VGA

video graphics array. VGA and SVGA are video standards for video adapters with greater resolution and color display capabilities than previous standards.

To display a program at a specific resolution, you must install the appropriate video drivers and your monitor must support the resolution. Similarly, the number of colors that a program can display depends on the capabilities of the monitor, the video driver, and the amount of memory installed for the video adapter.

VGA feature connector

On some systems with an integrated VGA video adapter, a VGA feature connector allows you to add an enhancement adapter, such as a video accelerator, to your computer. A VGA feature connector can also be called a *VGA pass-through connector*.

video adapter

The logical circuitry that provides—in combination with the monitor—your computer's video capabilities. A video adapter may support more or fewer features than a specific monitor offers. Typically, a video adapter comes with video drivers for displaying popular application programs and operating systems in a variety of video modes.

On some Dell computers, a video adapter is integrated into the system board. Also available are many video adapter cards that plug into an expansion-card connector.

Video adapters often include memory separate from RAM on the system board. The amount of video memory, along with the adapter's video drivers, may affect the number of colors that can be simultaneously displayed. Video adapters can also include their own coprocessor for faster graphics rendering.

video driver

A program that allows graphics-mode application programs and operating systems to display at a chosen resolution with the desired number of colors. A software package may include some "generic" video drivers. Any additional video drivers may need to match the video adapter installed in the computer.

video memory

Most VGA and SVGA video adapters include memory chips in addition to your computer's RAM. The amount of video memory installed primarily influences the number of colors that a program can display (with the appropriate video drivers and monitor capability).

video mode

Video adapters normally support multiple text and graphics display modes. Character-based software displays in text modes that can be defined as *x* columns by *y* rows of characters. Graphics-based software displays in graphics modes that can be defined as *x* horizontal by *y* vertical pixels by *z* colors.

video resolution

Video resolution—800 x 600, for example—is expressed as the number of pixels across by the number of pixels up and down. To display a program at a specific graphics resolution, you must install the appropriate video drivers and your monitor must support the resolution.

virtual memory

A method for increasing addressable RAM by using the hard-disk drive. For example, in a computer with 16 MB of RAM and 16 MB of virtual memory set up on the hard-disk drive, the operating system would manage the system as though it had 32 MB of physical RAM.

virus

A self-starting program designed to inconvenience you. Virus programs have been known to corrupt the files stored on a hard-disk drive or to replicate themselves until a system or network runs out of memory.

The most common way that virus programs move from one system to another is via "infected" diskettes, from which they copy themselves to the hard-disk drive. To guard against virus programs, you should do the following:

- Periodically run a virus-checking utility on your computer's hard-disk drive.
- Always run a virus-checking utility on any diskettes (including commercially sold software) before using them.

VLSI

very-large-scale integration

Vpp

peak-point voltage

VRAM

video random-access memory. Some video adapters use VRAM chips (or a combination of VRAM and DRAM) to improve video performance. VRAM is dual-ported, allowing the video adapter to update the screen and receive new image data at the same time.

W

W

watt(s)

WH

watt-hour(s)

***win.ini** file*

A start-up file for the Windows operating system. When you start Windows, it consults the **win.ini** file to determine a variety of options for the Windows operating environment. Among other things, the **win.ini** file records what printer(s) and fonts are installed for Windows. The **win.ini** file also usually includes sections that contain optional settings for Windows application programs that are installed on the hard-disk drive.

Revising the **Control Panel** settings or running the Windows Setup program may change options in the **win.ini** file. On other occasions, you may need to change or add options to the **win.ini** file manually with a text editor such as Notepad.

Windows 95

An integrated and complete Microsoft Windows operating system that does not require MS-DOS and the provides advanced operating system performance, improved ease of use, enhanced workgroup functionality, and simplified file management and browsing.

Windows NT

High-performance server and workstation operating system software developed by Microsoft that is intended for technical, engineering, and financial applications.

write-protected

Read-only files are said to be *write-protected*. You can write-protect a 3.5-inch diskette by sliding its write-protect tab to the open position or by setting the write-protect feature in the System Setup program.

WWW

World Wide Web

X

XMM

extended memory manager. A utility that allows application programs and operating systems to use extended memory in accordance with the XMS.

XMS

eXtended Memory Specification

Z

ZIF

zero insertion force. Some computers use ZIF sockets and connectors to allow devices such as the microprocessor chip to be installed or removed with no stress applied to the device.

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Hardware Configuration Features: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- Jumpers—A General Explanation
- System Board Labels
- I/O Ports and Connectors
- Interrupt Assignments
- Memory Allocations

Overview

This section provides specific information about the jumpers on your system board and the input/output (I/O) ports and connectors on the back panel of your computer. It also provides some basic information on jumpers and switches, a listing of interrupt request (IRQ) assignments, and memory maps.

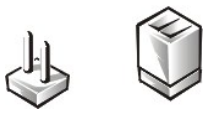
Jumpers—A General Explanation

Jumpers provide a convenient and reversible way of reconfiguring the circuitry on a printed circuit board. When you reconfigure your system, you may need to change jumper settings on your system board.

Jumpers

Jumpers are small blocks on a circuit board with two or more pins emerging from them (see Figure 1). Plastic plugs containing a wire fit down over the pins. The wire connects the pins and creates a circuit.

Figure 1. Jumpers



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

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

A jumper is referred to as *open* or *unjumpered* 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 *jumpered*. The jumper setting is often shown in text as two numbers, such as *1-2*. The number 1 is printed on the system board so that you can identify each pin number based on the location of pin 1. When multiple jumpers are in a row, all pin 1s are on the same side.

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

Figure 2. System Board Jumpers

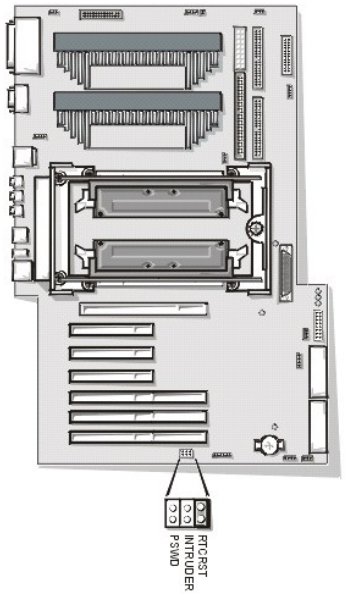


Table 1. System Board Jumper Settings

Jumper	Setting	Description
RTCRST		Resets the RTC clock and CMOS contents when jumpered
INTRUDER		Intrusion detection disabled. Intrusion detection enabled.
PSWD		Password features enabled. Password features disabled.
jumpered unjumpered		
NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.		

System Board Labels

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

Table 2. System Board Connectors and Sockets

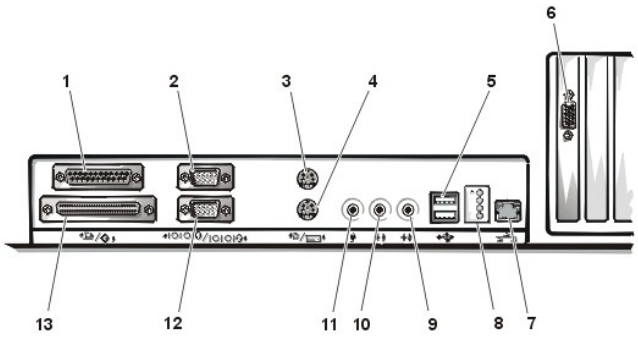
Connector or Socket	Description
AGP	AGP video card connector
AUX	Aux-in audio card connector
AUX LED	Hard-disk drive access indicator connector
BATTERY	Battery socket
BAY_PWR	External bay devices power connector (CD-ROM drive, optional diskette drive, etc.)
CD-IN	CD-ROM drive audio interface connector
DISKETTE	Diskette drive interface connector
ENET	NIC connector
FAN	Microprocessor fan connector
FAN_CCAG	Card cage fan speed control connector
FAN_CPU	CPU fan connector
FAN_H1	Processor 1 heat sink fan
FAN_H2	Processor 2 heat sink fan
FAN_SYS	System fan
IDE*n*	EIDE interface connector

KYBD/MOUSE	Keyboard connector and mouse connector (stacked)
LAN	Wakeup On LAN card connector
LINE-IN	Audio line-in jack
LINE-OUT	Audio line-out jack
MEC_A	MEC socket (channel A)
MEC_B	MEC socket (channel B)
MIC	Microphone jack
PANEL	Control panel connector
PARALLEL/SCSI	Parallel port connector (sometimes referred to as LPT1) and SCSI connector (stacked)
PCI1, PCI2, PCI3, PCI4	32-bit PCI expansion-card connectors
PCI5, PCI6	64-bit PCI expansion-card connectors
MT PWR1	Main power input connector
MT PWR2	Main power input connector
RAID	Optional RAID PCI expansion card connector extension
SCSI_NARROW	Secondary SCSI connector
SCSI_ULTRA2	Primary SCSI connector
SERIAL1/2	Serial port connectors (sometimes referred to as COM1 and COM2; stacked)
S2_PRI	Primary Intel® Pentium® III Xeon™ microprocessor SEC cartridge connector
S2_SEC	Secondary Pentium III Xeon processor SEC cartridge connector
TAPI	TAPI input card connector (voice modem to audio system interface)
USB	USB connectors
WUOL	Wake-Up on LAN connector
NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.	

I/O Ports and Connectors

The I/O ports and connectors on the back panel of your computer are the gateways through which your computer system communicates with external devices, such as a keyboard, mouse, printer, and monitor. Figure 3 identifies the I/O ports and connectors for your system.

Figure 3. I/O Ports and Connectors



1 Parallel port connector
2 Serial port 1 connector
3 Mouse connector
4 Keyboard connector
5 USB connectors
6 Video connector (may be in first or second expansion slot)
7 NIC connector
8 Diagnostic LEDs (See Messages and Codes.)
9 Audio line-in jack
10 Audio line-out jack
11 Microphone jack
12 Serial port 2 connector
13 External SCSI connector

Serial and Parallel Ports Overview

The two built-in serial ports use 9-pin D-subminiature connectors on the back panel. These ports support devices such as external modems, printers, plotters, and mice that require serial data transmission (the transmission of data one bit at a time over one line).

Most software uses the term COM (for COMmunications) plus a number to designate a serial port. The default designations of your computer's integrated serial ports are COM1 and COM2.

The integrated parallel port uses a 25-pin D-subminiature connector on the computer's back panel. This I/O port sends data in parallel format (where eight data bits, or one byte, are sent simultaneously over eight separate lines in a single cable). The parallel port is used primarily for printers.

Most software uses the term LPT (for Line Print Terminal) plus a number to designate a parallel port. The default designation of your computer's built-in parallel port is LPT1.

Port designations are used, for example, in software installation procedures that include a step in which you identify the port to which your printer is attached, thus telling your software where to send its output. An incorrect designation prevents the printer from printing or causes scrambled print.

Serial Port Connectors

If you reconfigure your hardware, you may need pin number and signal information for the serial port connectors. Figure 4 illustrates the pin numbers for the serial port connectors, and Table 3 lists and defines the pin assignments and interface signals for the serial port connectors.

Figure 4. Pin Numbers for the Serial Port Connectors

Table 3. Pin Assignments for the Serial Port Connectors

Pin	Signal	I/O	Definition
1	DCD	I	Data carrier detect
2	SIN	I	Serial input
3	SOUT	O	Serial output
4	DTR	O	Data terminal ready
5	GND	N/A	Signal ground
6	DSR	I	Data set ready
7	RTS	O	Request to send
8	CTS	I	Clear to send
9	RI	I	Ring indicator
Shell	N/A	N/A	Chassis ground

Parallel Port Connector

If you reconfigure your hardware, you may need pin number and signal information for the parallel port connector. Figure 5 illustrates the pin numbers for the parallel port connector, and Table 4 lists and defines the pin assignments and interface signals for the parallel port connector.

Figure 5. Pin Numbers for the Parallel Port Connector

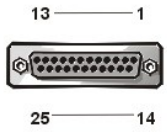


Table 4. Pin Assignments for the Parallel Port Connector

Pin	Signal	I/O	Definition
1	STB#	I/O	Strobe
2	PD0	I/O	Printer data bit 0

3	PD1	I/O	Printer data bit 1
4	PD2	I/O	Printer data bit 2
5	PD3	I/O	Printer data bit 3
6	PD4	I/O	Printer data bit 4
7	PD5	I/O	Printer data bit 5
8	PD6	I/O	Printer data bit 6
9	PD7	I/O	Printer data bit 7
10	ACK#	I	Acknowledge
11	BUSY	I	Busy
12	PE	I	Paper end
13	SLCT	I	Select
14	AFD#	O	Automatic feed
15	ERR#	I	Error
16	INIT#	O	Initialize printer
17	SLIN#	O	Select in
18-25	GND	N/A	Signal ground

External SCSI Connector

The 68-pin external small computer system interface (SCSI) connector on the system back panel supports external Ultra SCSI devices such as scanners, zip drives, and optical drives.

If you reconfigure your hardware, you may need pin number and signal information for the external SCSI connector. Figure 6 illustrates the pin numbers for the external SCSI connector, and Table 5 lists and defines the pin assignments and interface signals for the external SCSI connector.

Figure 6. Pin Numbers for the External SCSI Connector

Table 5. Pin Assignments for the External SCSI Connector

Pin	Signal	I/O	Definition
1-16	GND	N/A	Signal ground
17-18	TRMPWR	N/A	Terminator power
19	RSVD	N/A	Reserved
20-34	GND	N/A	Signal ground
35	D12	I/O	SCSI data bit 12
36	D13	I/O	SCSI data bit 13
37	D14	I/O	SCSI data bit 14
38	D15	I/O	SCSI data bit 15
39	DPARH	I/O	SCSI data parity high
40	D0	I/O	SCSI data bit 0
41	D1	I/O	SCSI data bit 1
42	D2	I/O	SCSI data bit 2
43	D3	I/O	SCSI data bit 3
44	D4	I/O	SCSI data bit 4
45	D5	I/O	SCSI data bit 5
46	D6	I/O	SCSI data bit 6
47	D7	I/O	SCSI data bit 7

48	DPARL	I/O	SCSI data parity low
49-50	GND	N/A	Signal ground
51-52	TRMPWR	N/A	Terminator power
53	RSVD	N/A	Reserved
54	GND	N/A	Signal ground
55	ATN	I/O	SCSI attention
56	GND	N/A	Signal ground
57	BSY	I/O	SCSI busy
58	ACK	I/O	SCSI acknowledge
59	RST	I/O	SCSI reset
60	MSG	I/O	SCSI message
61	SEL	I/O	SCSI select
62	C/D	I/O	SCSI command/data
63	REQ	I/O	SCSI request
64	I/O	I/O	SCSI in/out
65	D8	I/O	SCSI data bit 8
66	D9	I/O	SCSI data bit 9
67	D10	I/O	SCSI data bit 10
68	D11	I/O	SCSI data bit 11

Keyboard and Mouse Connectors Overview

Your system uses a Personal System/2 (PS/2)-style keyboard and supports a PS/2-compatible mouse. Cables from both devices attach to 6-pin miniature *Deutsche Industrie Norm* (DIN) connectors on the back panel of your computer. Either device can connect to either connector.

A PS/2-compatible mouse works identically to an industry-standard serial mouse or bus mouse except that it has its own dedicated connector, which frees up both serial ports and does not require an expansion card. Circuitry inside the mouse detects the movement of a small ball and relays the direction to the computer.

Mouse driver software can give the mouse priority with the microprocessor by issuing IRQ12 whenever a new mouse movement is made. The driver software also passes along the mouse data to the application program that is in control.

Keyboard Connector

If you reconfigure your hardware, you may need pin number and signal information for the keyboard connector. Figure 7 illustrates the pin numbers for the keyboard connector, and Table 6 lists and defines the pin assignments and interface signals for the keyboard connector.

Figure 7. Pin Numbers for the Keyboard Connector

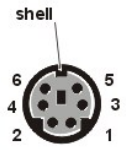


Table 6. Pin Assignments for the Keyboard Connector

Pin	Signal	I/O	Definition
1	KBDATA	I/O	Keyboard data
2	NC	N/A	No connection
3	GND	N/A	Signal ground
4	FVcc	N/A	Fused supply voltage
5	KBCLK	I/O	Keyboard clock
6	NC	N/A	No connection
Shell	N/A	N/A	Chassis ground

Mouse Connector

If you reconfigure your hardware, you may need pin number and signal information for the mouse connector. Figure 8 illustrates the pin numbers for the mouse connector, and Table 7 lists and defines the pin assignments and interface signals for the mouse connector.

Figure 8. Pin Numbers for the Mouse Connector

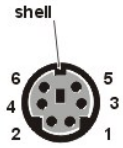


Table 7. Pin Assignments for the Mouse Connector

Pin	Signal	I/O	Definition
1	MFDATA	I/O	Mouse data
2	NC	N/A	No connection
3	GND	N/A	Signal ground
4	FVcc	N/A	Fused supply voltage
5	MFCLK	I/O	Mouse clock
6	NC	N/A	No connection

Video Connector

For information on your video connector, see the manufacturer's specifications that came with your video card.

