

Dell Precision™ WorkStation 220 System 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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Models WCP and WCM

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Basic Checks: Dell Precision™ WorkStation 220 System User's Guide

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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:

1. If your computer is wet or damaged, see "[Troubleshooting a Wet Computer](#)" or "[Troubleshooting a Damaged Computer](#)."
1. Perform the steps in "[Checking Connections and Switches](#)."
1. Perform the steps in "[Look and Listen](#)."
1. 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.

1. If your system displayed a message or emitted a beep code, see "[Messages and Codes](#)."
 1. Verify the settings in [System Setup](#).
 1. 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 "[Controls and Indicators](#)" and "[Connecting Peripheral Devices](#)" for the location of your computer's external connections and switches.

Complete the following steps in the order indicated to check all the connections and switches:

1. Turn off the system, including any attached peripherals (such as the monitor, keyboard, printer, external drives, scanners, or plotters).
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 power and hard-disk drive indicators	Use the power and hard-disk drive indicators to help you identify a system problem when you press the power button to turn on the computer but the system does not boot.
The keyboard indicators	Most keyboards have one or more indicators (usually in the upper-right corner). Press <Num Lock>, <Caps Lock>, and <Scroll Lock> 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 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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Overview

A 3.0-volt (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 ten years. The battery may need replacing if an incorrect time or date is displayed during the boot routine along with a message such as:

```
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, reenter the time and date through [System Setup](#) and exit the program properly to save the information. Turn off your system and disconnect it from the electrical outlet for a few hours; then reconnect and turn on your system. Enter System Setup. If the date and time are not correct in System Setup, replace your battery.

You can operate your system without a battery; however, without a battery, the system configuration information is erased if the system is turned off or unplugged from the electrical outlet. In this case, you must enter System Setup and reset the configuration options.

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

 **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 8](#) in "Inside Your Computer."

Replacing the Battery

To replace the system battery, perform the following steps:

 **CAUTION:** Before you remove the computer cover, see "[Safety First — For You and Your Computer](#)."

1. If you have not already done so, make a copy of your system configuration information in [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.

2. Remove the computer cover according to the instructions in "[Removing and Replacing the Computer Cover](#)."
3. Remove the battery.

See [Figure 8](#) in "Inside Your Computer" for the location of the battery.

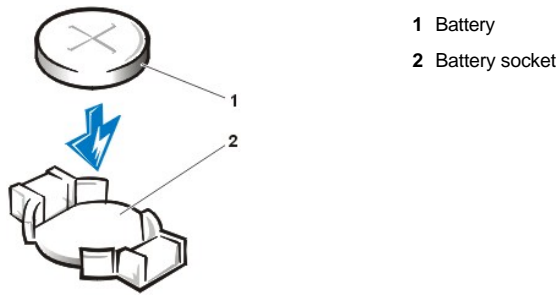
NOTICE: If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Make certain that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off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

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

4. Install the new battery.

Orient the battery with the side labeled "+" facing up (see [Figure 1](#)). Then insert the battery into the socket, and snap it into place.

Figure 1. Replacing the System Battery



5. Replace the computer cover, reconnect your computer and peripherals to their electrical outlets, and turn them on.
6. Enter [System Setup](#), and confirm that the battery is operating properly.

Enter the correct time and date through System Setup's [System Time](#) and [System Date](#) options. Also, use the copy you made in [step 1](#) of the system configuration information to restore the correct settings for other System Setup options. Then exit System Setup.

7. Turn off and unplug your computer. Leave the computer turned off for at least 10 minutes.
8. After 10 minutes, plug in the computer, turn it on, and enter System Setup. If the time and date are still incorrect, see "[Getting Help](#)" for instructions on obtaining technical assistance.

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Contacting Dell: Dell Precision™ WorkStation 220 System User's Guide

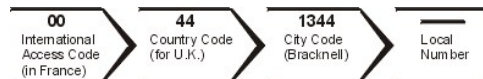
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Overview

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)	Sales, Customer Support, and Technical Support		toll free: 1230-020-4823

NOTE: Customers in

<i>Chile call the U.S.A. for sales, customer, and technical assistance</i>			
Latin America <i>NOTE: Customers in Latin America call the U.S.A. for sales, customer, and technical assistance.</i>	Customer Technical Support (Austin, Texas, U.S.A.)	512	728-4093
	Customer Service (Austin, Texas, U.S.A.)	512	728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512	728-3883
	Sales (Austin, Texas, U.S.A.)	512	728-4397
	SalesFax (Austin, Texas, U.S.A.)	512	728-4600 728-3772
Mexico <i>NOTE: Customers in Mexico call the U.S.A. for access to the Automated Order-Status System and AutoTech.</i>	Automated Order-Status System (Austin, Texas, U.S.A.)	512	728-0685
	AutoTech (Automated technical support) (Austin, Texas, U.S.A.)	512	728-0686
	Customer Technical Support	525	228-7870
	Sales	525	228-7811 toll free: 91-800-900-37 toll free: 91-800-904-49
	Customer Service	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) <i>NOTE: Customers in Austria call Langen, Germany for Technical Support and Customer Care.</i>	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) <i>NOTE: Customers in Denmark call Sweden for fax technical support.</i>	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	Home and Small Business		

(Paris/Montpellier)

Technical Support	0825	387 270
Customer Care	0825	823 833
Fax	0825	004 701
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 01
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 <i>NOTE: Customers in Luxembourg call Belgium for sales, customer, and technical assistance.</i>	Technical Support (Brussels, Belgium)	02	481 92 88