NIC Connector

Your system contains an RJ45 network interface controller (NIC) connector (see Figure 9) on the back panel for attaching an unshielded twisted pair (UTP) Ethernet cable, which is used in 10BASE-T and 100BASE-TX networks. The NIC provides all the functions normally handled by a separate network expansion card. To connect your system to and configure it for use on an Ethernet network, see "Using the Network Interface Controller."

Figure 9. NIC Connector

USB Connectors

Your system contains two Universal Serial Bus (USB) connectors for attaching USB-compliant devices. USB devices are typically peripherals such as keyboards, mice, printers, and computer speakers.

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

If you reconfigure your hardware, you may need pin number and signal information for the USB connectors. Figure 10 illustrates the pin numbers for the USB connectors, and Table 8 lists and defines the pin assignments and interface signals for the USB connectors.

Figure 10. Pin Numbers for the USB Connectors

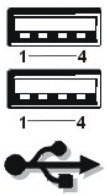


Table 8. Pin Assignments for the USB Connectors

Pin	Signal	I/O	Definition
1	Vcc	N/A	Supply voltage
2	DATA	I	Data in
3	+DATA	O	Data out
4	GND	N/A	Signal ground

Microphone Jack

You can use the microphone jack (see Figure 11) to attach a standard personal computer microphone. Connect the audio cable from the microphone to the microphone jack. The microphone input is a mono source with maximum signal levels of 130 millivolts root mean squared (mVrms).

NOTE: Do not use standard microphones. Use only microphones designed for use with computers.

Figure 11. Microphone Jack

Audio Line-Out Jack

You can use the audio line-out jack (see Figure 12) to attach most self-powered computer speakers with integrated amplifiers. The audio line-out jack is amplified enough to power most head phones. Connect the audio cable from the speakers to this jack.

NOTE: Do not use unpowered speakers. Use only self-powered speakers with integrated amplifiers.

Figure 12. Audio Line-Out Jack

Audio Line-In Jack

You can use the audio line-in jack (see Figure 13) to attach record/playback devices such as cassette players, CD players, and VCRs. Connect the line-out cable from any of these devices to the audio line-in jack on the back of your computer.

Figure 13. Audio Line-In Jack

Interrupt Assignments

Problems can arise if two devices attempt to use the same IRQ line. To avoid this type of conflict, check the documentation for the default IRQ line setting for each installed device. Then consult Table 9 to configure each device for one of the available IRQ or other lines.

NOTE: Interrupts for the integrated sound, NIC, and both SCSI channels are assigned dynamically by the computer's basic input/output system (BIOS).

Table 9. Interrupt Assignments

IRQ Line	Used By/Available
IRQ0	System timer
IRQ1	Keyboard controller
IRQ2	Interrupt controller (enables IRQ8 through IRQ15)
IRQ3 and IRQ4	Serial ports (if enabled in System Setup program)
IRQ5	Available
IRQ6	Diskette drive interface
IRQ7	Parallel port (if enabled in System Setup program)
IRQ8	RTC
IRQ9	ACPI
IRQ10	Available
IRQ11	Available
IRQ12	Mouse controller
IRQ13	Math coprocessor
IRQ14	Primary EIDE interface (if enabled in System Setup program)
IRQ15	Secondary EIDE interface (if enabled in System Setup program)
NOTE: For the full name of an abbreviation or acronym used in the table, see the Glossary.	

Memory Allocations

A microprocessor and programs operating under MS-DOS® (real-mode operation) can address only 1 megabyte (MB) (1024 kilobytes [KB]) of system memory. This area is divided into *conventional memory* (sometimes called *base memory*) and *upper memory*. All system memory above this 1 MB is called *extended memory* and cannot be directly addressed by MS-DOS-based programs without the aid of memory-managing software.

Table 10 provides a map of the conventional memory area. When the processor or a program addresses a location within the conventional memory range, it is physically addressing a location in main memory, which is the only area of memory it can address under MS-DOS.

Table 10. Conventional Memory Map

Address Range	Use
00000h-003FFh	Interrupt vector table
00400h-004FFh	BIOS data area
00500h-005FFh	MS-DOS and BASIC work area
00600h-0FFFFh	User memory
10000h-1FFFFh	User memory
20000h-2FFFFh	User memory
30000h-3FFFFh	User memory
40000h-4FFFFh	User memory
50000h-5FFFFh	User memory
60000h-6FFFFh	User memory
70000h-7FFFFh	User memory
80000h-8FFFFh	User memory
90000h-9FBFFh	User memory
NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.	

Table 11 provides a map of the upper memory area. Some of these addresses are dedicated to various system devices, such as the system BIOS. Others are available for use by expansion cards and/or an expanded memory manager (EMM). When the microprocessor or a program addresses a location within the upper memory area, it is physically addressing a location within one of these devices.

Table 11. Upper Memory Map

Address Range	Use

0009FC00-0009FFFF	PS/2-mouse data area
000A0000-000BFFFF	Video RAM
000C0000-000C7FFF	Video BIOS
000C8000-000EFFFF	Available
000F0000-000FFFFF	System BIOS
00100000-0010FFEF	High memory area
0010FFF0-3FFFFFFF	Extended memory
40000000-FFFBFFFF	Reserved
FFFC0000-FFFFFFFF	BIOS ROM
NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.	

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- Help Tools
- Problems With Your Order
- Product Information
- Returning Items for Warranty Repair or Credit
- Before You Call

Technical Assistance

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

1. Run the Dell Diagnostics.
2. Make a copy of the Diagnostics Checklist and fill it out.
3. Use Dell's extensive suite of online services available at Dell's World Wide Web site (**http://www.dell.com**) for help with installation and troubleshooting procedures.
4. 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."

Help Tools

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

NOTE: Some of the following 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 computer 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.

You can contact Dell electronically by 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/

  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.

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 the contact numbers for your region.

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 the contact numbers for your region.

TechConnect BBS

Use your modem to access Dell's TechConnect bulletin board service (BBS) 24 hours a day, seven days a week. The service is menu-driven and fully interactive. The protocol parameters for the BBS are 1200 to 19.2K baud, 8 data bits, no parity, 1 stop bit.

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 the contact numbers for your region.

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 pride themselves on their track record: more than 90 percent of all problems and questions are taken care of in just one toll-free call, usually in less than 10 minutes. When you call, our experts can refer to records kept on your Dell system to better understand your particular question. Our technical support staff uses computer-based diagnostics to provide fast, accurate answers to questions.

To contact Dell's technical support service, see "Before You Call" and then call the number for your country as listed in "Contacting Dell."

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 the contact numbers for your region.

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 "Contacting Dell."

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 the contact numbers for your region.

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. If possible, turn on your system before you call Dell for technical assistance and call from a telephone at or near the computer. 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 computer system itself. Make sure the system documentation is available.

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

Diagnostics Checklist

Date:
Name:
Address:
Phone number:
Service tag (bar code on the back of the computer):
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:
Refer to your operating system documentation to determine the contents of the system's start-up files. If the computer 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:

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Working Inside Your Computer: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- Before You Begin
- Removing the Computer Cover
- Replacing the Computer Cover
- Removing and Replacing the AGP Card Brace
- Inside Your Computer
- Rotating the Power Supply Away From the System Board

Overview

Your Dell Precision 620 system supports a variety of internal options that expand system capabilities. This section prepares you to install options inside the computer. It describes how to remove and replace the computer cover and rotate the power supply away from the system board. It also familiarizes you with the internal components that you may handle if you install Dell™ hardware options.

Before You Begin

To make working inside your computer easier, make sure that you have adequate lighting and a clean work space. If you temporarily disconnect cables or remove expansion cards, note the position of the connectors and slots so that you can reassemble the system correctly.

You will use the information in this section every time you install a hardware option inside your computer. *Read this section carefully*, because the information is not repeated in detail elsewhere in this guide.

Safety First—For You and Your Computer

Working inside your computer is safe if you observe the following precautions.

CAUTION FOR YOUR PERSONAL SAFETY AND PROTECTION OF YOUR EQUIPMENT

Before starting to work on your computer, perform the following steps in the sequence indicated:

1. Turn off your computer and all peripherals.
2. Disconnect your 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.

   To verify that all power has been removed from the system, make sure that the standby power light-emitting diode (LED) on the system board has gone out. For the location of this LED, see Figure 1 in "Installing System Board Options."
4. Touch an unpainted metal surface on the computer chassis, such as the power supply, before touching anything inside your computer.

   While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might harm internal components. Also avoid touching components or contacts on a card and avoid touching pins on a chip.

In addition, Dell recommends that you periodically review the safety instructions in your *Dell Precision WorkStations System Information Guide*.

Unpacking Your Hardware Option

When you remove an option from its shipping carton, you may find it wrapped in antistatic packing material designed to protect it from electrostatic damage. Do not remove the packing material until you are ready to install the option.

NOTICE: See "Protecting Against Electrostatic Discharge" in your *Dell Precision WorkStations System Information Guide*.

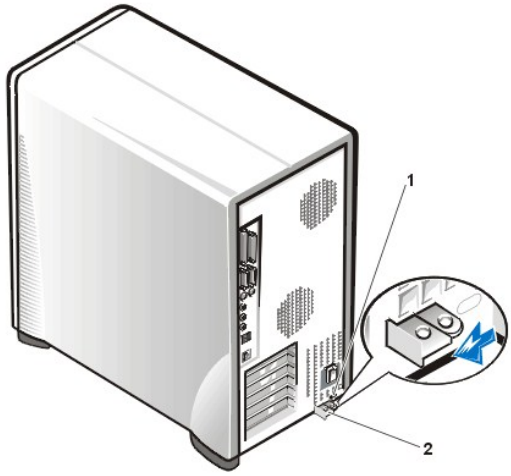
Removing the Computer Cover

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

1. Turn off your computer and peripherals, and unplug the computer from its electrical outlet before you remove the computer cover.

2. If you have installed a padlock through the padlock ring on the back panel (see Figure 1), remove the padlock.
3. Slide the padlock ring to the open position.

Figure 1. Padlock Installed

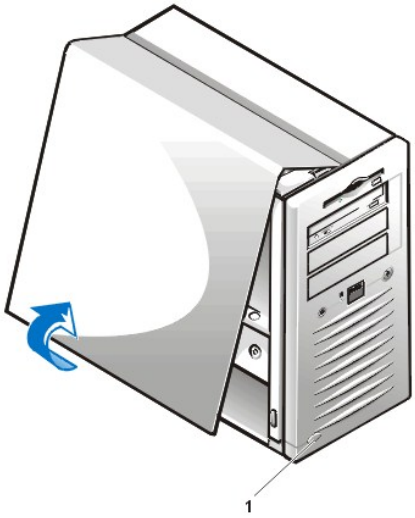


1 Security cable slot

2 Padlock ring

4. Facing the left side cover, press the release button (located at the bottom-left corner of the front bezel) and lift the bottom of the cover, allowing it to pivot up toward you (see Figure 2).
5. Disengage the tabs that secure the cover to the top of the chassis, and lift the cover away.

Figure 2. Removing the Computer Cover

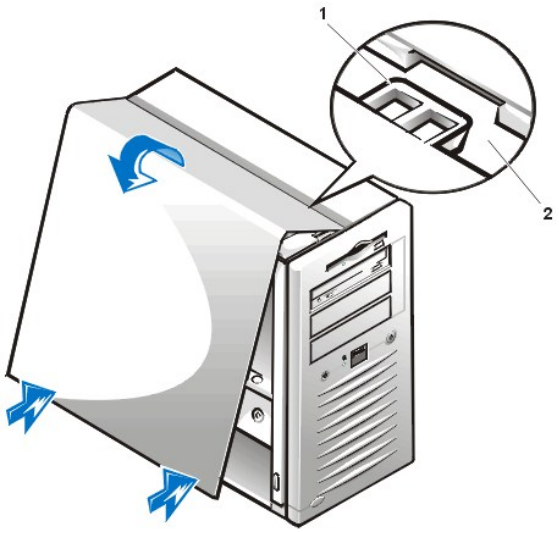


1 Release button

Replacing the Computer Cover

1. Check all cable connections, especially those that might have come loose during your work. Fold cables out of the way so that they do not catch on the computer cover. Make sure cables are not routed over the drive cage—they will prevent the cover from closing properly.
2. Check to see that no tools or extra parts (including screws) are left inside the computer's chassis.
3. Facing the left side of the computer, hold the cover at a slight angle as shown in Figure 3, and then align the top of the cover with the top of the chassis. Hook the three tabs on the cover into the three recessed slots on the computer chassis so that the tabs catch the hooks inside the slots.
4. Pivot the cover down toward the bottom of the chassis and into position. Using both hands, press against the bottom edge of the cover and ensure that all of the securing hooks at the bottom of the cover click into place.

Figure 3. Replacing the Computer Cover



1 Hook

2 Recessed slot

5. Slide the padlock ring to the closed position. If you are using a padlock to secure your system, reinstall the padlock.
6. Replace the computer cover, reconnect the network cable and phone line if present, reconnect your computer and peripherals to their electrical outlets, and turn them on.

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

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

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

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

Removing and Replacing the AGP Card Brace

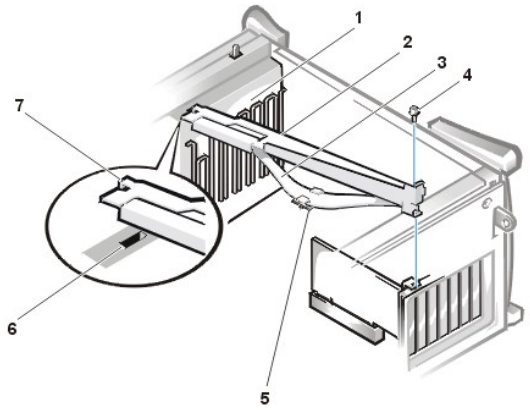
To access any expansion cards and some components on the system board, you must first remove the accelerated graphics port (AGP) card brace that secures an AGP card in the AGP socket.

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

NOTE: The AGP card brace is not required for proper system operation, and can be removed after the system is set up. If you remove the AGP card brace, save it for reinstallation before you move or ship the system.

1. Remove the computer cover.
2. Remove the screw that secures the AGP card brace through the AGP expansion card's mounting bracket to the back of the chassis (see Figure 4).

Figure 4. Removing the AGP Card Brace



1 Card guide (front of chassis)

2 AGP card brace

3 Card brace spring

4 Screw

5 Plastic card guide

6 Slot

7 Tab

3. Slide the card brace forward until it disengages from the slot in the card guide located on the front of the chassis, and then rotate the brace up and lift it away from the chassis.
4. Replace the screw to secure the AGP card's mounting bracket to the back of the chassis.

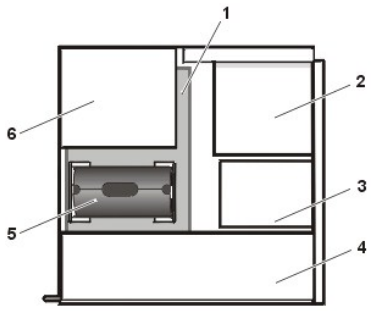
To replace the brace, perform the following steps:

1. Insert the tab on one end of the brace into the slots on the card guide located on the front of the chassis (see Figure 4).
2. Lower the brace, ensuring that the plastic AGP card guide, located on the bottom of the brace, is engaged with the top of the AGP card.
3. Replace the screw that secures the brace through the AGP expansion card's mounting bracket to the chassis.

Inside Your Computer

Figure 5 shows a side view of a mini tower chassis to help you orient yourself when installing hardware options. Unless otherwise specified, locations or directions relative to the computer are as shown.

Figure 5. Computer Orientation View



1 System board

2 Externally accessible drives

3 Internally accessible drives

4 Power supply

5 Memory expansion card assembly

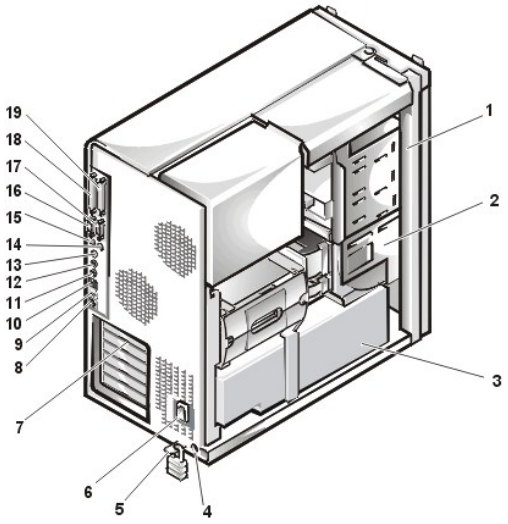
6 Processor retention bracket

Figure 6 shows a mini tower chassis with its cover removed. Refer to this illustration to locate interior features and components of the Mini Tower chassis discussed in this guide.

Figure 6. Inside the Chassis

1 Externally accessible drive bays

2 Hard-disk drive cage



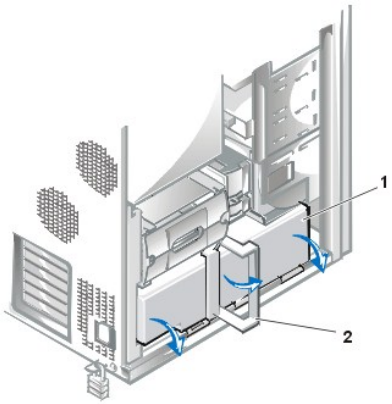
3 Power Supply
4 Cable lock slot
5 Padlock ring (with padlock)
6 AC power receptacle
7 Expansion-card slots
8 Integrated network controller connector
9 Diagnostic LEDs
10 Two USB connectors
11 Audio line-in connector
12 Audio line-out connector
13 Microphone connector
14 PS/2 mouse connector
15 PS/2 keyboard connector
16 Serial port 2 connector
17 Serial port 1 connector
18 SCSI port connector
19 Parallel port connector

Rotating the Power Supply Away From the System Board

To access some components on the system board, you may have to rotate the system power supply out of the way. To rotate the power supply, perform the following steps:

1. Remove the computer cover.
2. Disconnect the AC power cable from the AC power receptacle on the back of the power supply (see Figure 7).

Figure 7. Rotating the Power Supply



1 Power supply
2 Handle

3. Pull the green handle out and slide the power supply forward. With the handle pulled out, rotate the power supply down to a vertical position.

To return the power supply to its original position, perform the following steps.

1. Rotate the power supply to its original position and hold it there (see Figure 7).
2. Rotate the green handle towards the back of the system until it is closed.

   Make sure the handle latches the power supply properly and the power supply slides slightly to the back of the system and locks in place.
3. Replace the cover.
4. Reconnect the AC power cable to the AC power receptacle on the back of the power supply.

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Internal Components: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- Safety First—For You and Your Computer
- Removing and Replacing the Computer Cover
- Troubleshooting a Wet Computer
- Troubleshooting a Damaged Computer
- Troubleshooting the Battery
- Troubleshooting Expansion Cards
- Troubleshooting System Memory
- Troubleshooting the Video Subsystem
- Troubleshooting the System Board
- Troubleshooting a Dead System Board with the RTCRST Jumper
- Troubleshooting Drives

Overview

This section provides troubleshooting procedures for components inside your computer. Before you start any of the procedures in this section, do the following:

- Perform the procedures described in "Checking Connections and Switches" and "System Setup."
- Read the safety instructions in "Safety First—For You and Your Computer."

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

- The *Dell Precision ResourceCD*
- A small flat-blade screwdriver and a #1 Phillips-head screwdriver (or quarter-inch hex-nut driver)

Your system also includes an interior system service label affixed to the inside of the computer cover (see Figure 1 for the location of this label). This label shows the location of components within the chassis and locations of system board components and connectors. It also contains an important notice that provides instructions you need to follow to help prevent damage to your system board while you troubleshoot your computer system.

Figure 1. Mini Tower Chassis Interior Service Label

Safety First—For You and Your Computer

The procedures in this section require that you remove the cover and work inside your computer. While working inside your computer, do not attempt to service the computer except as explained in this guide and elsewhere in Dell™ documentation. Always follow the instructions closely.

Working inside your computer is safe—*if* you observe the following precautions.

⚠ CAUTION FOR YOUR PERSONAL SAFETY AND PROTECTION OF THE EQUIPMENT

Before you start to work on the computer, perform the following steps:

1. **Turn off the computer and all peripherals.**
2. **Touch an unpainted metal surface on the computer chassis, such as the metal around the card-slot openings at the back of your computer, before touching anything inside your computer.**

3. **Disconnect the computer and peripherals from their electrical outlets. Doing so reduces the potential for personal injury or shock. Also disconnect any telephone or telecommunication cables from the computer.**

   NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power light-emitting diode (LED) on the system board has turned off. For the location of this LED, see Figure 1 in "Installing System Board Options."

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

In addition, Dell recommends that you periodically review the safety instructions in your *System Information Guide*.

Removing and Replacing the Computer Cover

See "Removing the Computer Cover" and "Replacing the Computer Cover."

Troubleshooting a Wet Computer

NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of this LED, see Figure 1 in "Installing System Board Options."

Liquids can damage your computer. While you are not likely to submerge your computer, spills, splashes, and excessive humidity can also cause damage. If an external device (such as a printer or an external drive) gets wet, contact the manufacturer for instructions. If your computer gets wet, perform the following steps:

1. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from their electrical outlets. Also, disconnect any telephone or telecommunication cables from the computer.

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

2. Remove the computer cover.
3. Let the computer dry for at least 24 hours. Make sure that it is thoroughly dry before you proceed.
4. Remove the accelerated graphics port (AGP) card brace according to the instructions in "Removing and Replacing the AGP Card Brace."
5. Remove all expansion cards installed in the computer except a drive controller card and video expansion card.
6. Replace the computer cover, reconnect the system to an electrical outlet, and turn it on.

   If the system has power, proceed to step 7.

   If the system does not have power, see "Getting Help" for instructions on obtaining technical assistance.
7. Turn off the system, disconnect it from the electrical outlet, remove the computer cover, and reinstall all expansion cards that you removed in step 5.
8. Replace the AGP card brace.
9. Replace the computer cover, and reconnect the system to an electrical outlet. Also, reconnect any telephone or telecommunication cables to the computer.
10. Insert the *Dell Precision ResourceCD* into the CD-ROM drive, reboot the system, and run the **System Board Devices** test group in the Dell Diagnostics.

    If the tests complete successfully, your system is operating properly. If any of the tests fail, see "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting a Damaged Computer

NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of this LED, see Figure 1 in "Installing System Board Options."

If your computer was dropped or damaged, you should check your computer to see if it functions properly. If an external device attached to your computer is dropped or damaged, contact the manufacturer of the device for instructions or see "Getting Help" for information on obtaining technical assistance from Dell. To troubleshoot a damaged computer, perform the following steps:

1. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from their electrical outlets. Also, disconnect any telephone or telecommunication cables from the computer.

CAUTION: Before you remove the computer cover, see "Safety First—For Your and Your Computer."

2. Remove the computer cover.
3. Check all the expansion-card connections in the computer.
4. Check the diskette/tape drive, hard-disk drive, and all other internal connections to make sure that all cables are properly connected and that all components are properly seated in their connectors and sockets.
5. Replace the computer cover, reconnect the system to an electrical outlet, and reconnect any telephone or telecommunication cables.
6. Insert the *Dell Precision ResourceCD* into the CD-ROM drive, and reboot the system.
7. Run the **System Board Devices** test group in the Dell Diagnostics.

   If the tests complete successfully, your system is operating properly. If any of the tests fail, see "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting the Battery

CAUTION: A new battery might explode if you install it incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of this LED, see Figure 1 in "Installing System Board Options."

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

To troubleshoot the battery, perform the following steps:

1. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from their electrical outlets. Also, disconnect any telephone or telecommunication cables from the computer.

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

2. Remove the computer cover.
3. Reseat the battery in its socket.

   The battery is a coin cell that snaps into a socket on the system board.
4. Replace the computer cover and restart the system.
5. If the problem is not resolved, replace the battery.

   Your Dell system uses a 3-V CR2032 coin cell battery.

If the problem is still not resolved, you may have a faulty system board. See "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting Expansion Cards

NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of this LED, see Figure 1 in "Installing System Board Options."

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. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from their electrical outlets. Also, disconnect any telephone or telecommunication cables from the computer.

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

2. Remove the computer cover.

3. Remove the AGP card brace according to the instructions in "Removing and Replacing the AGP Card Brace."
4. Verify that each expansion card is firmly seated in its connector. If any expansion cards are loose, reseat them.
5. Verify that any cables are firmly connected to their corresponding connectors on the expansion cards. If any cables appear loose, reconnect them.

   For instructions on which cables should be attached to specific connectors on an expansion card, see the expansion card's documentation.
6. Remove all expansion cards except the video card.
7. Replace the computer cover, reconnect the system to an electrical outlet, and turn it on.
8. Insert the *Dell Precision ResourceCD* into the CD-ROM drive, reboot the system, and run the **RAM** test group in the Dell Diagnostics.

   If the tests complete successfully, proceed to step 9. If any of the tests fail, see "Getting Help" for information on obtaining technical assistance.
9. Turn off the system, disconnect it from the electrical outlet, and remove the computer cover.
10. Reinstall one of the expansion cards that you removed previously, and repeat steps 6 and 7.

    If any of the tests fail, the expansion card you just reinstalled is faulty and needs to be replaced. If the tests complete successfully, repeat steps 8 and 9 with another expansion card.

If you have replaced all the expansion cards removed previously and the expansion card problem is not resolved, see "Getting Help" for information on obtaining technical assistance.

Troubleshooting System Memory

NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of this LED, see Figure 1 in "Installing System Board Options."

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

When you turn on or reboot the system, the Caps Lock and Scroll Lock indicators on the keyboard should flash momentarily and then turn off. If the **Num Lock** option in System Setup is set to **On**, the Num Lock indicator should flash momentarily and then remain on; otherwise, it should turn off. Abnormal operation of these indicators can result from a defective memory module. To troubleshoot system memory, perform the following steps:

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

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

2. If an error message indicates invalid system configuration information, enter System Setup and check the **System Memory** option. If the amount of memory displayed does not match the amount of memory installed, turn off the computer, disconnect it from the electrical outlet, remove the computer cover, and reseat the memory modules in their sockets.
3. Replace the computer cover, reconnect the system to an electrical outlet, and turn it on.
4. If the problem is not resolved, insert the *Dell Precision ResourceCD* into the CD-ROM drive, reboot the system, and run the **RAM** test group in the Dell Diagnostics.

If the Dell Diagnostics identifies a faulty memory module, replace that memory module. If the Dell Diagnostics determines that the system board is faulty, or if the Dell Diagnostics does not identify the cause of the problem and the problem is still not resolved, see "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting the Video Subsystem

NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of this LED, see Figure 1 in "Installing System Board Options."

Troubleshooting video problems involves determining which of the following is the source of the problem: the monitor, the monitor interface cable, or the integrated video subsystem.

Before attempting to troubleshoot the video subsystem, perform the procedure found in "Troubleshooting the Monitor" to determine whether or not the monitor is the source of the problem.

If the monitor is not at fault, perform the following steps:

1. Check the monitor cable connections as indicated in "Checking Connections and Switches."
2. If the problem is not resolved, insert the *Dell Precision ResourceCD* into the CD-ROM drive, and reboot the system. Run the **Video** test group in the Dell Diagnostics.

   If any of the tests fail, see "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting the System Board

NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of this LED, see Figure 1 in "Installing System Board Options."

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:

1. Insert the *Dell Precision ResourceCD* into the CD-ROM drive, and reboot the system. Run the **System Board Devices** test group in the Dell Diagnostics.

   If any of the tests fail, see "Getting Help" for instructions on obtaining technical assistance.
2. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from their electrical outlets. Also, disconnect any telephone or telecommunication cables from the computer.

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

3. Remove the computer cover.
4. Remove the AGP card brace according to the instructions in "Removing and Replacing the AGP Card Brace."
5. Verify that the power cables from the power supply are firmly connected to the connectors on the system board.
6. Replace the AGP card brace.
7. Replace the computer cover, reconnect the system to an electrical outlet, and turn it on. If the problem is not resolved, proceed to step 8.
8. Perform the procedure in "Troubleshooting Expansion Cards."

   If the problem is not resolved, proceed to step 9.
9. Perform the procedure in "Troubleshooting the Keyboard."

   If the problem is still not resolved, see "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting a Dead System Board With the RTCRST Jumper

NOTE: Dell Precision WorkStation 620 systems are equipped with diagnostic LEDs to help provide information about possible problems. Make note of any LED codes you observe before contacting Dell for technical assistance.

If the system cannot boot and you have exhausted all other troubleshooting options, perform the following steps:

1. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from their electrical outlets. Also, disconnect any telephone or telecommunication cables from the computer.

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

2. Remove the computer cover.
3. Remove the AGP card brace according to the instructions in "Removing and Replacing the AGP Card Brace."
4. Install a jumper plug on the RTCRST jumper pins and then remove it.
5. Replace the computer cover, reconnect the system to an electrical outlet, and turn it on.

   If the problem is not resolved, see "Getting Help" for instructions on obtaining technical assistance.

Troubleshooting Drives

NOTE: Before disconnecting a peripheral from the system or removing a component from the system board, verify that the standby power LED on the system board has turned off. For the location of this LED, see Figure 1 in "Installing System Board Options."

If the monitor displays a system error message to indicate a drive problem during execution of either the boot routine or the Dell Diagnostics, or if a drive is not operating correctly, perform the following steps:

1. Enter System Setup, and verify that the problem drive is configured correctly. Make any necessary changes, and reboot the system.
2. If the problem is not resolved, turn off the system, including any attached peripherals, and disconnect all the AC power cables from their electrical outlets. Also, disconnect any telephone or telecommunication cables from the computer.

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

3. Remove the computer cover.
4. Verify that the DC power cables from the power supply are firmly connected to the connectors on each drive. Also verify that the interface cable for each drive is firmly connected to the drive and to the system board.
5. Replace the computer cover, reconnect the system to an electrical outlet, and turn it on. If the problem is not resolved, proceed to step 6.
6. Insert the *Dell Precision ResourceCD* into the CD-ROM drive, reboot the system, and run the appropriate test group in the Dell Diagnostics.

   If the Dell Diagnostics identifies a faulty drive, replace the drive. If the Dell Diagnostics identifies a faulty controller, the system board may be faulty. See "Getting Help" for instructions on obtaining technical assistance.

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Introduction: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- System Features
- Important Note to Microsoft Windows NT 4.0 Users
- Front Panel
- Back Panel
- Getting Help

Overview

Dell Precision 620 systems are high-speed, upgradeable workstations, designed around Intel® Pentium® III Xeon™ microprocessors. These systems support the high-performance Peripheral Component Interconnect (PCI) bus and the accelerated graphics port (AGP) bus. One of the 32-bit PCI slots has a port extension that supports an optional redundant array of independent disks (RAID) card.

NOTE: Dell Precision WorkStation 620 systems do not support the 16-bit Industry-Standard Architecture (ISA) bus.

This section describes the major hardware and software features of the system and provides information you need to reinstall the operating system, if necessary. It also provides information about the indicators and controls on the computer's front panel and discusses connecting external devices to the computer.

System Features

The system offers the following features:

- An Intel Pentium III Xeon microprocessor. The following processor options are available:

  Single or dual Pentium III Xeon processor(s) with a front-side bus external speed of 133 megahertz (MHz).

  The Intel Pentium III Xeon processor includes MMX™ technology designed to handle complex multimedia and communications software. This processor incorporates a new instruction set called Streaming SIMD Extensions (SSE). SSE allows the microprocessor to process multiple data elements in parallel, thereby improving system performance when you are running application programs written to take advantage of MMX technology. The SSE instruction set is made up of more than 70 new instructions and includes floating-point single instruction, multiple data (SIMD) to enhance 3D display performance and other multimedia capabilities.

  The Intel Pentium III Xeon processor also includes the new processor serial number feature, which uniquely identifies each Pentium III processor. This feature can be enabled or disabled (default) (see **CPU Serial Number** in System Setup Options).

  The Intel Pentium III Xeon processor has a 16-kilobyte (KB) internal data cache and a 16-KB internal instruction cache, an internal math coprocessor, and other advanced internal logic.

  NOTE: Dell Precision WorkStation 620 systems support 2.8-volt (V) processor cartridges only.

- A secondary cache of static random-access memory (SRAM) integrated in the microprocessor.
- Dual-processor capability. The system can be purchased with two processors. If your system has one processor, you can install a second Intel Pentium III Xeon processor (operating at the same speed as the installed processor), which you can purchase as a kit from Dell. Dual processing improves performance under operating systems that support multiprocessing, such as Microsoft® Windows NT® 4.0.
- Self-Monitoring Analysis and Reporting Technology (SMART) support, which warns you at system start-up if the hard-disk drive may be becoming unreliable. To take advantage of this technology, you must have a SMART-compliant hard-disk drive in the computer. All enhanced integrated drive electronics (EIDE) and small computer system interface (SCSI) hard-disk drives shipped with Dell Precision 620 systems are SMART-compliant.
- A 32-bit integrated Crystal CS4614 PCI SoundFusion audio controller that is Sound Blaster Pro-compatible and supports Microsoft DirectSound, DirectSound3D, and wavetable synthesis. See "Using the Integrated Audio Controller" for details.
- System memory of up to 2 gigabytes (GB). Your system has dual Rambus dynamic random-access memory (RDRAM) Rambus in-line memory modules (RIMMs). The memory expansion cards (MEC) support up to eight RIMMs (four modules on each of two channels, A and B). MECs support modules in any paired combination of 64-, 128-, 256-, or 512-megabyte (MB) module density. See "Adding Memory" for details on installing additional memory.