	Home/Small Business Sales (Brussels, Belgium)		toll free: 080016884
	Corporate Sales (Brussels, Belgium)	02	481 91 00
	Customer Care (Brussels, Belgium)	02	481 91 19
	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) <i>NOTE: Customers in Norway call Sweden for fax technical support.</i>	Technical Support		671 16882
	Relational Customer Care		671 17514
	Home/Small Business Customer Care		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 or 351 214 220 710
	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		

Asia and Other Regions Contact Numbers

Country (City)	Department Name or Service	Area Code	Local Number or Toll-Free Number
Australia (Sydney)	Home and Small Business		1-300-65-55-33
	Government and Business		toll free: 1-800-633-559
	Preferred Accounts Division (PAD)		toll free: 1-800-060-889
	Customer Care		toll free: 1-800-819-339
	Corporate Sales		toll free: 1-800-808-385
	Transaction Sales		toll free: 1-800-808-312
	Fax		toll free: 1-800-818-341
Brunei <i>NOTE: Customers in Brunei call Malaysia for customer assistance.</i>	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 <i>NOTE: Customers in Hong Kong call Malaysia for customer assistance.</i>	Technical Support		toll free: 800 96 4107
	Customer Service (Penang, Malaysia)		633 4949
	Transaction Sales		toll free: 800 96 4109
	Corporate Sales		toll free: 800 96 4108
Japan (Kawasaki)	Technical Support (Server)		toll free: 0120-1984-35
	Technical Support (Dimension™ and Inspiron)		toll free: 0120-1982-26
	Technical Support Outside of Japan (Dimension and Inspiron)	81-44	520-1435
	Technical Support (Dell Precision™, OptiPlex, and Latitude)		toll free: 0120-1984-33
	Technical Support Outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44	556-3894
	Customer Care	044	556-4240
	24-Hour Automated Order Status Service	044	556-3801
	Home and Small Business Group Sales	044	556-3344
	Individual User Sales	044	556-3344
	Business Sales Division (up to 400 employees)	044	556-3344
	Government, Educational, and Medical Sales	044	556-1469
	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 <i>NOTE: Customers in Macau call Malaysia for customer assistance.</i>	Technical Support		toll free: 0800 582
	Customer Service (Penang, Malaysia)		633 4949
	Transaction Sales		toll free: 0800 581
Malaysia (Penang)	Technical Support		toll free: 1 800 888 298
	Customer Service	04	633 4949
	Transaction Sales		toll free: 1 800 888 202
	Corporate Sales		toll free: 1 800 888 213
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) <i>NOTE: Customers in Singapore call Malaysia for customer assistance.</i>	Technical Support		toll free: 800 6011 051
	Customer Service (Penang, Malaysia)	04	633 4949
	Transaction Sales		toll free: 800 6011 054
	Corporate Sales		toll free: 800 6011 053
South Africa (Johannesburg)	Technical Support	011	709 7710
	Customer Care	011	709 7707
	Sales	011	709 7700
	Fax	011	706 0495
	Switchboard	011	709 7700
	Web site: http://support.euro.dell.com		
	E-mail: dell_zs_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 <i>NOTE: Customers in Thailand call Malaysia for customer assistance.</i>	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 220 System User's Guide

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[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:

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


Before You Start Testing

- 1 Read "[Safety First—For You and Your Computer](#)" and the safety instructions in your *System Information Guide*.
 - 1 Turn on your printer if one is attached, and make sure it is online.
 - 1 [Enter system setup](#), confirm your computer's system configuration information, and enable all of its components and devices, such as ports.
 - 1 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. Shut down and restart the computer.
2. Press <F2> at the start of the boot routine to access the [System Setup](#) screen.
3. Select the **Boot Sequence** option and press <Enter>.

 **NOTE:** Record your current boot sequence in the event you want to restore it after running the Dell Diagnostics.

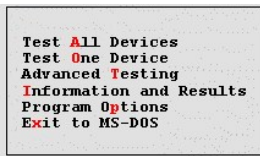
4. Select **CD/DVD/CD-RW Drive** as the first device in the boot sequence.

5. Insert the Dell *ResourceCD* into the CD-ROM drive.
6. Press <Alt> to exit system setup and save the change.


The computer reboots and the Dell logo screen appears followed by a list of the available languages.

 **NOTE:** 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.

7. Select the number for the language that you want.
A numbered list of eight options appears.
8. Select **Option 2 – Dell Diagnostics** by typing 2 and pressing <Enter>. After the diagnostics load, the following **Diagnostics Main Menu** screen appears:

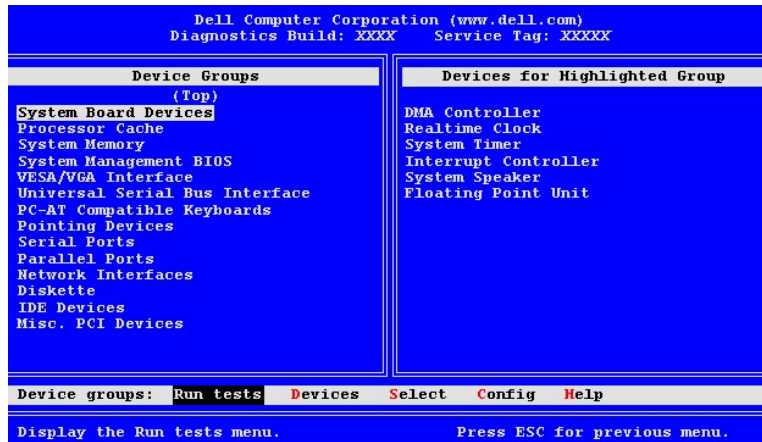


9. Select an option from the **Diagnostics Main Menu** screen by pressing the up- or down-arrow key to highlight the option and pressing <Enter>, or press the key that corresponds to the highlighted letter in the option title.
 1. **Test All Devices** — Performs quick or extensive tests on all devices.
 1. **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.
 1. **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**.
 1. **Information and Results** — Provides test results, test errors, version numbers of subtests, and additional information on the Dell Diagnostics.
 1. **Program Options** — Allows you to change the settings of the Dell Diagnostics.
 1. **Exit to MS-DOS** — Exits to the MS-DOS® prompt.
10. 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.
11. 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.
12. Select the [Advanced Testing](#) option to customize your test(s).
13. Remove the *ResourceCD* from the CD-ROM drive when you have finished running the Dell Diagnostics.

 **NOTE:** To change the boot sequence, repeat steps 1 through 6, 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:

- 1 **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.

- 1 **Devices for Highlighted Group** — Lists the computer's current hardware
- 1 **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

CD-ROM, Tape, DVD, and Zip Drives: Dell Precision™ WorkStation 220 System User's Guide

- [Installing a CD-ROM, Tape, DVD, or Zip Drive in a Mini Tower Chassis](#)
- [Installing a CD-ROM, Tape, DVD, or Zip Drive in a Desktop Chassis](#)

Installing a CD-ROM, Tape, DVD, or Zip Drive in a Mini Tower Chassis

This section describes how to install an enhanced integrated drive electronics (EIDE) CD-ROM, tape, Digital Versatile Disc (DVD), or Zip drive. For small computer system interface (SCSI) drives, see "[Installing SCSI Devices](#)."