  The memory subsystem also provides error checking and correction (ECC) capability, which corrects all single-bit memory errors and detects all double-bit errors.
- The system's basic input/output system (BIOS), which resides in flash memory and can be upgraded remotely or by diskette if required.

*NOTE: If a BIOS upgrade is required, download the flash BIOS file from the file library at **http://support.dell.com**, and run the executable file to create a bootable diskette image that will automatically flash the system BIOS when the system is booted with the diskette.*

- Wake on mouse or keyboard, which, when using Personal System/2 (PS/2) devices, allows you to start the system from the sleep state by pressing a key or moving the mouse.
- Remote Wake Up capability, which, when enabled in the System Setup program, allows you to start the system from a server management console. Remote Wake Up capability also allows remote system setup, BIOS upgrades, software downloading and installation, file updates, and asset tracking after hours and on weekends when local area network (LAN) traffic is at a minimum.
- Universal Serial Bus (USB) capability, which simplifies connection of peripheral devices such as keyboards, printers, and speakers. The USB connectors on the system's back panel provides two connection points for multiple USB-compliant devices. USB-compliant devices can be connected and disconnected while the system is running.

NOTE: Windows NT 4.0 does not support USB devices; however, your Dell Precision WorkStation 620 computer system supports a USB keyboard through its BIOS.

- A modular mini tower computer chassis with a minimum number of screws for easy disassembly and improved serviceability.
- A high-speed, high-resolution AGP 4X or AGP Pro card. (Documentation from the video card manufacturer is included with the system.) AGP Pro (4X) improves graphics performance by providing a dedicated bus for a faster interface between the video subsystem and system memory. AGP also allows conventional memory to be used for video-related tasks.
- An optional LS-120 SuperDisk drive capable of storing up to 120 MB of data per diskette.

The system board includes the following integrated features:

- Four 32-bit PCI expansion slots including one 32-bit PCI/redundant array of independent disks (RAID) expansion slot that has an extension for an optional RAID upgrade.
- Two 64-bit 66-MHz PCI expansion slots.
- One AGP Pro expansion slot.

NOTE: An AGP Pro (4X) graphics adapter expansion card may require the AGP Pro expansion slot and 1 or 2 adjacent PCI slots.

- A diskette drive interface, which supports a 3.5-inch diskette drive.
- Ultra Advanced Technology Attachment (ATA)/66 support, which allows ATA/66 enabled devices to transfer data at speeds of up to 66 MB per second (MB/sec). The two ATA/66 channels support up to four EIDE devices. The primary and secondary EIDE channels support up to two devices each, such as EIDE CD-ROM drives and EIDE tape drives.
- SCSI support using two integrated SCSI channels.
  - The primary channel provides Ultra 160/M low-voltage differential (LVD) (160-MB/sec) support for high-performance SCSI hard-disk drives and an optional RAID subsystem that requires an optional RAID card. This channel also supports Ultra2 and Ultra SCSI devices.
  - The secondary channel provides support for external Ultra/Wide (40-MB/sec) SCSI devices, such as scanners, and for internal narrow SCSI devices, such as CD-ROM drives, tape drives, and optical drives. The maximum total length of the external cable on the secondary channel is .5 m with eight devices or 1 m with four devices.
- Two high-performance serial ports and one bidirectional parallel port for connecting external devices.
- A PS/2-style keyboard port and a PS/2-compatible mouse port.
- An integrated 10/100-megabit-per-second (Mbps) 3Com® PCI 3C920 based and 3C905B-TX compatible Ethernet network interface controller (NIC) with Remote Wake Up support.

The following software is included with your Dell™ computer system:

NOTE: Backup copies of most drivers for your system are included on the Dell Precision ResourceCD. If you need to reinstall any of these drivers, see the documentation that accompanies the CD.

- Utilities that safeguard the system and enhance the operation of its hardware features; for example, the AutoShutdown service lets you perform an orderly shutdown with a single touch of the power button.

NOTE: Windows 2000 does not require the AutoShutdown utility to be loaded.

- Graphics drivers.

NOTE: Some video cards support the Windows NT 4.0 operating system only. Refer to the documentation that came with your video card for more information.

To change the resolution, check the documentation that came with your monitor to determine the resolutions and refresh rates supported by the monitor. Then check the documentation that came with your AGP or PCI video card for instructions on changing the resolution.

- The System Setup program for quickly viewing and changing the system configuration information.
- Enhanced security features available through the System Setup program (a setup password, a system password, a system password lock option, a write-protect option for diskette drives, and automatic display of the system's service tag number). In addition, a customer-definable asset tag number can be assigned via a software support utility and viewed on the System Setup screens. An integrated chassis intrusion detector is also available.
- RAID card drivers for the Microsoft Windows NT 4.0 and Windows 2000 operating systems (with optional RAID card).
- Dell Diagnostics for evaluating the computer's components and devices.
- Network device drivers for several network operating systems. These drivers are described in "Using the Network Interface Controller."
- Desktop Management Interface (DMI) support for managing the computer system. DMI defines the software, interfaces, and data files that enable the system to determine and report information about system components. DMI supports both Windows NT and Windows 2000.

  DMI is optional and can be downloaded from **http://support.dell.com/**. To learn more about DMI, click the **Start** button, point to **Programs**, point to **Dell DMI**, and click **DMI Help**.
- The optional Dell OpenManage™ IT Assistant program, which is a DMI, Simple Network Management Protocol (SNMP), and Common Information Model (CIM) browser that allows the network administrator to view the computer's current hardware configuration, status, and operating system version. Dell OpenManage IT Assistant provides information you may need if you call Dell for technical assistance or if you install hardware or software in the system. For more information, see the *Dell OpenManage IT Assistant User's Guide* at **http://support.dell.com**.
- In addition to providing the client features described in the preceding paragraph, Dell OpenManage IT Assistant enables network administrators to view, manage, and inventory remote systems in a network.
- Advanced Configuration and Power Interface (ACPI) for operating systems that support ACPI functionality.
- Sound drivers.
- SCSI drivers.

Important Note to Microsoft Windows NT 4.0 Users

Your system was configured by Dell to optimize the features of your computer and of the Microsoft Windows NT 4.0 operating system. If you need to reinstall this operating system, you must install several supplemental items to return the system to its full functionality. See the appropriate subsection that follows for your operating system.

Reinstalling Windows NT 4.0

To reinstall the Windows NT 4.0 operating system, you must have the following items:

- The *Dell Precision ResourceCD*
- Windows NT 4.0 CD from Dell
- Windows NT 4.0 SCSI controller driver diskettes
- Windows NT 4.0 Service Pack 4 or later CD

NOTE: The Dell Precision ResourceCD is bootable, and contains a special utility that aids in the reinstallation of Windows NT 4.0 (see "Boot Sequence" for instructions to change the boot sequence for your system, or see the Dell ResourceCD User's Guide).

NOTICE: The integrated SCSI controller and RAID solution are not part of the Windows NT 4.0 operating system. Therefore, when you manually reinstall Windows NT 4.0, you must exit the installation process by pressing <F6> when the system displays the following message:

Setup is inspecting your hardware configuration.

You must then install the SCSI controller drivers as described in "Using the Integrated SCSI Controllers," and then proceed with installing the other supplemental items. If you do not interrupt the installation procedure, the system does not identify the AIC-7899 SCSI controller and locks up.

NOTE: You must install Windows NT 4. 0 Service Pack 4 or 5 before you install the NIC drivers. Otherwise, the integrated NIC will not function properly.

See the *Dell Microsoft Windows NT Workstation 4.0 Setup Guide* for general installation information for Windows NT 4.0 and for information about other drivers or supplements that may be required. For installation instructions for the various drivers, see the documents recommended in the following list:

- Windows NT 4.0 SCSI controller drivers — See the documentation that came with your *Dell Precision ResourceCD*.
- Windows NT 4.0 bus-mastering EIDE driver — See the documentation that came with your *Dell Precision ResourceCD*.
- Windows NT 4.0 video drivers — See the documentation for your video card.
- Windows NT 4.0 NIC driver — See the documentation that came with your *Dell Precision ResourceCD.*
- Windows NT 4.0 audio drivers — See the documentation that came with your *Dell Precision ResourceCD*.

Front Panel

The computer system's front panel contains the following indicators and controls (see Figure 1):

- The *power button* controls the system's DC input power. When the system is turned off, pressing the power button turns the system on. When the system is on, the power button operates as follows:
  - In Windows NT, if the Dell AutoShutdown service is operational, the system performs an orderly operating system shutdown before turning off.

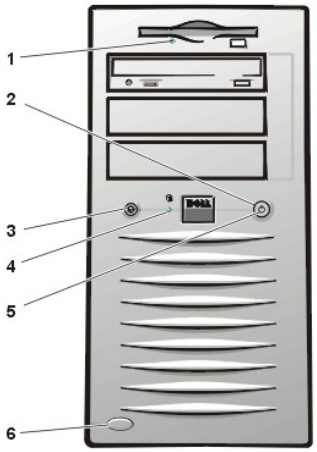
    If the Dell AutoShutdown service is not operational, the system turns off without writing unsaved data to the disk. This could result in loss of data.
  - In Windows 2000, the system performs an orderly operating system shutdown before turning off. However, the power button can be configured to put the computer in a low-power sleep state.

    When the system is on, the power indicator light-emitting diode (LED) displays a solid green. When the system is in a software-induced sleep state, the power indicator displays a blinking green. When you press the power button to turn off the system, the power indicator turns off; however, the power supply maintains a low-voltage (standby) current. To completely remove all power from the system, unplug the DC power cable from its electrical outlet and disconnect the network and telephone cables.

  NOTE: A Display Power Management Signaling (DPMS) monitor does not begin warming up until the computer to which it is attached is turned on. Thus, some DPMS monitors may not display a video image until several seconds after you turn on the computer.
- The *power indicator* LED is green during normal system operation and blinks green when the system is in sleep mode.
- The *hard-disk drive access indicator* lights up when a hard-disk drive is in use.

  NOTE: The power and hard-disk drive access LEDs are also used to display diagnostic codes.
- The *diskette-drive access indicator* lights up when the diskette drive is in use. (The drive access indicator for the tape drive is located on the front of the drive.)
- The *reset button* reboots (restarts) the system without your having to turn the power off and then on again. Rebooting the system in this manner reduces stress on system components.

Figure 1. Mini Tower Chassis Front Panel



1. Diskette-drive access indicator
2. Power button
3. Reset button
4. Hard-disk drive access indicator
5. Power indicator
6. Chassis door latch release button

Back Panel

The computer's back panel contains various ports and connectors for attaching external devices and includes a security cable slot. These features are described in the following subsections.

The back panel also contains diagnostic LEDs that provide diagnostic codes for resolving problems that may occur during the computer system's power-on self-test (POST).

For information about enabling, disabling, or configuring input/output (I/O) ports and connectors, see "Using System Setup." For detailed descriptions and illustrations of each port and connector on the back panel, see "I/O Ports and Connectors."

Connecting External Devices

You can connect various external devices, such as a mouse and printer, to the I/O ports and connectors on the computer's back panel. The system BIOS detects the presence of most external devices when you boot or reboot the system. When connecting external devices to the computer, follow these guidelines:

- Check the documentation that came with the device for specific installation and configuration instructions.

  For example, most devices must be connected to a particular I/O port or connector to operate properly. Also, external devices like a mouse or printer usually require you to load software files called *device drivers* into system memory before they will work. These software drivers help the computer recognize the external device and direct its operation.

- Dell recommends that you attach external devices *only while the computer is turned off* unless you are instructed otherwise in the documentation for the particular device. Then turn the computer on before turning on any external devices unless the documentation for the device specifies otherwise. (If the computer does not seem to recognize the device, try turning on the device before turning on the computer.)

NOTICE: When you disconnect external devices from the back of the computer, wait 10 to 20 seconds after disconnecting the computer from the electrical outlet before you disconnect the device to avoid possible damage to the system board.

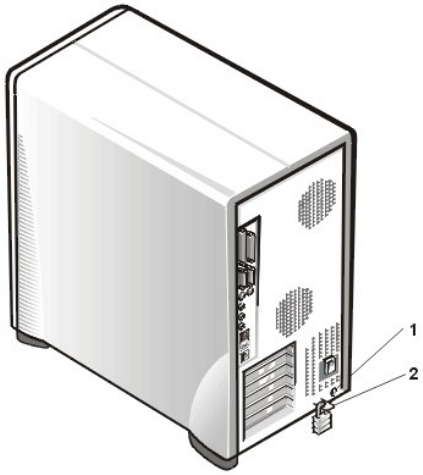
Security Cable Slot and Padlock Ring

On the back of the computer are a security cable slot and padlock ring (see Figure 2) for attaching commercially available antitheft devices. Security cables for personal computers usually include a segment of galvanized cable with an attached locking device and key. To prevent unauthorized removal of the computer, loop the cable around an immovable object, ensure that the padlock ring is in its closed position, insert the locking device into the security cable slot on the back of the computer, and lock the device with the key provided. Complete instructions for installing this kind of antitheft device are usually included with the device.

NOTE: Antitheft devices are of differing designs. Before you purchase such a device, make sure it will work with the cable slot on the computer.

The padlock ring allows you to secure the computer cover to the chassis to prevent unauthorized access to the inside of the computer. To use the padlock ring, slide the padlock ring to its closed position and insert a commercially available padlock through the ring and then lock the padlock.

Figure 2. Security Cable Slot and Padlock Ring



1 Security cable slot

2 Padlock ring

Getting Help

If at any time you do not understand a procedure described in this guide or if the system does not perform as expected, Dell provides a number of tools to help you. For more information on these help tools, see "Getting Help."

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Messages and Codes: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- System Messages
- System Beep Codes
- Warning Messages
- Diagnostics Messages
- Diagnostic LEDs
- SNMP Platform Event Traps

Overview

Your application programs, operating system, and the computer itself are capable of identifying problems and alerting you to them. When a problem occurs, a message may appear on your monitor screen or a beep code may sound. See "System Messages" or "System Beep Codes" for information about each message or beep code.

System Messages

If you receive a system message, see Table 1 for suggestions on resolving any problems indicated by the message. The system messages are listed alphabetically.

NOTE: If the system message you received is not listed in the table, check the documentation for the application program that you were running at the time the message appeared and/or the operating system documentation for an explanation of the message and a recommended action.

Table 1. System Messages

Message	Cause	Action
`Address mark not found`	The BIOS found a faulty disk sector or could not find a particular disk sector.	See "Troubleshooting Drives."
`Alert! Card-cage fan not detected.`	Expansion card cage fan not installed in mini tower chassis; expansion card cage fan has failed; expansion card cage fan is not connected to the system board.	Ensure that an operational expansion card cage fan is installed and connected to the system board.
`Alert! Cover was previously removed.`	The computer cover was removed.	Reset **Chassis Intrusion** in System Setup.
`Alert! Hard drive thermal probe not detected.`	No hard-disk drive thermal probe is installed; system has a defective thermal probe; thermal probe cable is not connected to the control panel.	Ensure that an operational hard-disk drive thermal probe is installed and connected to the control panel.
`Alert! Power supply fan failure.`	Power supply fan has failed or is blocked.	Ensure an operational power supply fan is installed and that chassis ventilation slots are not blocked.
`Alert! Previous card-cage fan failure.`	Expansion card cage fan has failed or is blocked.	Ensure an operational expansion card cage fan is installed, connected to the system board, and that chassis ventilation slots are not blocked.
`Alert! Previous hard drive temperature failure.`	Hard-disk drive(s) exceeded recommended operating temperature range during the previous operating session.	Ensure fans are operational and that chassis ventilation slots are not blocked.
`Alert! Previous power supply fan failure.`	Power supply fan failed or was blocked during the previous operating session.	Ensure an operational power supply fan is installed and that chassis ventilation slots are not blocked.
`Alert! Previous shutdown due to thermal event.`	Microprocessor(s) or hard-disk drive(s) exceeded recommended operating temperature range during the previous operating session. System was shut down to protect the components.	Ensure fans are operational and that chassis ventilation slots are not blocked.
`Alert! Previous system fan failure.`	System fan failed or was blocked during the previous operating session.	Ensure an operational system fan is installed, connected to the system board, and that chassis ventilation slots are not blocked.
`Alert! Previous temperature failure at Processor 0.`	Primary processor exceeded its recommended operating temperature range during the previous operating session.	Ensure an operational processor fan is installed, connected to the system board, and that chassis ventilation slots are not blocked.