To install a CD-ROM, tape, DVD, or Zip drive in the mini tower chassis, perform the following steps.

⚠ CAUTION: Before you remove the computer cover, see "[Safety First—For You and Your Computer](#)."

1. Unpack the drive and prepare it for installation.

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

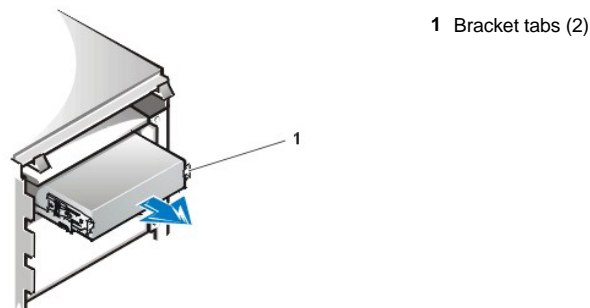
Check the documentation that accompanied the drive to verify that the drive is configured for your computer system. Change any settings necessary for your configuration.

2. For an EIDE drive, configure the drive for the **Cable Select** setting as described in the documentation that accompanied your drive.
3. Remove the computer cover as instructed in "[Removing and Replacing the Computer Cover](#)."
4. Remove the front panel as instructed in "[Removing and Replacing the Front Panel](#)."
5. 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 1](#)).

🔧 NOTE: For easier access inside the chassis, you may want to rotate the power supply out of the way temporarily. To do so, see "[Rotating the Power Supply Away From the System Board](#)."

Figure 1. Removing a Drive From the Mini Tower Chassis

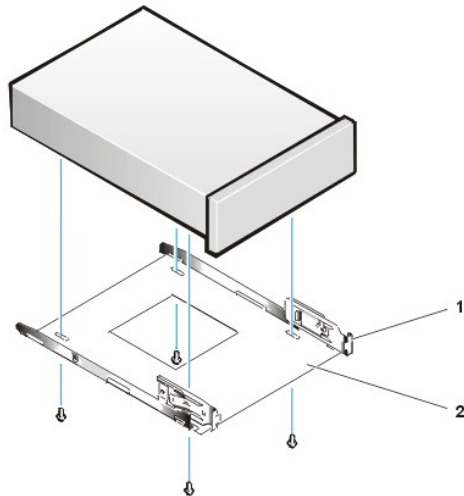


If a drive is already installed in the bay and you are replacing it, disconnect the DC power cable and interface cable from the back of the drive before sliding the bracket out of the bay. To remove the old drive from the bracket, turn the drive/bracket assembly upside down and unscrew the four screws that secure the drive to the bracket (see [Figure 2](#)).

6. Attach the drive bracket to the new drive.

Turn the drive upside down, and locate the four screw holes around its perimeter. Fit the bracket over the drive so that the screw holes align. 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 2](#)).

Figure 2. Attaching the Drive Bracket to the New Drive



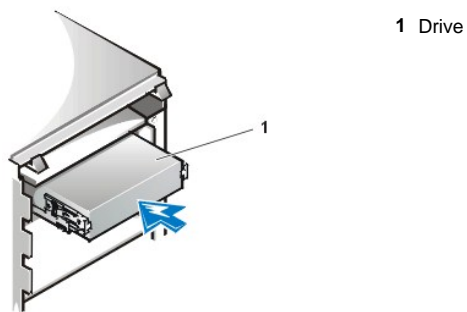
- 1 Metal tab
- 2 Drive bracket

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").

7. Slide the new drive into the drive bay until the drive snaps securely into place (see Figure 3).

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

Figure 3. Inserting the New Drive Into the Drive Bay of the Mini Tower Chassis

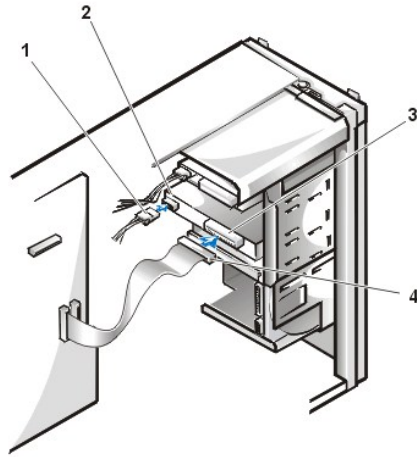


8. Connect a DC power cable to the power input connector on the back of the drive (see [Figure 4](#)).
9. Connect the appropriate interface cable to the interface connector on the back of the drive (see [Figure 4](#)).

If your system has an unused connector on an existing EIDE cable, use the spare connector. Otherwise, use the EIDE interface 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.

Figure 4. Attaching Drive Cables in the Mini Tower Chassis



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

10. If necessary, connect the other end of the interface cable to the interface connector labeled "IDE2" on the system board.
Check all cable connections. Fold cables out of the way to provide airflow for the fan and cooling vents.
11. If the 5.25-inch drive bay was previously empty, remove the front-panel insert from the front panel.
Hold the panel with the inside facing toward you and press each end of the insert with your thumbs until it snaps free of the panel.
12. Replace the front panel.
13. Replace the computer cover, reconnect your computer and peripherals to their power sources, and turn them on.
14. Update the appropriate **Secondary Drive 0** or **Secondary Drive 1** to **Auto** in [System Setup](#).
15. Verify that your system works correctly by running the [Dell Diagnostics](#).

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

Installing a CD-ROM, Tape, DVD, or Zip Drive in a Desktop Chassis

This section describes how to install an EIDE CD-ROM, tape, DVD, or Zip drive. For SCSI drives, see ["Installing SCSI Devices."](#)

To install a CD-ROM, tape, DVD, or Zip drive in the desktop chassis, perform the following steps.

 **CAUTION:** Before you remove the computer cover, see ["Safety First—For You and Your Computer."](#)

1. Unpack the drive and prepare it for installation.

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

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

2. For an EIDE drive, configure the drive for the **Cable Select** setting as described in the documentation that accompanied your drive.
3. Remove the computer cover as instructed in ["Removing and Replacing the Computer Cover."](#)
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 5](#)).


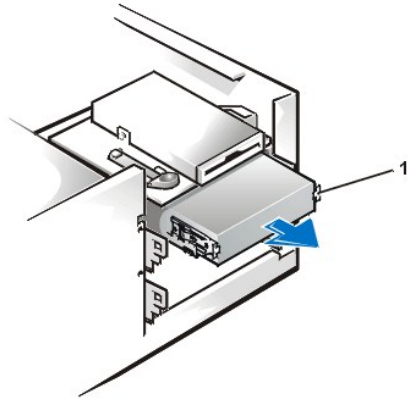
 **NOTE:** For easier access inside the chassis, you may want to rotate the power supply out of the way temporarily. To do so, see ["Rotating the Power Supply Away From the System Board."](#)

Figure 5. Removing a Drive From the Desktop Chassis

1 Bracket tabs (2)

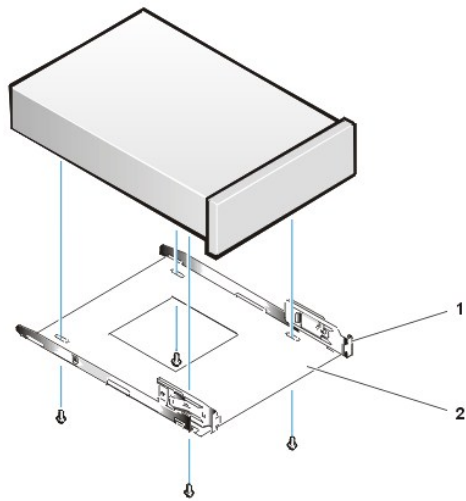


If a drive is already installed in the bay and you are replacing it, disconnect the DC power cable and interface cable from the back of the drive before sliding the bracket out of the bay. To remove the old drive from the bracket, turn the drive/bracket assembly upside down and unscrew the four screws that secure the drive to the bracket (see [Figure 6](#)).

5. Attach the drive bracket to the new drive.

Turn the drive upside down, and locate the four screw holes around its perimeter. Fit the bracket over the drive so that the screw holes align. 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 6](#)).

Figure 6. Attaching the Drive Bracket to the New Drive



1 Metal tab
2 Drive bracket

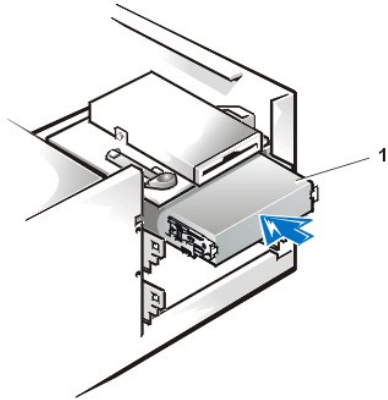
To further ensure proper positioning of the drive in the chassis, insert and tighten all four screws *in the order in which the holes are numbered* (the holes are marked "1" through "4").

6. Slide the new drive into the drive bay until the drive snaps securely into place (see [Figure 7](#)).

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

Figure 7. Inserting the New Drive Into the Drive Bay of the Desktop Chassis

1 Drive

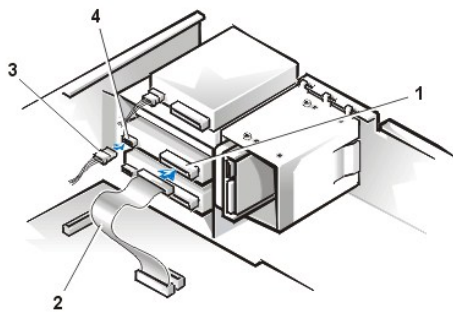


7. Connect a DC power cable to the power input connector on the back of the drive (see [Figure 8](#)).
8. Connect the appropriate interface cable to the interface connector on the back of the drive (see [Figure 8](#)).

If your system has an unused connector on an existing EIDE cable, use the spare connector. Otherwise, use the EIDE interface 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.

Figure 8. Attaching Drive Cables in the Desktop Chassis



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

9. If necessary, connect the other end of the interface cable to the interface connector labeled "IDE2" on the system board.
Check all cable connections. Fold cables out of the way to provide airflow for the fan and cooling vents.
10. If the 5.25-inch drive bay was previously empty, remove the front-panel insert from the computer cover.
Hold the cover with the inside facing toward you and press each end of the insert with your thumbs until it snaps free.
11. Replace the computer cover, reconnect your computer and peripherals to their power sources, and turn them on.
12. Update the appropriate **Secondary Drive 0** or **Secondary Drive 1** to **Auto** in [System Setup](#).
13. Verify that your system works correctly by running the [Dell Diagnostics](#).

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

Expansion Cards: Dell Precision™ WorkStation 220 System User's Guide


[Overview](#)

[Removing an Expansion Card](#)

[Installing an Expansion Card](#)

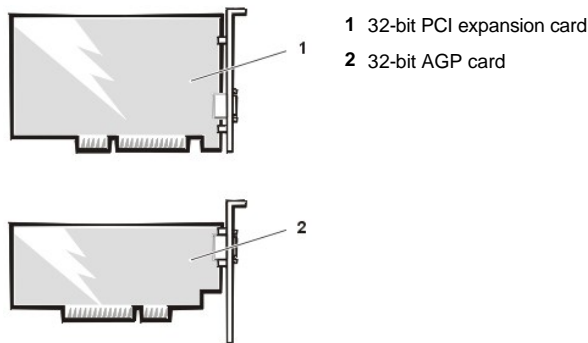
Overview

The system accommodates up to six expansion cards, including up to five 32-bit Peripheral Component Interconnect (PCI) expansion cards and a 32-bit accelerated graphics port (AGP) card. (See Figure 1 for examples of these cards.)

 **NOTES:** To meet PC99 Workstation requirements, your Dell system uses only PCI expansion slots. Industry-Standard Architecture (ISA) expansion cards are not supported.

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 8](#) in "Inside Your Computer."

Figure 1. Expansion Cards




Installing an Expansion Card

Follow this general procedure to install an expansion card.

 **CAUTION:** Before you remove the computer cover, see "[Safety First—For You and Your Computer.](#)"

1. Prepare the expansion card for installation, and remove the computer cover according to the instructions in "[Removing and Replacing the Computer Cover.](#)"

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

 **CAUTION:** Some network cards automatically start up the system when they are connected. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any expansion cards. Verify that the standby power light-emitting diode (LED) on the system board is off.