`Alert! Previous temperature failure at Processor 1.`	Secondary processor exceeded its recommended operating temperature range during the previous operating session.	Ensure an operational processor fan is installed, connected to the system board, and that chassis ventilation slots are not blocked.
`Alert! Previous voltage failure.`	System voltage exceeded or fell below acceptable thresholds.	See "Troubleshooting the System Board."
`Alert! Processor 0 failed Build-In Self Test(BIST).`	Primary processor is faulty or improperly seated.	Reseat the processor, or replace a faulty processor.
`Alert! Processor 1 failed Build-In Self Test(BIST).`	Secondary processor is faulty or improperly seated.	Reseat the processor, or replace a faulty processor.
`Alert! Processor Cache Size Mismatch.`	Two processors with different L2 cache sizes are installed.	Replace one of the processors so that the L2 cache sizes match, or install a termination card in PROC_1 slot on system board.
`Alert! Processor Speed Mismatch. Install like processors or one processor and a termination card.`	Two processors that are not of the same speed are installed.	Replace one of the processors so that the speeds match, or install a termination card in PROC_1 slot on system board.
`Alert! Processor Type Mismatch. Install like processors or one processor and a termination card.`	Two processors that are not of the same type are installed.	Replace one of the processors so that the types match, or install a termination card in PROC_1 slot on system board.
`Alert! Single-bit memory error previously detected in XXXXh.`	Faulty or improperly seated RIMMs or defective system board.	See "Troubleshooting System Memory" and "Troubleshooting the System Board."
`Alert! System battery voltage is low.`	System battery is providing inadequate voltage.	See "Troubleshooting the Battery."
`Alert! System fan not detected.`	No system fan is installed; system fan has failed; system fan is not connected to the system board.	Ensure an operational system fan is installed and connected to the system board.
`Alert! Uncorrectable memory error previously detected in XXXXh.`	Faulty or improperly seated RIMMs or defective system board.	See "Troubleshooting System Memory" and "Troubleshooting the System Board."
`Attachment failed to respond`	The diskette drive or hard-disk drive controller cannot send data to the associated drive.	See "Troubleshooting Drives."
`Bad command or file name`	The command you entered does not exist or is not in the pathname you specified.	Make sure you have spelled the command correctly, placed spaces in the proper location, and used the correct pathname.
`Bad error-correction code(ECC) on disk read`	The diskette drive or hard-disk drive controller detected an uncorrectable read error.	See "Troubleshooting Drives."
`Controller has failed`	The hard-disk drive or the associated controller is defective.	See "Troubleshooting Drives."
`Data error`	The diskette or hard-disk drive cannot read the data.	Run the ScanDisk utility in Microsoft® Windows® to check the file structure of the diskette or hard-disk drive. See your operating system documentation for more information. If you are using another operating system, run the appropriate utility to check the file structure of the diskette or hard-disk drive. See your operating system documentation.
`Decreasing available memory`	One or more RIMMs may be faulty or improperly seated.	See "Troubleshooting System Memory."

`Diskette drive 0 seek failure`
 	
`Diskette drive 1 seek failure`
	A cable may be loose, or the system configuration information may not match the hardware configuration.	See "Troubleshooting Drives."

`Diskette read`	A cable may be loose, or the diskette may be faulty.	See "Troubleshooting Drives."

failure		
Diskette subsystem reset failed	The diskette drive controller may be faulty.	Run the **Diskette** tests in the Dell Diagnostics.
Drive not ready	No diskette is in the drive. The operation requires a diskette in the drive before it can continue.	Put a diskette in the drive or close the drive latch.
Diskette write protected	The diskette write-protect feature is activated.	Remove the diskette from drive A and move the write-protect tab to the unlocked position.
Gate A20 failure	One or more RIMMs may be loose.	See "Troubleshooting System Memory."
General failure	The operating system is unable to carry out the command.	This message is usually followed by specific information—for example, PRINTER OUT OF PAPER. Respond by taking the appropriate action.
Hard disk configuration error	The hard-disk drive failed initialization.	See "Troubleshooting Drives."
Hard disk controller failure Hard disk failure Hard-disk drive read failure	The hard-disk drive failed initialization.	See "Troubleshooting Drives."
Invalid configuration information - please run SETUP program	The system configuration information does not match the hardware configuration.	Enter System Setup and correct the system configuration information.
Keyboard clock line failure Keyboard controller failure Keyboard data line failure Keyboard failure Keyboard stuck key failure	A cable or connector may be loose, or the keyboard or keyboard/mouse controller may be faulty.	See "Troubleshooting the Keyboard."
Memory address line failure at *address*, read *value* expecting *value*	One or more RIMMs may be faulty or improperly seated.	See "Troubleshooting System Memory."
Memory allocation error	The software you are attempting to run is conflicting with the operating system or another application program or utility.	Turn off the computer, wait 30 seconds,and then turn it on. Try to run the program again. If the problem persists, contact the software company.
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*	One or more RIMMs may be faulty or improperly seated.	See "Troubleshooting System Memory."
Memory size in CMOS invalid	The amount of memory recorded in the system configuration information does not match the memory installed in the computer.	Reboot the computer. If the error appears again, see "Getting Help" for instructions on obtaining technical assistance.
Memory tests	The memory test did not complete.	Rerun the memory test.

terminated by keystroke		
No boot device available	The computer cannot find the diskette or hard-disk drive.	Enter System Setup, check the system configuration information for the diskette and hard-disk drive, and if necessary, correct the information.
No boot sector on hard-disk drive	The system configuration information in System Setup may be incorrect, or the operating system may be corrupted.	Enter System Setup, check the system configuration information for the hard-disk drive, and if necessary, correct the information. If the message persists, reinstall your operating system. See the documentation that came with your operating system.
No timer tick interrupt	A chip on the system board might be malfunctioning.	Run the **System Board Devices** tests in the Dell Diagnostics.
Non-system disk or disk error	The diskette in drive A or your hard-disk drive does not have a bootable operating system installed on it.	Either replace the diskette with one that has a bootable operating system, or remove the diskette from drive A and restart the computer.
Not a boot diskette	There is no operating system on the diskette.	Boot the computer with a diskette that contains an operating system.
Plug and Play Configuration Error	The system has encountered a problem in trying to configure one or more expansion cards.	Turn your system off and unplug it. Remove all but one of the cards. Plug in your system and reboot it. If the message persists, the expansion card may be malfunctioning. If the message does not appear, turn off the power and reinsert one of the other cards. Repeat this process until you identify the malfunctioning card.
Read fault	The operating system cannot read from the diskette or hard-disk drive.	See "Troubleshooting Drives."
Requested sector not found	The system could not find a particular sector on the disk, or the requested sector is defective.	See "Troubleshooting Drives."
Reset failed	The disk reset operation failed.	See "Troubleshooting Drives."
Sector not found	The operating system is unable to locate a sector on the diskette or hard-disk drive.	See "Troubleshooting Drives."
Seek error	The operating system is unable to find a specific track on the diskette or hard-disk drive.	If the error is on the diskette drive, try another diskette in the drive.
Shutdown failure	A chip on the system board might be malfunctioning.	Run the **System Board Devices** tests in the Dell Diagnostics.
Time-of-day clock stopped	The battery may be dead.	Enter System Setup and correct the date or time. If the problem persists, see "Troubleshooting the Battery."
Time-of-day not set	The time or date displayed in the system configuration information does not match the system clock.	Enter System Setup and correct the date or time.
Timer chip counter 2 failed	A chip on the system board might be malfunctioning.	Run the **System Board Devices** tests in the Dell Diagnostics.
Unexpected interrupt in protected mode	The keyboard controller may be malfunctioning, or one or more RIMMs may be loose.	Run the **System Memory** and the **Keyboard** tests in the Dell Diagnostics.
WARNING:Dell's Disk Monitoring System has detected that drive [0/1] on the [primary/secondary] 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 has queried the EIDE drive for status information. The drive has returned a parameter from the call that indicates it has detected possible error conditions for its operating specifications.	When your computer finishes booting, immediately back up your data and replace your hard-disk drive. Restore the data to the replaced drive. If a replacement drive is not immediately available and the drive is not the only bootable drive, enter System Setup and change the appropriate drive setting to None. Remove the drive from the system. This should be done only after you have backed up the data.
Write fault	The operating system cannot write to the diskette or	See "Troubleshooting Drives."

`Write fault on selected drive`	hard-disk drive.	

NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.

System Beep Codes

When errors occur during a boot routine that cannot be reported on the monitor, your computer may emit a series of beeps that identify the problem. The beep code is a pattern of sounds: for example, one beep, followed by a second beep, and then a burst of three beeps (code 1-1-3) means that the computer was unable to read the data in nonvolatile random-access memory (NVRAM). This information is invaluable to the Dell support staff if you need to call for technical assistance.

When a beep code is emitted, write it down on a copy of the Diagnostics Checklist and then look it up in Table 2. If you are unable to resolve the problem by looking up the meaning of the beep code, use the Dell Diagnostics to identify a more serious cause. If you are still unable to resolve the problem, see "Getting Help" for instructions on obtaining technical assistance.

Table 2. System Beep Codes

Code	Cause	Action
1-1-2	Microprocessor register failure	See "Getting Help" for instructions on obtaining technical assistance.
1-1-3	NVRAM	Run the **System Board Devices** tests in the Dell Diagnostics.
1-1-4	ROM BIOS checksum failure	Run the **System Board Devices** tests in the Dell Diagnostics, if possible.
1-2-1	Programmable interval timer	Run the **System Board Devices** tests in the Dell Diagnostics, if possible.
1-2-2	DMA initialization failure	Run the **System Board Devices** tests in the Dell Diagnostics, if possible.
1-2-3	DMA page register read/write failure	Run the **System Board Devices** tests in the Dell Diagnostics, if possible.
1-3	Video Memory Test failure	Run the **VESA/VGA Interface** tests in the Dell Diagnostics.
1-3-1	RIMMs not being properly identified or used	See "Troubleshooting System Memory."
1-3-2	No RIMM detected	Install RIMM pair or reseat RIMMs.
1-3-3 through 2-4-4	RIMMs not being properly identified or used	See "Troubleshooting System Memory."
3-1-1	Slave DMA register failure	Run the **System Board Devices** tests in the Dell Diagnostics, if possible.
3-1-2	Master DMA register failure	Run the **System Board Devices** tests in the Dell Diagnostics, if possible.
3-1-3	Master interrupt mask register failure	See "Getting Help" for instructions on obtaining technical assistance.
3-1-4	Slave interrupt mask register failure	See "Getting Help" for instructions on obtaining technical assistance.
3-2-2	Interrupt vector loading failure	See "Getting Help" for instructions on obtaining technical assistance.
3-2-4	Keyboard Controller Test failure	Run the **Keyboard** tests in the Dell Diagnostics. Otherwise, see "Getting Help" for instructions on obtaining technical assistance.
3-3-1	NVRAM power loss	Run the **System Board Devices** tests in the Dell Diagnostics, if possible.
3-3-2	NVRAM configuration	Run the **System Board Devices** tests in the Dell Diagnostics, if possible.
3-3-4	Video Memory Test failure	Run the **VESA/VGA Interface** tests in the Dell Diagnostics.
3-4-1	Screen initialization failure	Run the **VESA/VGA Interface** tests in the Dell Diagnostics.
3-4-2	Screen retrace failure	Run the **VESA/VGA Interface** tests in the Dell Diagnostics.
3-4-3	Search for video ROM failure	Run the **VESA/VGA Interface** tests in the Dell Diagnostics.
4-2-1	No time tick	See "Getting Help" for instructions on obtaining technical assistance.
4-2-2	Shutdown failure	See "Getting Help" for instructions on obtaining technical assistance.
4-2-3	Gate A20 failure	See "Getting Help" for instructions on obtaining technical assistance.
4-2-4	Unexpected interrupt in protected mode	See "Getting Help" for instructions on obtaining technical assistance.
4-3-1	Memory failure above address 0FFFFh	Run the **System Memory** tests in the Dell Diagnostics.
4-3-3	Timer-chip counter 2 failure	See "Getting Help" for instructions on obtaining technical assistance.
4-3-4	Time-of-day clock stopped	See "Getting Help" for instructions on obtaining technical assistance.
4-4-1	Serial or parallel port test failure	Run the **Serial Ports** and the **Parallel Ports** tests in the Dell Diagnostics.
4-4-2	Failure to decompress code to shadowed memory.	Run the **System Board Devices** tests in the Dell Diagnostics.

4-4-3	Math-coprocessor test failure	Run the **System Board Devices** tests in the Dell Diagnostics.
4-4-4	Cache test failure	Run the **System Board Devices** tests in the Dell Diagnostics.
5-2-2-1	Mismatch RDRAM device count; unsupported RIMM device count or technology	Replace RIMM pair with supported matching device count.
5-2-2-2	Mismatch RDRAM technology or timing pair; unsupported RIMM timing	Replace RIMM pair with matching technology and timing.
5-2-2-3	RDRAM levelization failure	Reseat RIMMs and C-RIMMs or replace faulty or unsupported RIMMs.
NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.		

Warning Messages

A warning message alerts you to a possible problem and asks you to do something before execution continues. For example, before you format a diskette, a message may warn you that you may lose all data on the diskette as a way to protect against inadvertently erasing or writing over the data. These warning messages usually interrupt the procedure and require you to respond by typing a `y (yes)` or `n (no)`.

NOTE: Warning messages are generated by either your application programs or your operating system. See "Software Checks" and the documentation that came with your operating system and application programs.

Diagnostics Messages

When you run a test group or subtest 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 your Diagnostics Checklist. Also see "Getting Help" for instructions on obtaining technical assistance.

Diagnostic LEDs

Light-emitting diodes (LEDs) are located on the front panel and back panel of the chassis. These LEDs emit diagnostic codes that can help you troubleshoot a system problem. The following sections describe the meaning of the diagnostic codes.

CAUTION: Before servicing any components inside your computer, see "Safety First—For You and Your Computer."

Front Panel LEDs

Table 3 lists the codes for the front panel diagnostic LEDs, probable causes, and suggested corrective actions.

Table 3. Front Panel Diagnostic LED Codes

Power LED Code	Hard-Disk Drive LED Code	Cause	Action
Blinking yellow	Off	System power supply failed.	See "Getting Help" for instructions on obtaining technical assistance.
Blinking yellow	Solid green	Voltage regulator failure on the system board.	See "Getting Help" for instructions on obtaining technical assistance.
Solid yellow	N/A	A device on the system board may be faulty or is incorrectly installed.	Be sure that each processor is properly seated, remove all expansion cards, and then reboot. If the system does not boot, see "Getting Help" for instructions on obtaining technical assistance.
Solid green and a beep code during POST	N/A	A problem was detected while the BIOS was executing.	See Table 2 for instructions on diagnosing the beep code.
Solid green power indicator and no beep code and no video during POST	N/A	The monitor or the graphics card may be faulty.	See "Troubleshooting the Monitor." If the monitor is operating properly and is correctly connected, see "Getting Help" for instructions on obtaining technical assistance.
Solid green power indicator and no beep code, but the system locks up during POST	N/A	An integrated system board device may be faulty.	See "Getting Help" for instructions on obtaining technical assistance.
NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.			

Back Panel LEDs

When you turn on your system, it performs a power-on self-test (POST), which is a series of self-diagnostic checks. A successful POST ends with a single beep that signifies the start of normal operation. If the system fails to emit the single beep or appears to stop responding during POST, a series of LEDs located at the rear of the computer can help you understand which POST test failed or why the system stopped responding. These LEDs indicate problems encountered during POST only, not during normal operation.

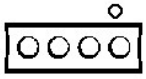
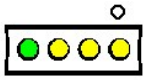
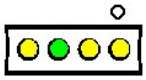
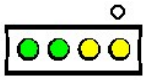
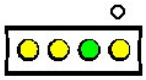
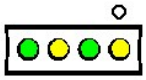
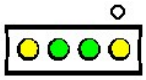
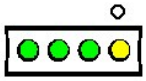
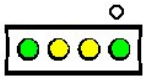
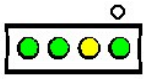
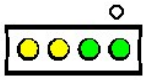
CAUTION: Before servicing any components inside your computer, see "Safety First—For You and Your Computer."

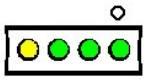
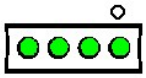
The LED patterns described in Table 4 can help you determine what to do to resolve the problem. If a problem resolution requires you to open the computer chassis, refer to "Working Inside Your Computer" for procedures you need to complete prior to performing the suggested resolution. If the problem persists after you perform the suggested problem resolution(s), contact Dell Technical Support for further help.

Table 4 lists the codes for the back panel diagnostic LEDs, probable causes, and suggested corrective actions. The LED patterns are shown as they appear on the back of your mini tower chassis. Use this circle to match the LED pattern your computer is displaying with one of the patterns shown in Table 4.

Table 4. Back Panel Diagnostic LED Codes

Key: **LED OFF** **LED Yellow** **LED Green**

State	LED pattern	Problem Description	Suggested Resolution
S0		Normal off condition or possible pre-BIOS failure	Re-flash BIOS, and restart the system to retest.
S1		Possible BIOS failure and the system is in the recovery mode	Insert the BIOS recovery diskette, wait for recovery completion, and restart the system to retest.
S2		Possible processor failure	Reseat the processor(s) and the terminator card (if present), and restart the system to retest.
S3		Possible memory failure	Reseat all RIMMs, any C-RIMMs, and both MECs, and restart the system to retest.
S4		Possible expansion card failure	Remove each expansion card individually, and restart the system to retest. Reinstall the expansion card(s) one at a time, and restart the system to retest. Move each expansion card one at a time to another PCI slot, and restart the system to retest.
S5		Possible video card failure	Reseat the video card, and restart the system to retest.
S6		Possible diskette or hard-disk drive failure	Reseat all power and data cables, and restart the system to retest.
S7		Possible USB failure	Reseat all USB devices and cables, and restart the system to retest.
S9		Possible system board failure	Remove any internal options recently added, and restart the system to retest.
S11		Possible system board resource conflict	Remove any internal options recently added, and restart the system to retest.
S12		Possible system board resource conflict	Remove any internal options recently added, and restart the system to retest.

S14		Possible system board resource conflict	Remove any internal options recently added, and restart the system to retest
S15		Normal operating condition after POST	None.

System Board LEDs

The system board contains a number of LEDs that tell you the state of the CPUs, memory, and logic circuitry.

CAUTION: Before servicing any components inside your computer, see "Safety First—For You and Your Computer."

Table 5 lists the descriptions for the system board LEDs.

Table 5. Back Panel Diagnostic LED Codes

LED	Description
CPU_MISMATCH	Processors do not match in type or speed and may not operate properly.
MEC_MISMATCH	RIMM pairs on the two MECs are missing or are not matched pairs.
Suspend to RAM (STR_LED)	System is in a sleep state.
POWER_LED	Power exists on the system board; do not service until the LED goes out.
STANDBY_LED	System is in standby state.
Hard-disk drive (HD_LED)	Hard-disk drive is active.

SNMP Platform Event Traps

Your system can generate several Simple Network Management Protocol (SNMP) platform event trap (PET) messages that are sent to network management software to inform the network manager that specific events have occurred on your system.

Table 6 lists the SNMP platform event traps you system may create.

Table 6. SNMP Platform Event Trap

Description	Code
BIOS boot failure	02 03 23 6f 00
Fan failure	02 03 04 06 01
Chassis intrusion	02 03 05 6f 00
Temperature failure	02 03 01 06 01
Invalid password	02 03 06 6f 01
Voltage failure	02 03 02 06 01
SOS enable / PC presence	02 03 25 6f 00

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Using the Network Interface Controller: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- Connecting to a Network
- Configuring the NIC
- Reinstalling the NIC Drivers

Overview

This section describes how to connect your computer system to an Ethernet network using the integrated 3Com® Peripheral Component Interconnect (PCI) (3C920 based and 3C905-TX compatible) network interface controller (NIC). The NIC provides all the functions normally provided by a separate network expansion card.

The integrated NIC includes a Remote Wake Up feature that enables the computer to be started up by a special local area network (LAN) signal from a server management console. Remote Wake Up capability allows remote computer setup, basic input/output system (BIOS) upgrades, software downloading and installation, file updates, and asset tracking after hours and on weekends when LAN traffic is typically at a minimum.

NOTES: The Remote Wake Up feature functions even when the computer is turned off; however, the computer must be plugged into a working electrical outlet at all times and must be shut down in the normal method expected by the operating system. Thus, if you disconnect the system power cable from the electrical outlet, if a power failure occurs, or if you shut down the system abnormally, the Remote Wake Up feature will not work.

*The link-integrity and activity indicators on the NIC connector (see Figure 1) remain active whenever the computer is plugged in, whether or not the computer is turned off, and whether or not the **Network Interface Controller** and **Remote Wake Up** options are enabled in the System Setup program.*

*When **Remote Wake Up** is enabled in the System Setup program, the green link-integrity indicator on the NIC connector (see Figure 1) remains on when the computer is turned off.*

The integrated NIC provides a method for the system management BIOS to send platform event traps to the network management system when the operating system and Dell OpenManage™ Client Instrumentation are not available. For example, if the system is in a sleep state and someone opens the chassis, the BIOS can send a chassis intrusion event to the network management system.

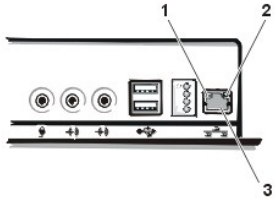
This section also provides instructions for configuring the NIC under Microsoft® Windows NT® 4.0.

NOTE: The NIC drivers for systems running a Dell-installed Windows® 2000 operating system are automatically detected and installed.

The NIC connector on the computer's back panel (see Figure 1) has the following indicators:

- A *link-integrity indicator*, which lights up when there is a good connection between the network and the NIC. The indicator shows a green light when connected to a 10-megabits-per-second (Mbps) network and an orange light when connected to a 100-Mbps network. When the indicator is off, the computer system is not detecting a physical connection to the network or the power source to the computer has been shut off.
- A yellow *activity indicator*, which flashes when the system is transmitting or receiving network data. A high volume of network traffic may make this indicator appear to be in a steady "on" state.v

Figure 1. NIC Connector and Indicators



1 Link-integrity indicator

2 Activity indicator

3 NIC connector

Connecting to a Network

To connect your system to and configure it for use on an Ethernet network, perform the following steps:

1. Connect the network cable to the back of your computer.

2. Verify that the NIC is enabled in the System Setup program.
3. Configure the NIC and install the network driver.
4. Run the **Network Interface Test Group** in the Dell Diagnostics to verify that the NIC is operating properly.

   See "Starting the Dell Diagnostics" for detailed instructions.

Network Cable Requirements

The network adapter connector attaches an unshielded twisted pair (UTP) Ethernet cable to your computer. Press one end of the UTP cable to an RJ45 jack wall plate or to an RJ45 port on a UTP concentrator or hub, depending on your network configuration, and press the other end of the UTP cable into the network adapter connector until the cable snaps securely into place.

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

- Dell recommends the use of Category 5 wiring and connectors for our customers' networks.
- Voice and data lines should be in separate sheaths.
- The maximum cable run length (from a workstation to a concentrator) is 100 meters (m) (328 feet [ft]).
- The maximum number of workstations (not counting concentrators) on a network is 1024.
- The maximum number of daisy-chained concentrators on one network segment is four.

Setting the Network Frame Type

This section describes how to set the network frame type for an Internetwork Packet eXchange/Sequenced Packet eXchange (IPX/SPX)-compatible network protocol.

*NOTE: The default frame type **Auto** is optimal for most installations. For more information concerning frame types, contact your network administrator or Internet Service Provider (ISP).*

If your system is connected to a network, set the network frame type by performing the following steps:

1. Right-click the **Network Neighborhood** icon on the Windows NT desktop, and click **Properties** in the pop-up menu.
2. In the **Network** window, click the **Configuration** tab, and then click **IPX/SPX-compatible Protocol**.
3. Click **Properties**.
4. In the **IPX/SPX-compatible Protocol Properties** window, click the **Advanced** tab, and then select **Frame Type** from the **Property** list.
5. Select the appropriate frame type (according to your network requirements) from the **Value** menu, and click **OK**.
6. Follow the instructions on your screen to complete the configuration.

Configuring the NIC

This section provides instructions for configuring the computer's integrated 10/100-Mbps 3Com NIC under the Microsoft Windows NT 4.0 operating system.

NOTE: If you reinstall Windows NT 4.0, you must install Service Pack 4 or later and the bus-mastering enhanced integrated drive electronics (EIDE) device driver before you can install the NIC driver.

The Windows 2000 operating system automatically detects, installs, and configures the NIC driver.

Reinstalling the NIC Driver

For information on how to reinstall the NIC driver for Windows NT 4.0, see the documentation that came with your *Dell Precision ResourceCD*.

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Temporary file. Delete before release.

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Basic Checks: Dell Precision WorkStation 620 Systems User's Guide
Installing System Board Options: Dell Precision WorkStation 620 Systems User's Guide
Contacting Dell: Dell [document title]
Diagnostics: Dell Precision WorkStation 620 System User's Guide
Installing Drives: Dell Precision WorkStation 620 Systems User's Guide
External Components: Dell Precision WorkStation 620 Systems User's Guide
Getting Help: Dell Precision WorkStation 620 Systems User's Guide
Glossary: Dell Precision WorkStation 620 Systems User's Guide
Hardware Configuration Features: Dell Precision WorkStation 620 Systems User's Guide
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Using the Integrated SCSI Controllers: Dell Precision™ WorkStation 620 Systems User's Guide

- Overview
- SCSI Device Considerations
- Installing SCSI Drivers

Overview

This section provides information about the integrated dual-channel Adaptec 7899 Ultra160/M low-voltage differential (LVD) small computer system interface (SCSI) controller. This controller provides transfer rates of up to 160 megabytes per second (MB/sec) with LVD hard-disk drives on the primary channel, and up to 40 MB/sec with non-LVD hard-disk drives on the secondary channel. Your computer system supports up to four hard-disk drives.

NOTES: To achieve 160-MB/sec data transfer rates on the primary SCSI channel, you must use LVD hard-disk drives and either an LVD terminator or a multimode terminator.

If you install a mix of LVD and non-LVD hard-disk drives, the system can only achieve 40-MB/sec data transfer rates for all SCSI drives. In addition, the LVD drives in this mix must be capable of reverting to 40 MB/sec. In this configuration, you can terminate the SCSI subsystem with either a single-ended or multimode terminator.

Dell ships multimode terminators only, regardless of system configuration.

The maximum total length of the SCSI cable for the primary SCSI channel is 12 meters (m). The maximum total length of the SCSI cable for the secondary SCSI channel is .5 m with eight devices or 1 m with four devices.

The total number of SCSI devices connected to the secondary 7899 controller, both internally and externally, cannot exceed 15.

SCSI Device Considerations

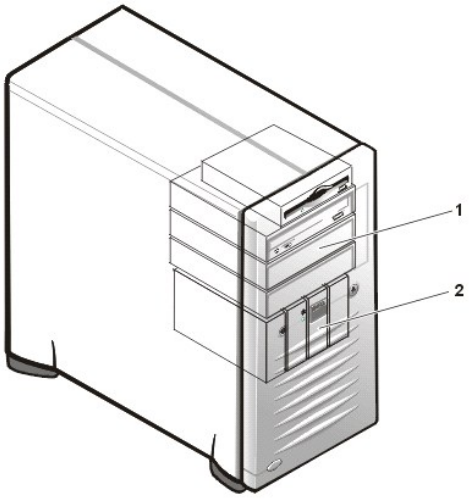
The 5.25-inch externally accessible drive bays at the front of the computer are normally used for non–hard-disk drive devices such as CD-ROM drives or tape drives. These can be enhanced integrated drive electronics (EIDE) or SCSI devices.

NOTICE: Your hard-disk drive subsystem must consist of either SCSI hard-disk drives or EIDE hard-disk drives. Dell does not support a mix of both types of hard-disk drives.

NOTE: Dell supports only the drives it furnishes.

Four internal drive bays (located in the drive cage beneath the externally accessible drive bays; see Figure 1) are used for either SCSI hard-disk drives or EIDE hard-disk drives. Internal hard-disk drives are mounted vertically in a removable drive bracket that can contain up to four 1-inch hard-disk drives, up to three 1.6-inch hard-disk drives, or up to two 1-inch and two 1.6-inch hard-disk drives.

Figure 1. Internal Drive Bays



1 External drive bays

2 Four-bay hard-disk drive cage (internal)

For detailed information about installing drives in either the externally accessible drive bays or the internal drive bays, see "Installing Drives."

Installing SCSI Drivers

Dell installed the SCSI drivers for your system on your system's hard-disk drive. Backup copies of these drivers are provided on the *Dell Precision ResourceCD*. If your system's SCSI drivers are ever inadvertently erased or corrupted, you must reinstall them. For instructions on reinstalling these drivers, refer to the documentation that came with your *Dell Precision Resource CD*.

NOTE: SCSI Drivers for the Linux operating system are included with the Linux operating system and distribution media. They are not provided on the Dell Precision ResourceCD.

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System Setup Options: Dell Precision™ WorkStation 620 Systems User's Guide

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AC Power Recovery

AC Power Recovery determines what happens when you restore AC power to the system. When you select **Off**, the system remains off when AC power is restored. When you select **On**, the system starts up when AC power is restored. When you select **Last** (the default), the system returns to the power state (on or off) that it was in when AC power was removed.

Asset Tag

Asset Tag displays the customer-programmable asset tag number for the system if an asset tag number is assigned. You can use the Asset Tag utility, which is included with your software support utilities, to enter an asset tag number up to ten characters long into nonvolatile random-access memory (NVRAM).

Auto Power On

Auto Power On allows you to set the time and days of the week to turn on the computer system automatically. You can set **Auto Power On** to turn on the system either every day or every Monday through Friday.

NOTE: This feature does not work if you turn off your system using a power strip or surge protector.

Time is kept in a 24-hour format (*hours:minutes*). To change the start-up time, press the right-arrow key to increase the number in the highlighted field or press the left-arrow key to decrease the number. If you prefer, you can type numbers in both fields.

The default for **Auto Power On** is **Disabled**.

Boot Sequence

Boot Sequence enables you to set the order of the devices from which the system attempts to boot.

The term *boot* refers to the system's start-up procedure. When turned on, the system "bootstraps" itself into an operational state by loading into memory a small program, which in turn loads the necessary operating system. **Boot Sequence** tells the system where to look for the files that it needs to load.

To set the boot device order, press <Enter> to access the field's pop-up options menu. Press the up- and down-arrow keys to move through the list of devices. Press the spacebar to enable or disable a device (enabled devices appear with a check mark). Press plus (+) or minus (–) to move a selected device up or down the list. The following subsections describe typical boot devices.

Diskette Drive

Selecting **Diskette Drive** as the first device causes the system to try booting from drive A first. If the system finds a diskette that is not bootable in the drive or finds a problem with the drive itself, it displays an error message. If it does not find a diskette in the drive, the system tries to boot from

the next device in the boot sequence list.

Hard-Disk Drive

Selecting **Hard-Disk Drive** causes the system to attempt to boot first from the hard-disk drive and then from the next device in the boot sequence list.

IDE CD-ROM Device

Selecting **IDE CD-ROM Device** causes the system to try booting from the IDE CD-ROM drive first. If it does not find a CD in the drive, the system tries to boot from the next device in the boot sequence list.

AIC-7899 SCSI CD-ROM Drive

Selecting **AIC-7899 SCSI CD-ROM Drive** causes the system to try booting from the SCSI CD-ROM drive first. If it does not find a CD in the drive, the system tries to boot from the next device in the boot sequence list.

MBA

Selecting **MBA** causes the system to prompt you to press <Ctrl><Alt><b> at the Dell logo screen during boot. A menu then appears that allows you to select **PXE**, **RPL**, **BootP**, or **NetWare** as the active boot mode. If a boot routine is not available from the network server, the system tries to boot from the next device in the boot sequence list.

CPU Information

CPU Information opens a window that allows you to configure or view the following properties of the installed microprocessor(s):

CPU Speed allows you to configure the internal clock speed of the installed processor(s). Set this option to **Normal** for the rated speed, or to **Compatible** for a slower compatibility speed.

Bus Speed displays the front-side bus external speed of the installed processor(s).

Processor 0 ID displays the processor serial number of processor 0.

Clock Speed (under **Processor 0 ID**) displays the rated internal speed of processor 0.

Cache Size (under **Processor 0 ID**) displays the amount of level-2 (L2) cache for processor 0.

Processor 1 ID displays the processor serial number of processor 1.

Clock Speed (under **Processor 1 ID**) displays the rated internal speed of processor 1.

Cache Size (under **Processor 1 ID**) displays the amount of L2 cache for processor 1.

Diskette Drive A and Diskette Drive B

Diskette Drive A and **Diskette Drive B** identify the type of diskette drives installed in your computer. With the standard cabling configuration, **Diskette Drive A** (the boot diskette drive) is the 3.5-inch diskette drive installed in the top externally accessible drive bay; **Diskette Drive B** is a second diskette drive installed in any of the lower externally accessible drive bays.

The **Diskette Drive A** and **Diskette Drive B** options have the following possible settings:

- **5.25 Inch, 360 KB**
- **5.25 Inch, 1.2 MB**
- **3.5 Inch, 720 KB**
- **3.5 Inch, 1.44 MB**
- **Not Installed**

*NOTES: Tape drives are not reflected in the **Diskette Drive A** and **Diskette Drive B** options. For example, if you have a single diskette drive and a tape drive attached to the diskette/tape drive interface cable, set **Diskette Drive A** to match the characteristics of the diskette drive and set **Diskette Drive B** to **Not Installed**.*

*If your system has LS-120 SuperDisk drives installed in place of 1.44-MB diskette drives, set these options to **Not Installed**.*

*If your system has a 1.44 MB diskette drive as Diskette Drive A and you install a SuperDisk LS-120 diskette drive in one of the lower externally accessible drive bays, the system will automatically assign drive letter **B** to it.*

Integrated Devices

Integrated Devices configures the following devices integrated with the system board:

- **Sound**
- **Network Interface Controller**
- **Mouse Port**
- **Serial Port 1**and **Serial Port 2**
- **Parallel Port**
- **IDE Drive Interface**
- **Diskette Interface**
- **USB Emulation**
- **PC Speaker**
- **Video DAC Snoop**
- **SCSI Controllers**

Press <Enter> to configure these options as explained in the following subsections.

Sound

Sound determines whether the integrated audio controller is **On** or **Off**. The default is **On**.