2. If you have a mini tower chassis and you are installing or replacing an AGP card, remove the AGP card brace according to the instructions in "[Removing and Replacing the AGP Card Brace.](#)"
3. Remove the AGP card brace.

If you have an AGP card clip, disconnect any cables attached to the card and press the AGP card clip lever away from the power supply.


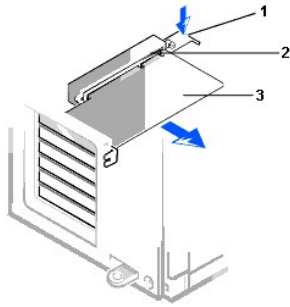
 **NOTE:** Do not remove the video card retention clip from the expansion card slot.

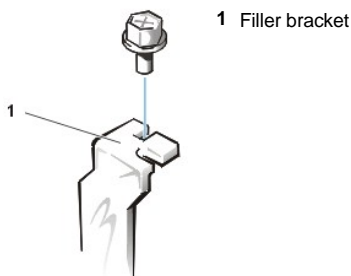
Figure 2. AGP Card Clip



- 1 AGP card clip lever
- 2 AGP card clip
- 3 AGP card

4. 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 installing the expansion card later in this procedure.

Figure 3. Removing the 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's edge connector firmly into the expansion-card slot. Gently rock the card into the connector until it is fully seated (see Figure 4).


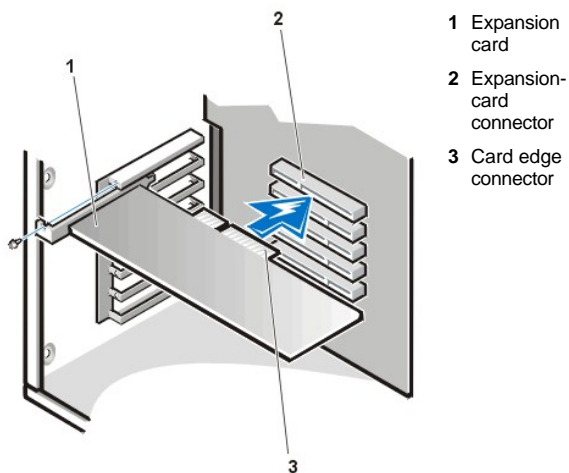
 **NOTE:** The procedure for installing an expansion card in the desktop chassis is the same as that shown for the mini tower chassis in Figure 4.

Figure 4. Installing an Expansion Card (Mini Tower Chassis)



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


5. When the card is firmly seated in the connector, secure the card's mounting bracket to the chassis with the screw you removed in step 2.
6. Connect any cables that should be attached to the card.

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

7. If you removed the AGP brace in step 2, replace it.

If you released the AGP card clip, push the lever so that the lever is out of the way while you install a new card or filler bracket. Release the lever when the card or filler bracket is installed.


8. Replace the computer cover, and 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.

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

See "[Chassis Intrusion](#)" for instructions.

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


While in System Setup, if you installed a sound card, select **Integrated Devices** and change the setting for **Sound** to **Off**.

Removing an Expansion Card


To remove an expansion card, perform the following steps:

 **CAUTION:** Before you remove the computer cover, see "[Safety First—For You and Your Computer](#)."

1. Remove the computer cover according to the instructions in "[Removing and Replacing the Computer Cover](#)."
2. If you have a mini tower chassis and you are installing or replacing an AGP card, remove the AGP card brace according to the instructions in "[Removing and Replacing the AGP Card Brace](#)."
3. If necessary, 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. If you removed the AGP brace in step 2, replace it.
8. Replace the computer cover, and 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.

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

See "[Chassis Intrusion](#)" for instructions.

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

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External Components: Dell Precision™ WorkStation 220 System User's Guide

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 [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 a copy of 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:

- 1. Monitor or monitor interface cable
- 1. 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 each of the following steps in the order indicated 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 the order indicated 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 the order indicated 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 a printer, scanner, or other peripheral device.

You can also use this procedure to test I/O ports on expansion cards. However, you should first complete the procedures in "[Troubleshooting Expansion Cards](#)" to verify 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 not at all, the source of the problem may be any of the following:

- 1 A faulty connection between the I/O port and the peripheral device
- 1 A faulty cable between the I/O port and the peripheral device
- 1 A faulty peripheral device
- 1 Incorrect settings in [System Setup](#)
- 1 Incorrect settings in the system's configuration files
- 1 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, follow these steps in the order indicated 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 the order indicated 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).

If 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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Hard-Disk Drives: Dell Precision™ WorkStation 220 System User's Guide

[Overview](#)

[Installing an EIDE Hard-Disk Drive in the Desktop Chassis](#)

[Installing an EIDE Hard-Disk Drive in the Mini Tower Chassis](#)

[Installing SCSI Devices](#)

Overview

You can install up to two enhanced integrated drive electronics (EIDE) drives in the hard-disk drive bracket.

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 interface cable. When two EIDE devices are connected to a single EIDE interface 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 CD-ROM, tape, Digital Versatile Disc (DVD), and Zip drives should be connected to the EIDE interface connector labeled "IDE2."

Installing an EIDE Hard-Disk Drive in the Mini Tower Chassis

To install an EIDE hard-disk drive in the mini tower chassis, perform the following steps:

 **CAUTION:** Before you remove the computer cover, see "[Safety First — For You and Your Computer.](#)"

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

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

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

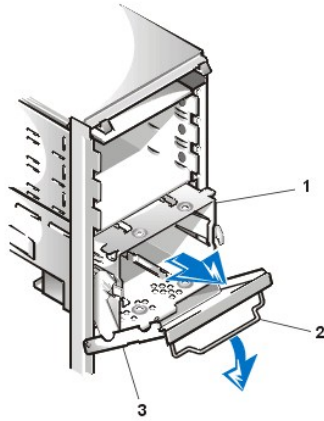
Check the documentation for the drive to verify that it is configured for your computer system.

3. Remove the computer cover as instructed in "[Removing and Replacing the Computer Cover.](#)"
4. Remove the front panel as instructed in "[Removing and Replacing the Front Panel.](#)"
5. Remove the drive bracket from the chassis.

If a hard-disk drive is already installed in the drive bracket, disconnect the DC power cable and EIDE cable from the drive.