Network Interface Controller

Network Interface Controller determines whether the integrated network interface controller (NIC) is **On**, **Off**, or **On w/ MBA**. The default is **On w/ MBA**, which means that the NIC is enabled and set to boot the system remotely from a network server. If you select **On w/ MBA**, you are prompted to press <Ctrl><Alt><b> at the Dell logo screen during boot. A menu then appears that allows you to select **PXE**, **RPL**, **BootP**, or **NetWare** as the active boot mode.

Mouse Port

Mouse Port enables or disables the system's integrated Personal System/2 (PS/2)-compatible mouse port. Disabling the mouse allows an expansion card to use interrupt request (IRQ)12.

Serial Port 1 and Serial Port 2

Serial Port 1 and **Serial Port 2** configure the system's integrated serial ports. You can set these options to **Auto** (the default) to automatically configure a port, to a particular designation (**COM1** or **COM3** for **Serial Port 1**; **COM2** or **COM4**for **Serial Port 2**), or to **Off** to disable the port.

If you set a serial port to **Auto** and add an expansion card containing a port configured to the same designation, the system automatically remaps the integrated port to the next available port designation that shares the same IRQ setting as follows:

- **COM1** (input/output [I/O] address 3F8h), which shares IRQ4 with **COM3**, is remapped to **COM3** (I/O address 3E8h).
- **COM2** (I/O address 2F8h), which shares IRQ3 with **COM4**, is remapped to **COM4** (I/O address 2E8h).

*NOTE: When two COM ports share an IRQ setting, you can use either port as necessary, but you may not be able to use them both at the same time. If the second port (**COM3** or **COM4**) is also in use, the integrated port is turned off.*

Parallel Port

Parallel Port configures the system's integrated parallel port. Press <Enter> to configure **Parallel Port** options as explained in the following subsections.

- **Mode** You can set this option to **PS/2**, **EPP**, **ECP**, **AT**, or **Off** to disable the port.

  Set this option according to the type of peripheral device connected to the parallel port. To determine the correct mode to use, see the documentation that came with the device.

- **I/O Address** This option determines the I/O address used by the parallel port and appears except when **Mode** is set to **Off**. You can set **I/O Address** to **378h** (the default), **278h**, or **3BCh**.

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

- **DMA Channel** This option determines the direct memory access (DMA) channel used by the parallel port and appears only when **Mode** is set to **ECP**. The available options are **DMA 1**, **DMA 3**, and **Off**.

IDE Drive Interface

IDE Drive Interface enables or disables the system's integrated enhanced integrated drive electronics (EIDE) hard-disk drive interface.

With **Auto** (the default) selected, the system turns off the integrated EIDE interface when necessary to accommodate a controller card installed in an expansion slot.

As part of the boot routine, the system first checks for a primary hard-disk drive controller card installed in an expansion slot. If no card is found, the system enables the integrated EIDE interface to use IRQ14 and IRQ15.

If a primary controller is detected on the expansion bus, the integrated EIDE interface is disabled.

Selecting **Off** disables the integrated EIDE interface.

Diskette Interface

Diskette Interface controls the operation of the system's integrated diskette drive controller.

With **Auto** (the default) selected, the system turns off the integrated diskette drive controller when necessary to accommodate a controller card installed in an expansion slot.

With **Read Only** selected, nothing can be written to any diskette drives and tape drives using the system's integrated diskette/tape drive controller. (The system can still read from the drives.) When **Read Only** is selected, **Auto** (whereby the system turns off the integrated diskette drive controller as necessary) is also in effect.

Selecting **Off** turns off the integrated diskette/tape drive controller; this setting is used primarily for troubleshooting purposes.

USB Emulation

USB Emulation determines whether the system basic input/output system (BIOS) controls Universal Serial Bus (USB) keyboards and mice. When **On** is selected, the system BIOS controls USB keyboards and mice until a USB driver is loaded by the operating system. When **Off** is selected (the default), the system BIOS does not control USB keyboards and mice, though they are functional during the boot routine. Set **USB Emulation** to **Off** if you are using a Personal System/2 (PS/2)-compatible keyboard and mouse.

PC Speaker

PC Speaker determines whether the integrated speaker is **On** (the default) or **Off**. A change to this option takes effect immediately (rebooting the system is not required).

*NOTE: The **PC Speaker** option in the System Setup program enables or disables the legacy PC beep. It does not turn the internal monophonic speaker on or off. The BIOS beep codes are always audible regardless of this option setting.*

Video DAC Snoop

Video DAC Snoop lets you correct video problems that may occur when you use certain video expansion cards. The default is **Off**. If you are using a video expansion card and problems such as incorrect colors or blank windows occur, set **Video DAC Snoop** to **On**.

SCSI Controllers

SCSI Controllers turns the integrated SCSI channels **On** or **Off** (the default).

Keyboard NumLock

Keyboard NumLock determines whether your system boots with the Num Lock mode activated on 101- or 102-key keyboards (it does not apply to 84-key keyboards).

When Num Lock mode is activated, the rightmost bank of keys on your keyboard provides the mathematical and numeric functions shown at the tops of the keys. When Num Lock mode is turned off, these keys provide cursor-control functions according to the label on the bottom of each key.

PCI IRQ Assignment

PCI IRQ Assignment specifies which IRQ lines are assigned to the Peripheral Component Interconnect (PCI) devices installed in the computer. Press <Enter> to configure these devices. Then select the device whose IRQ line you want to change, and press the plus (+) or minus (–) key to scroll through the available IRQ lines. Normally you do not need to change the IRQ lines assigned to PCI devices unless a particular device, device

driver, or operating system requires a specific IRQ line already in use by a PCI device.

NOTE: Manually assigning a particular IRQ line to a device may cause a conflict with another device trying to use the same IRQ line, which can cause one of the devices or the system to become unstable or inoperable.

Primary Drive *n* and Secondary Drive *n*

Primary Drive *n* identifies drives attached to the primary EIDE interface connector (labeled "IDE1") on the system board; **Secondary Drive *n*** identifies drives connected to the secondary EIDE interface connector (labeled "IDE2"). Use the secondary EIDE interface connector for EIDE CD-ROM and EIDE tape drives.

*NOTES: For all devices obtained from Dell that use the integrated EIDE controller, set the appropriate **Drive** option to **Auto**.*

You must have an EIDE device connected to the primary EIDE interface if you have an EIDE device connected to the secondary EIDE interface.

The following settings identify the type of EIDE devices installed in the computer:

- **Auto** (use this setting for all EIDE devices from Dell)
- **Off**
- **User 1** or **User 2**
- A specific drive-type number

To choose a setting for each option, press <Enter> to access the field's pop-up settings menu. Then type characters from the keyboard or press the left- or right-arrow key to cycle through the settings.

A *drive-type number* specifies the parameters of a hard-disk drive, based on a table recorded in the system's BIOS.

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

If You Have a Problem

If the system generates a drive error message the first time you boot your system after you install an EIDE drive, it may mean that your particular drive does not work with the automatic drive-type detect feature. If you suspect that your problem is related to drive type, try entering your drive-type information in one of the following ways:

- If you know the drive-type number

  Use the drive-type number you found in the documentation that came with the drive.

  To set the drive-type number in System Setup, highlight the appropriate drive option (**Primary Drive 0** or **Primary Drive 1**) and type the correct drive-type number. If you prefer, you can press the right- or left-arrow key to increase or decrease, respectively, the drive-type number until the correct one is displayed.

- If you do not know the drive-type number

  The **Drive 0** and **Drive 1** options display the following parameters for each drive:

  - **Drive Type** indicates the drive-type number for the selected hard-disk drive.
  - **Capacity** (automatically calculated by the system) indicates the number of millions of bytes of storage provided by the drive.
  - **Cylinders** indicates the number of logical cylinders.
  - **Heads** indicates the number of logical heads in the drive.
  - **Sectors** indicates the number of logical sectors per track.

If none of the supported drive types match the parameters of your new drive, you can enter your own parameters. To do so, highlight the **Drive 0** option and type u to display **User 1**. You can then press the right-or left-arrow key to switch between the **User 1** and **User 2** settings (only two user-defined drive types are allowed). Then press <Tab> to highlight each of the parameter fields in succession, and enter the appropriate number for each field.

*NOTE: You can use the **User 1** and **User 2** drive types for both the **Primary** and **Secondary Drive 0** and **Drive 1** options. However, if you select the **User 1** or **User 2** drive type, you may not obtain optimum hard-disk drive performance. Also, you cannot use the **User 1** and **User 2** drive types for hard-disk drives with a storage capacity that is greater than 528 megabytes (MB).*

Primary Video Controller

Primary Video Controller determines whether the system looks for a video card in a PCI slot during the boot routine. When **Auto** is selected, the system uses any PCI video card it finds during the boot routine. If no PCI video card is found, the system uses the video card in the Accelerated Graphics Port (AGP) slot. When **AGP** is selected, the system uses the video card in the AGP slot as the primary video controller. If you have both a PCI and an AGP card, setting this option to **Auto** designates the PCI card as primary video; setting it to **AGP** designates the AGP card as primary video.

Remote Wake Up

Remote Wake Up allows you to set the Remote Wake Up feature to **On** or **Off**. You must reboot your system before a change takes effect.

Report Keyboard Errors

Report Keyboard Errors enables or disables reporting of keyboard errors during the power-on self-test (POST), which is a series of tests that the system performs on the hardware each time you turn on the system or press the reset button.

This option is useful when applied to self-starting servers or host systems that have no permanently attached keyboard. In these situations, selecting **Do Not Report** suppresses all error messages relating to the keyboard or to the keyboard controller during POST. This setting does not affect the operation of the keyboard itself if a keyboard is attached to the computer.

Second Processor

Second Processor enables or disables a second processor for troubleshooting purposes. If the system is having processor-related problems, you can disable the second processor to see if the problem is isolated to this processor. This option appears only if the system has two processors.

System Data

The following information about the system is displayed in the system data area of the **System Setup** screen:

- The processor type and BIOS level.
- The size of the integrated L2 cache.
- The system's five-character service tag number, which was programmed into NVRAM by Dell during the manufacturing process. Refer to this number during technical assistance or service calls. The service tag number is also accessed by certain Dell support software, including the diagnostics software.

System Date

System Date resets the date on the computer's internal calendar.

Your system automatically displays the day of the week corresponding to the settings in the **month**, **day-of-month**, and **year** fields.

To change the date, press the left- or right-arrow key to select a field, and then press plus (+) or minus (–) to increase or decrease the number. If you prefer, you can type numbers in the **month**, **day-of-month**, and **year** fields.

System Memory

System Memory indicates the entire amount of installed memory detected in your system. After you add memory, check this option to confirm that the new memory is installed correctly and is recognized by the system.

System Security

System Security configures the following password and chassis intrusion options:

- **System Password**
- **Password Status**
- **Setup Password**

- **Chassis Intrusion**
- **CPU Serial Number**

Press <Enter> to configure these options as explained in the following subsections.

System Password

System Password displays the current status of your system's password security feature and allows you to assign and verify a new password. No one can assign a new password unless the current status is **Not Enabled**, which is displayed in bright characters.

The **System Password** option has the following settings:

- **Not Enabled** (the default)
- **Enabled**
- **Disabled by Jumper**

NOTE: See "Using the System Password Feature" for instructions on assigning a system password and using or changing an existing system password. See "Disabling a Forgotten Password" for instructions on disabling a forgotten system password.

Password Status

When **Setup Password** is set to **Enabled**, **Password Status** allows you to prevent the system password from being changed or disabled at system start-up.

To lock the system password, you must first assign a setup password in **Setup Password** and then change the **Password Status** option to **Locked**. When **Setup Password** has a password assigned and **Password Status** is set to **Locked**, the system password cannot be changed through the **System Password** option and cannot be disabled at system start-up by pressing <Ctrl><Enter>.

To unlock the system password, you must enter **Setup Password** and then change the **Password Status** option to **Unlocked**. When the option is set to **Unlocked**, you can disable the system password at system start-up by pressing <Ctrl><Enter>. Then change the password through the **System Password** option.

Setup Password

Setup Password lets you restrict access to System Setup in the same way that you restrict access to your system with the system password feature. The settings are:

- **Not Enabled** (the default)
- **Enabled**
- **Disabled by Jumper**

NOTE: See "Using the Setup Password Feature" for instructions on assigning a setup password and using or changing an existing setup password. See "Disabling a Forgotten Password" for instructions on disabling a forgotten setup password.

Chassis Intrusion

Chassis Intrusion displays the status of the system chassis intrusion monitor and can be set to **Enabled, Enabled-Silent**, or **Disabled**. The default is **Enabled**.

If the computer cover is removed while the intrusion monitor is set to **Enabled**, a Desktop Management Interface (DMI) event is generated, the setting changes to **Detected**, and the following message appears during the boot routine at the next system start-up:

```
Alert! Cover was previously removed.
```

If the computer cover is removed while the intrusion monitor is set to **Enabled-Silent**, a DMI event is generated and the setting changes to **Detected**, but the alert message does not appear during the boot sequence at the next system start-up.

If the intrusion monitor is set to **Disabled**, no intrusion monitoring occurs and no messages appear.

To reset the **Detected** setting, enter System Setup during the system's POST. In the **Chassis Intrusion** option, press the left- or right-arrow key to select **Reset**, and then choose **Enabled**, **Enabled-Silent**, or **Disabled**.

*NOTE: When the setup password is enabled, you must know the setup password before you can reset the **Chassis Intrusion** option.*

CPU Serial Number

CPU Serial Number determines whether the processor serial number(s) (if any) is provided to programs that request it. When **Enabled** is

selected, the system provides the processor serial number(s) to programs that request it. When **Disabled** is selected, the system never provides the processor serial number(s). The default is **Disabled**.

System Time

System Time resets the time on the computer's internal clock.

Time is kept in a 24-hour format (*hours:minutes:seconds*). To change the time, press the left- or right-arrow key to select a field, and then press plus (+) or minus (–) to increase or decrease the number. If you prefer, you can type numbers in each of the fields.

ZIP Floppy Support

ZIP Floppy Support enables or disables the support of Advanced Technology Attachment Packet Interface (ATAPI) ZIP devices by the system BIOS. When **Enabled** is selected, ATAPI ZIP devices are supported as diskette drives, and the first ZIP device is listed as a bootable device under **Boot Sequence**. When **Disabled** is selected, the system BIOS ignores ATAPI ZIP devices, though the operating system may still support them.

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Software Checks: Dell Precision™ WorkStation 620 Systems User's Guide

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Overview

Because most computers have several application programs installed in addition to the operating system, isolating a software problem can be confusing. Software errors can also appear to be 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 computer problem is caused by software by running the **System Board Devices** test group as described in "Dell Diagnostics." If all tests in the test group complete successfully, the error is most likely caused by software.

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

Installing and Configuring Software

When you obtain software, check it for viruses with virus-scanning software before you install it on your computer's hard-disk drive. Viruses, pieces of code that can replicate themselves, can quickly use all available system memory, damage 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, and most bulletin board services (BBS) archive freely distributed virus-scanning programs that you can download with a modem.

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 on its program diskette(s) or CD(s).

The software installation routine assists you in transferring the appropriate program files to your computer's hard-disk drive. Installation instructions may provide details about how to configure your operating system to successfully run the program. Always read the installation instructions before you run a program's installation routine. You may be instructed to modify some operating system start-up files, such as **config.sys** and **autoexec.bat**, or the installation routine may modify start-up files automatically.

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

Error Messages

Error messages can be produced by an application program, the operating system, or the computer. "Messages and Codes" discusses the error messages that are generated by the system. If you receive an error message that is not listed in "Messages and Codes," check your operating system or application program documentation.

Input Errors

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

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

Program Conflicts

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

Application programs that use specialized subroutines called *device drivers* can also cause problems with your computer system. For example, a variation in the way the data is sent to the monitor may require a special screen driver program that expects a certain kind of video mode or monitor. In such cases, you may have to develop an alternative method of running that particular program—the creation of a boot file made especially for that program, for example. Call the support service for the software you are using to help you with this problem.

Memory Address Conflicts

Memory address conflicts occur when two or more devices try to access the same address in the upper memory blocks (UMB). For example, if a network expansion card and an expanded-memory page frame are assigned an overlapping block of addresses, a memory address conflict arises. As a result, when you try to log in to the network, the operation fails.

To resolve this type of conflict, you can change the address of one of the devices. For example, in the case of the network expansion card and expanded-memory page-frame address conflict, you can move the network card to an address block in the range of CC000h through D0000h. To reassign the expansion card's address block, refer to the documentation for the card.

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 documentation for the default IRQ-line setting for each installed expansion card. Then consult Table 1 to configure the card for one of the available IRQ lines.

NOTE: Table 1 lists default IRQ settings. In systems with Plug and Play capabilities, you can modify the default settings. If you install a Plug and Play card in a Plug and Play system, the system automatically selects an open IRQ line if any are available. If you install a non-Plug and Play or legacy card, you may need to run the ISA Configuration Utility to determine the current IRQ settings and to find an available IRQ line.

Table 1. Default IRQ Line Assignments

IRQ Line	Used/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
IRQ4	Used by serial port 1
IRQ5	Available
IRQ6	Used by the diskette/tape drive controller
IRQ7	Used by the parallel port
IRQ8	Used by the real-time clock (RTC)
IRQ9	ACPI
IRQ10	Available
IRQ11	Available
IRQ12	Used by the mouse port
IRQ13	Used by the math coprocessor (if applicable)
IRQ14	Used by the primary integrated drive electronics (IDE) controller
IRQ15	Used by the secondary IDE controller

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Microprocessor

Microprocessor type	dual Intel® Pentium III® Xeon™ microprocessors with a front-side bus external speed of 133 MHz. A slower compatibility speed can be set through the System Setup program. See your System Setup screens to identify your system's speed. *NOTE: Dell Precision WorkStation 620 systems support 2.8-V processor cartridges only.*
Internal cache	32 KB first-level (16-KB data cache; 16-KB instruction cache)
L2 cache memory	See your System Setup screens to determine the amount of cache your system supports.
Math coprocessor	internal to microprocessor

System Information

System chip set	Intel 840
Data bus width	64 bits
Address bus width	32 bits
DMA channels	eight
Interrupts	15
System BIOS	Y2K-, DMI 2.0s-, SMBIOS 2.3-compliant BIOS in 4-Mb flash chip
Audio controller	integrated Crystal SoundFusion CS4614 PCI sound controller with Crystal AC97 CS4297 Codec
Integrated dual channel PCI SCSI controller	Adaptec 7899 Ultra 160/M LVD (160 MB/s)
NIC	integrated 10/100 3COM® Ethernet controller with Wakeup On LAN and Total Cost of Ownership (TCO) message capabilities (3C920 based and 3C905-TX compatible)
System clock	133 MHz

Expansion Bus

Bus types	PCI, PCI/RAID, and AGP
Bus speeds	PCI: 32-bit bus 33.3 MHz and 64-bit bus 33.3 MHz and 66.6 MHz PCI/RAID: 33.3 MHz AGP Pro: 66.6 MHz (4x-capable)
PCI expansion-card connectors	four 32-bit and two 64-bit
PCI/RAID expansion-card connector	one (32 bit)
AGP expansion-card connector	one
PCI expansion-card connector size	120 pins
PCI expansion-card connector maximum data width	32 bits and 64 bits

Memory

Architecture	RDRAM technology
Memory slots	8 RIMMs (4 on each MEC)
Memory module capacities	64-, 128-, 256-, and 512-MB 800 MHz with ECC
BIOS address	F000:0000h-F000:FFFFh

Drives

Externally accessible bays:	one 3.5-inch bay for a 3.5-inch diskette drive; three 5.25-inch bays for removable media devices
Internally accessible bays:	four 3.5-inch bays for up to four 1-inch-high hard-disk drives, up to three 1.6-inch-high hard-disk drives, or two 1-inch-high hard-disk drives and two 1.6-inch-high hard-disk drives

Ports and Connectors

Externally accessible:	
Serial (DTE)	two 9-pin connectors; 16550-compatible
Parallel	25-hole connector (bidirectional)
Video	15-hole connector (on video card)
Audio	three 1/8-inch phone jacks for microphone, audio in, and audio out
Integrated NIC	RJ45 connector
PS/2-style keyboard	6-pin mini-DIN
PS/2-compatible mouse	6-pin mini-DIN
Secondary Ultra/Wide SCSI	68-pin connector
USB	two USB-compliant connectors
Internally accessible:	
Primary EIDE hard-disk drive	40-pin connector on PCI local bus
Secondary EIDE hard-disk drive	40-pin connector on PCI local bus
Primary Ultra 160/M LVD SCSI	68-pin connector
Secondary Narrow SCSI	50-pin connector
Diskette drive	34-pin connector
Hard-disk drive LED	4-pin connector
Remote Wake Up On LAN	3-pin connector
Audio	4-pin aux-in pocket connector; and 4-pin TAPI pocket connector
Fans	five 3-pin connectors

Graphics and Video

Graphics architecture	AGP Pro (4X) video card (see manufacturer's specifications)

Key Combinations

<Ctrl><Alt><Del>	functions differently depending on your operating system; see your operating system documentation
<F2> or <Ctrl><Alt><Enter>	starts embedded System Setup program (during POST only)
<F3> or <F12>	automatically starts the system from the network environment specified by the MBA rather than from one of the devices in the System Setup **Boot Sequence** option
<F10>	launches the utility partition (if installed) during system start-up

Controls and Indicators (External)

Reset control	push button
Power control	push button
Power indicators	green LED on control panel; blinking green in sleep state; dual-color LED on front panel—green for power, yellow for diagnostics
Hard-disk drive access indicator	green LED
Link integrity indicator	green LED for 10-Mb operation; orange LED for 100-Mb operation
Activity indicator	yellow LED
Diagnostic LEDs	four yellow or green LEDs on back of system (see "Diagnostic LEDs")

Controls and Indicators (Internal)

CPU mismatch	LED on system board
MEC mismatch	LED on system board
Suspend to RAM	LED on system board
Aux power	LED on system board

Power

DC power supply:	
Wattage	410 W
Heat dissipation	750 BTU/hr (nominal) and 1,500 BTU/hr (maximum)
Voltage	90 to 135 V at 60 Hz; 180 to 265 V at 50 Hz
Backup battery	3-V CR2032 coin cell

Physical

Height	49 cm (19.3 inches)
Width	22.1 cm (8.7 inches)
Depth	45.2 cm (17.8 inches)
Weight	16.8 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 gravities (G) at 3 to 200 Hz at 1 octave/min
Storage	0.5 G at 3 to 200 Hz at 1 octave/min
Maximum shock:	
Operating	bottom half-sine pulse with a change in velocity of 50.8 cm/sec (20 inches/sec)
Storage	27-G faired square wave with a velocity change of 508 cm/sec (200 inches/sec)
Altitude:	
Operating	–16 to 3048 m (–50 to 10,000 ft)
Storage	–16 to 10,600 m (–50 to 35,000 ft)

NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.

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Using System Setup: Dell Precision™ WorkStation 620 Systems User's Guide

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- System Setup Navigation Keys
- Using the System Password Feature
- Using the Setup Password Feature
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Overview

Each time you turn on your computer system or press the reset button, the system compares the hardware installed in the system to the hardware listed in the system configuration information stored in nonvolatile random-access memory (NVRAM) on the system board. If the system detects a discrepancy, it generates error messages that identify the incorrect configuration settings. The system then prompts you to enter System Setup to correct the setting.

You can use System Setup as follows:

- To change the system configuration information after you add, change, or remove any hardware in your system
- To set or change user-selectable options—for example, the time or date on your system

You can view the current settings at any time. When you change a setting, in many cases you must reboot the system before the change takes effect.

Dell has set up your system for optimal operation, and under most circumstances you should not have to change any of the settings. After you set up your system, run System Setup to familiarize yourself with your system configuration information and optional settings in case you need to change them. Dell recommends that you print the System Setup screens (by pressing <Print Screen>) or record the information for future reference.

Before you use System Setup, you need to know the kind of diskette drive(s) and hard-disk drive(s) installed in your computer. If you are unsure of this information, see the Manufacturing Test Report that was shipped with your system and is located in the **Dell Accessories** folder.

Entering System Setup

To enter System Setup, perform the following step

1. Turn on your system.

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

2. When the **Press <F2> to Enter Setup** window appears in the upper-right corner of the screen, press <F2>.

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 Screen

The **System Setup** screen displays the current setup and configuration information and optional settings for your system. Information on the **System Setup** screen is organized in four areas:

- Title — The box at the top of all screens lists the system name.
- System data — The two boxes below the title box display your system processor, level 2 (L2) cache, service tag, and the version number of the basic input/output system (BIOS).
- Options — The main area of the screen is a scrollable window containing options that define the installed hardware in your computer and the power conservation and security features for your computer.

  Fields next to the options contain settings or values. You can change those values that appear bright on the screen. Options or values that you cannot change (because they are determined or calculated by the computer) appear less bright.

- Key functions — The line of boxes across the bottom of all screens lists keys and their functions within System Setup.

System Setup Navigation Keys

Table 1 lists the keys you use to view or change information on the **System Setup** screen and to exit the program.

Table 1. System Setup Navigation Keys

Keys	Action
Tab or ↓	Moves to the next field.
Shift Tab or ↑	Moves to the previous field.
← or →	Cycles through the options in a field. In many fields, you can also type the appropriate value.
Page Down or Page Up	Scrolls through help information.
Enter	Enters the selected field's pop-up options menu.
spacebar or + or -	In the selected field's pop-up options menu, cycles through the options in a field.
Esc	Saves the selected settings in a field's pop-up settings menu and returns to the main **System Setup** screen. For a few options (as noted in the help area) the changes take effect immediately. Exits the System Setup program at the **System Setup** screen if no settings in any option were changed. Provides the following exit menu options if changes were made. Highlight a menu option to select it, and press <Enter> to activate it. • **Save Changes and Exit** exits the System Setup program and reboots the system, implementing any changes you have made. • **Discard Changes and Exit** exits the System Setup program without saving your changes and resumes the boot routine. • **Return to Setup** returns to the **System Setup** screen.
Alt X	Exits System Setup without rebooting the system and returns the system to its previous state—the boot routine.[1]
Alt B	Exits System Setup and reboots the system, implementing any changes you have made.
Alt D	Resets the selected option to its default setting.
F1	Displays help information for the selected option.

[1] *For most of the options, any changes you make are recorded but do not take effect until the next time you boot the system. For a few options (as noted in the help area), the changes take effect immediately.*

Using the System Password Feature

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

Your Dell™ system is shipped to you without the system password feature enabled. If system security is a concern, you should operate your system only with system password protection.

You can assign a system password whenever you use the System Setup program. After a system password is assigned, only those who know the password have full use of the system.

When **System Password** is set to **Enabled**, the computer system prompts you for the system password just after the system boots.

To change an existing system password, you must either know the password or have access to the inside of the computer.

If you assign and later forget a system password, you need your computer key to get inside the chassis, where you can change a jumper setting to disable the system password feature. Note that you erase the *setup password* at the same time.

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

Assigning a System Password

Before you can assign a system password, you must enter the System Setup program and check the **System Password** status.

With a system password assigned, the status shown in **System Password** is **Enabled**. With the system password feature disabled by a jumper setting on the system board, the status shown is **Disabled By Jumper**. *You cannot change or enter a new system password if either of these settings is displayed*.

With no system password assigned and with the password jumper on the system board in the enabled position (the default), the status shown for **System Password** is **Not Enabled**. *Only when **System Password** is set to **Not Enabled** can you assign a system password* by performing the following steps:

1. Verify that **Password Status** is set to **Unlocked**.

   For instructions on changing the setting for **Password Status**, see "**Password Status**."

2. Press the left- or right-arrow key.

   The heading changes to **Enter Password**, followed by an empty seven-character field in square brackets.

3. Type the new system password.

   You can use up to seven characters in the password.

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

   The password assignment operation recognizes keys by their location on the keyboard, without distinguishing between lowercase and uppercase characters. For example, if you have an *M* in your password, the system recognizes either *M* or *m* as correct.

   Certain key combinations are not valid. If you enter one of these combinations, the speaker emits a beep.

   To erase a character when you enter your password, press the <Backspace> key or the left-arrow key.

   NOTE: To escape from the field without assigning a system password, press the <Tab> key or the <Shift><Tab> key combination to move the highlight to another field or press the <Esc> key at any time prior to completing step 5.

4. Press <Enter>.

   If the new system password is less than seven characters, the field fills with placeholders. Then the heading changes to **Verify Password**, followed by another empty seven-character field in square brackets.

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

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

Using Your System Password to Secure Your System

Whenever you turn on your system, press the reset button, or reboot the system by pressing the <Ctrl><Alt><Del> key combination, the following prompt appears on the screen when **Password Status** is set to **Unlocked**:

```
Type in the password and...
- press <ENTER> to leave password security enabled.
- press <CTRL><ENTER> to disable password security.
Enter password:
```

If **Password Status** is set to **Locked**, the following prompt appears:

```
Type the password and press <ENTER>.
```

After you type the correct system password and press <Enter>, your system boots and you can use the keyboard to operate your system as usual.

NOTE: If you have assigned a setup password, the system accepts your setup password as an alternate system password.

If a wrong or incomplete system password is entered, the following message appears on the screen:

```
** Incorrect password. **
Enter password:
```

If an incorrect or incomplete system password is entered again, the same message appears on the screen.

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

```
** Incorrect password. **
Number of unsuccessful password
attempts: 3
System halted! Must power down.
```

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

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

*NOTE: You can use **Password Status** in conjunction with **System Password** and **Setup Password** to further protect your system from unauthorized changes.*

Deleting or Changing an Existing System Password

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

1. Enter the System Setup program and verify that **Password Status** is set to **Unlocked**.

   Enter the System Setup program by pressing the <Ctrl><Alt><Enter> key combination. Press the <Alt><p> key combination to move to Page 2 of the System Setup screens. For instructions on changing the setting for **Password Status**, see "**Password Status**."

2. Reboot your system to force it to prompt you for a system password.
3. When prompted, type the system password.
4. Press the <Ctrl><Enter> key combination to disable the existing system password, instead of pressing <Enter> to continue with the normal operation of your system.
5. Reboot the system and enter the System Setup program.
6. Confirm that **Not Enabled** is displayed for **System Password** in the System Setup program.

   If **Not Enabled** appears, the system password has been deleted. If you want to assign a new password, go to step 7.

   If **Not Enabled** is *not* displayed, press the <Alt><b> key combination to reboot the system, and then repeat steps 3 through 6.

7. Assign a system password.

Using the Setup Password Feature

Your Dell system is shipped to you without the setup password feature enabled. If system security is a concern, you should operate your system with setup password protection.

You can assign a setup password whenever you use the System Setup program. After a setup password is assigned, only those who know the password have full use of the System Setup program.

To change an existing setup password, you must know the setup password. If you assign and later *forget* a setup password, you need your computer key to get inside the chassis, where you can change a jumper setting to disable the password feature. Note that you erase the *system password* at the same time.

Assigning a Setup Password

A setup password can be assigned (or changed) only when **Setup Password** is set to **Not Enabled**. To assign a setup password, highlight **Setup Password** and press the left- or right-arrow key. The system prompts you to enter and verify the password. If a character is illegal for password use, the system emits a beep.

NOTES: The setup password can be the same as the system password.

If the two passwords are different, the setup password can be used as an alternate system password. However, the system password cannot be used in place of the setup password.

After you verify the password, the **Setup Password** setting changes to **Enabled**. The next time you enter the System Setup program, the system prompts you for the setup password.

A change to **Setup Password** becomes effective immediately (rebooting the system is not required).

Operating With a Setup Password Enabled

If **Setup Password** is set to **Enabled**, you must enter the correct setup password before you can modify the majority of the System Setup options.

When you start the System Setup program, Page 2 of the System Setup screens appears with **Setup Password** highlighted, prompting you to type the password.

If you do not enter the correct password in three tries, the system lets you view, but not modify, the System Setup screens—with the following exceptions:

- You can still modify **Date**, **Time**, **CPU Speed**, **Num Lock**, and **Speaker**.
- If **System Password** is not enabled and is not locked via **Password Status**, you can assign a system password (however, you cannot disable or change an existing system password).

*NOTE: You can use **Password Status** in conjunction with **Setup Password** to protect **System Password** from unauthorized changes.*

Deleting or Changing an Existing Setup Password

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

1. Enter the System Setup program.
2. Highlight **Setup Password**, and press the left- or right-arrow key to delete the existing setup password.

   The setting changes to **Not Enabled**.
3. If you want to assign a new setup password, follow the procedure in "Assigning a Setup Password."

Disabling a Forgotten Password

If you forget your system or setup password, you cannot operate your system or change settings in the System Setup program, respectively, until you open the computer, change the password jumper setting to disable the passwords, and erase the existing passwords.

To disable a forgotten password, perform the following steps:

CAUTION: Before you remove the computer cover, see "Safety First—For You and Your Computer."

1. Remove the computer cover.
2. Refer to "Jumpers" for jumper information and to Figure 2 in "Hardware Configuration Features" for the location of the password jumper (labeled "PSWD") on the system board.
3. Remove the jumper plug from the PSWD jumper (the *disable* setting).
4. Replace the computer cover.
5. Reconnect your computer to its electrical outlet and turn it on.

   Booting your system with the PSWD jumper plug removed erases the existing password(s).

   NOTE: Before you assign a new system and/or setup password, you must replace the PSWD jumper plug.
6. Remove the computer cover.
7. Replace the PSWD jumper plug (the *enable* setting).
8. Replace the computer cover, and then reconnect the computer and peripherals to their electrical outlets and turn them on.

   Booting with the PSWD jumper installed reenables the password features. When you enter the System Setup program, both password fields appear as **Not Enabled**, meaning that password protection is no longer available because no passwords have been assigned.
9. Assign a new system password and/or setup password.
10. Reset the chassis intrusion detector to **Enabled** or **Enabled Silent**.

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