Pull the drive door forward and down until the hard-disk drive bracket is ejected halfway out of the chassis (see Figure 1). Then grasp the bracket and pull it completely out of the chassis.

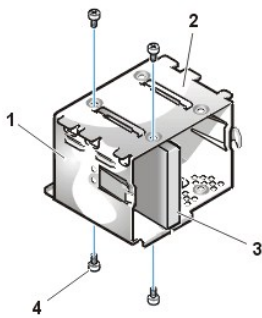
Figure 1. Removing the Hard-Disk Drive Bracket From the Mini Tower Chassis



- 1 Hard-disk drive bracket
- 2 Drive door handle
- 3 Drive door

6. Slide the drive into the chosen bay of the bracket, oriented so that the connectors on the back of the drive will face the back of the chassis when the bracket is reinstalled (see [Figure 2](#)).
7. Align the four screw holes of the drive and bracket. Insert and tighten the screws that came with your upgrade kit (see Figure 2).

Figure 2. Inserting a Hard-Disk Drive in the Bracket for the Mini Tower Chassis



- 1 Drive bracket
- 2 Second drive bay
- 3 Drive
- 4 Screws (4)

8. Reinstall the hard-disk drive bracket in the chassis (see [Figure 3](#)).

Insert the bracket into the drive cage by sliding it in until the tabs snap into place. Rotate the drive door up and toward the chassis until it snaps securely into place. Be sure to fold down the drive door handle (see [Figure 1](#)) so that the front panel can be replaced on the chassis.


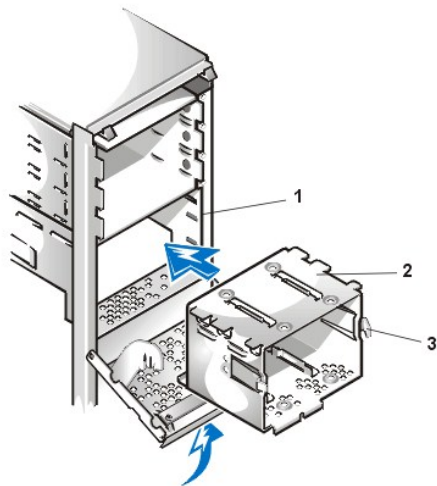
 **NOTE:** When you rotate the drive door back into place, make sure that the tabs on the drive door are inserted between the drive bracket and the drive cage.

Figure 3. Inserting the Drive Bracket in the Mini Tower Chassis



- 1 Drive cage
- 2 Drive bracket
- 3 Tabs

9. Connect a DC power cable to the power input connector on the back of the drive (see [Figure 4](#)).

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

10. Connect one of the device connectors on the EIDE cable to the 40-pin interface connector on the back of the hard-disk drive.

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.


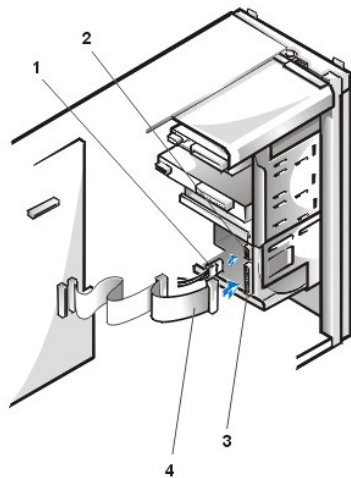
 **NOTE:** Ultra Advanced Technology Attachment (ATA)/66 hard-disk drives require an 80-conductor cable to transfer data at full speed. The 80-conductor cable has a 40-pin connector just like the Ultra ATA/33 cable but has twice as many wires within the cable itself. If you use an Ultra ATA/33 cable with Ultra ATA/66 hard-disk drives, the drives will transfer data at Ultra ATA/33 speeds.

Figure 4. Attaching Hard-Disk Drive Cables in the Mini Tower Chassis



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

11. If it is not already connected, connect the other end of the EIDE cable 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 8](#) in "Inside Your Computer."

12. Replace the front panel.

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

14. If the drive you just installed is the primary drive, insert a bootable diskette into drive A.
 15. Enter System Setup, and update [Primary Drive 0](#) or [Primary Drive 1](#).
After you update the System Setup settings, reboot the system.
 16. Partition and logically format your drive before proceeding to the next step.
See the documentation for your operating system for instructions.
 17. Test the hard-disk drive by running the [Dell Diagnostics](#).
 18. If the drive you just installed is the primary drive, install your operating system on the hard-disk drive.
Refer to the documentation that came with your operating system.
-

Installing an EIDE Hard-Disk Drive in the Desktop Chassis

To install an EIDE hard-disk drive in the desktop chassis, perform the following steps.

⚠ CAUTION: Before you remove the computer cover, see "[Safety First — For You and Your Computer](#)."

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

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

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

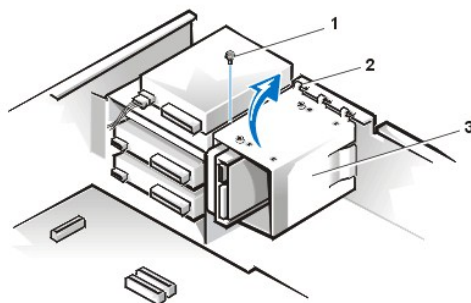
Check the documentation for the drive to verify that it is configured for your computer system.

3. Remove the computer cover as instructed in "[Removing and Replacing the Computer Cover](#)."
4. Remove the drive bracket from the chassis.

If a hard-disk drive is already installed in the drive bracket, disconnect the DC power cable and EIDE cable from the drive.

Remove the screw holding the drive bracket to the drive bay. Lift up on the drive bracket to disengage it from the latch on the drive bay and the three hooks on the front of the chassis (see Figure 5). Remove the bracket.

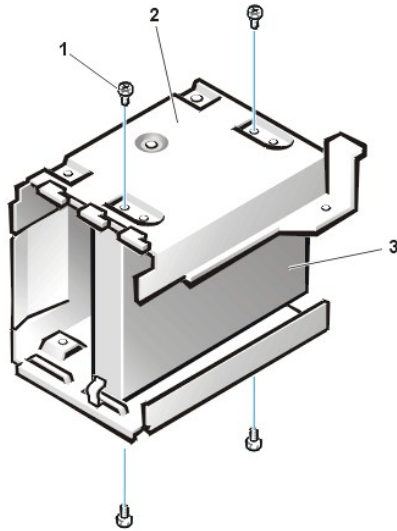
Figure 5. Removing the Hard-Disk Drive Bracket From the Desktop Chassis



- 1 Screw
- 2 Hooks (3)
- 3 Drive bracket

5. Slide the drive into the chosen bay of the bracket, oriented so that the connectors on the back of the drive will face the back of the chassis when the bracket is reinstalled (see [Figure 6](#)).
6. Align the four screw holes of the drive and bracket. Insert and tighten the screws that came with your upgrade kit (see Figure 6).

Figure 6. Inserting a Hard-Disk Drive in the Bracket for the Desktop Chassis

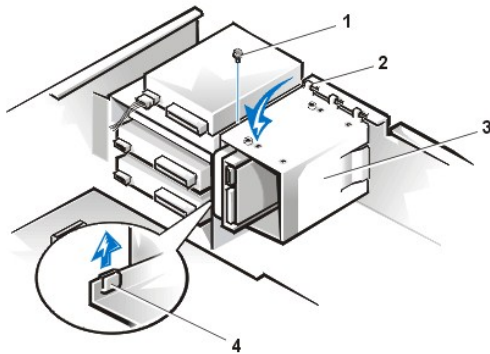


- 1 Screws (4)
- 2 Drive bracket
- 3 Drive

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

Insert the bracket into the chassis by inserting the hooks in the slots on the front of the chassis. Then lower the bracket to the bottom of the chassis, making sure that the latch on the drive bay is engaged. Replace the screw holding the drive bracket to the drive bay.

Figure 7. Inserting the Drive Bracket in the Desktop Chassis



- 1 Screw
- 2 Hooks (3)
- 3 Drive bracket
- 4 Latch

8. Connect a DC power cable to the power input connector on the back of the drive (see [Figure 8](#)).

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

9. Connect one of the device connectors on the EIDE cable to the 40-pin interface connector on the back of the hard-disk drive.

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.


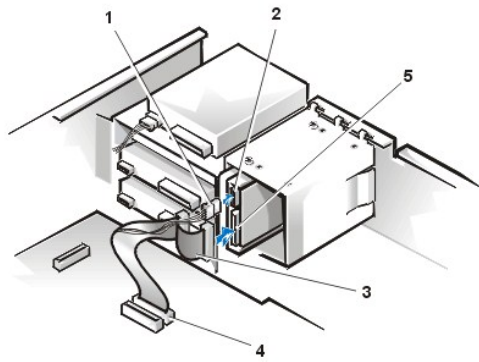
 **NOTE:** Ultra ATA/66 hard-disk drives require an 80-conductor cable to transfer data at full speed. The 80-conductor cable has a 40-pin connector just like the Ultra ATA/33 cable but has twice as many wires within the cable itself. If you use an Ultra ATA/33 cable with Ultra ATA/66 hard-disk drives, the drives will transfer data at Ultra ATA/33 speeds.

Figure 8. Attaching Hard-Disk Drive Cables in the Desktop Chassis



- 1 DC power cable
- 2 Power input connector on drive
- 3 EIDE cable
- 4 IDE1 connector
- 5 Interface connector on drive

10. If it is not already connected, connect the other end of the EIDE cable 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 8](#) in "Inside Your Computer."

11. Replace the computer cover. Then reconnect your computer and peripherals to their power sources, and turn them on.
12. If the drive you just installed is the primary drive, insert a bootable diskette into drive A.
13. Enter System Setup, and update [Primary Drive 0](#) or [Primary Drive 1](#).

After you update the System Setup settings, reboot the system.

14. Partition and logically format your drive before proceeding to the next step.

See the documentation for your operating system for instructions.

15. Test the hard-disk drive by running the [Dell Diagnostics](#).
16. If the drive you just installed is the primary drive, install your operating system on the hard-disk drive.

Refer to the documentation that came with your operating system.

Installing SCSI Devices

This section describes how to configure and install small computer system interface (SCSI) devices in your system. To install a SCSI device, you must have a SCSI controller card installed in your system.

SCSI Configuration Guidelines

Up to two SCSI hard-disk drives can be installed in the hard-disk drive bracket. Although you install SCSI devices essentially the same way as other devices, their configuration requirements are different. For details on configuring your particular SCSI subsystem, refer to the documentation for your SCSI devices and/or your host adapter card. The following subsections offer some general guidelines.




NOTE: Dell does not support mixing SCSI and EIDE hard-disk drives in the same system. If your system contains any EIDE hard-disk drives, do not install SCSI hard-disk drives.

SCSI ID Numbers

Internal SCSI devices must have a unique SCSI ID number from 0 to 15.

When SCSI devices are shipped from Dell, the default SCSI ID numbers for the primary and secondary controllers are assigned as follows:

- 1 SCSI controller: SCSI ID 7
- 1 Boot SCSI hard-disk drive: SCSI ID 0
- 1 SCSI CD-ROM drive: SCSI ID 5
- 1 SCSI tape or digital audio tape (DAT) drive: SCSI ID 6

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

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

If you attach additional optional SCSI devices, refer to the documentation for each device for information about setting the appropriate SCSI ID number.

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

Device Termination

SCSI logic requires that termination be enabled for the two devices at opposite ends of the SCSI chain and disabled for all devices in between.

Dell recommends that you use terminated cables and that you disable termination on all devices. See the documentation provided with any optional SCSI device you purchase for information on disabling termination on the device.

SCSI Cables

Ultra2/Wide low-voltage differential (LVD) devices (hard-disk drives) use a 68-pin cable. One end of this cable should be attached to the SCSI controller card. The remaining connectors on the cable should be attached to the various LVD devices.

Narrow SCSI devices (tape drives, CD-ROM drives, and some hard-disk drives) use a 50-pin cable. One end of this cable should be attached to the SCSI controller card. The remaining connectors on the cable should be attached to the various Narrow SCSI devices.

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

General Procedure for Installing SCSI Devices

Configure and install one or more SCSI devices in your computer as follows:

1. Determine which connector on the internal SCSI cable you will attach to each SCSI device.
2. Unpack each SCSI device and prepare it for installation.

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

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.

Configure the device for a SCSI ID number and disable termination, if necessary.

3. Install the SCSI devices as appropriate.
 - o To install a SCSI hard-disk drive, complete steps 3 through 8 of "[Installing an EIDE Hard-Disk Drive in the Mini Tower Chassis](#)" or steps 3 through 7 of "[Installing an EIDE Hard-Disk Drive in the Desktop Chassis](#)." Then continue with step 4 of this procedure.
 - o To install a SCSI tape drive, CD-ROM drive, or DAT drive, complete installation steps 3 through 7 for a mini tower chassis (see "[Installing a CD-ROM, Tape, DVD, or Zip Drive in a Mini Tower Chassis](#)") or steps 3 through 6 for a desktop chassis (see "[Installing a CD-ROM, Tape, DVD, or Zip Drive in a Desktop Chassis](#)"). Then continue with step 4 of this procedure.
 - o To install an external SCSI device, continue with step 4 of this procedure.
 - o 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 8](#) in "Inside Your Computer").
4. Attach the SCSI cable to each SCSI 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 LVD 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.

5. Connect the SCSI device(s) to power.
 - o If you are installing an internal SCSI device, connect a DC power cable to the power input connector on the SCSI device.
 - o 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.

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

6. If you installed an externally accessible device, remove the front-panel insert for the drive bay.

For a mini tower chassis, you must first remove the front panel as described in "[Removing and Replacing the Front Panel](#)." To remove a front-panel insert, hold the front panel (mini tower chassis) or computer cover (desktop chassis) with the inside facing toward you and press each end of the insert with your thumbs until it snaps free of the front panel or computer cover. If you have a mini tower chassis, replace the front panel.


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

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

ALERT! Cover was previously removed.

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

See "[Chassis Intrusion](#)" for instructions.

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

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

After installing a SCSI hard-disk drive, **Primary Drive 0** and **Primary Drive 1** should be set to **None**. If you have any EIDE devices on the second EIDE channel, such as a CD-ROM or tape drive, **Secondary Drive 0** and/or **Secondary Drive 1** should be set to **Auto**. If you have any SCSI devices on the second EIDE channel, **Secondary Drive 0** and/or **Secondary Drive 1** should be set to **None**.

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

For instructions, see "[Partitioning and Formatting SCSI Hard-Disk Drives](#)" and your operating system documentation.

11. Test the SCSI devices.

Test a SCSI hard-disk drive by running the [Dell Diagnostics](#).

To test a SCSI tape drive, refer to the documentation for the tape drive software to perform a tape drive backup and verification test.

Partitioning and Formatting SCSI Hard-Disk Drives

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.

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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:

- 1 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)

- 1 Anonymous file transfer protocol (FTP)

<ftp.dell.com/>

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

- 1 Electronic Support Service

support@us.dell.com

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

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

1 Electronic Quote Service

sales@dell.com

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

1 Electronic Information Service

info@dell.com

AutoTech Service

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

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

The AutoTech service is available 24 hours a day, seven days a week. You can also access this service through the technical support service. For the telephone number to call, see 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.

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 see 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:
See 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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Inside Your Computer: Dell Precision™ WorkStation 220 System User's Guide

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| Safety First—For You and Your Computer | System Board Labels |
| Removing and Replacing the Computer Cover | Removing and Replacing the AGP Card Brace (Mini Tower Chassis Only) |
| Internal Views | Rotating the Power Supply Away From the System Board |
| System Board Components | Removing and Replacing the Front Bezel |
-

Overview

This section describes the inside of your computer and may be used as a reference before performing an upgrade procedure.

 **CAUTION:** Before working inside your computer, see "[Safety First—For You and Your Computer](#)."

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 in the sequence indicated:

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 lines 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 8](#).

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

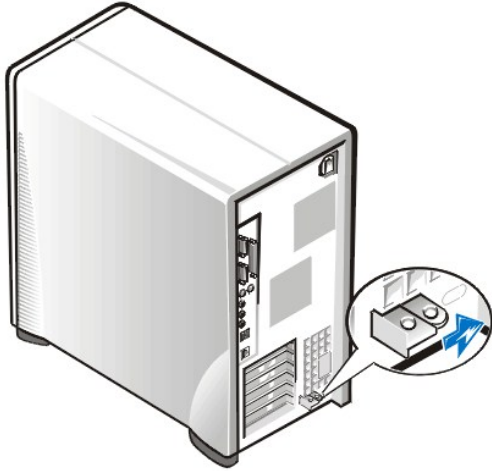
To remove the computer cover, perform the following steps:

1. Turn off your computer and peripherals, and observe the *Caution for Your Personal Safety and Protection of the Equipment* described in "[Safety First—For You and Your Computer](#)."
2. If you have installed a padlock through the [padlock ring](#) on the back panel, remove the padlock.
3. Remove the computer cover.

If your computer is a mini tower chassis, perform the following steps:

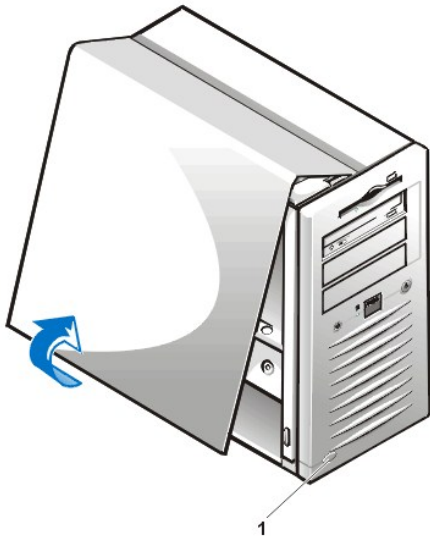
- a. Face the back of the computer and slide the upper half of the padlock ring to the left to unlock the cover release mechanism (see [Figure 1](#)).

Figure 1. Mini Tower Chassis Cover Release Mechanism



- b. Face the left side cover and press the left-cover release button (located at the bottom-left corner of the front panel) (see [Figure 2](#)).
- c. Lift the bottom of the cover, allowing it to pivot up toward you, and lift the cover away.
- d. Turn the computer on its side before you begin working inside the chassis.

Figure 2. Mini Tower Chassis Cover Removal

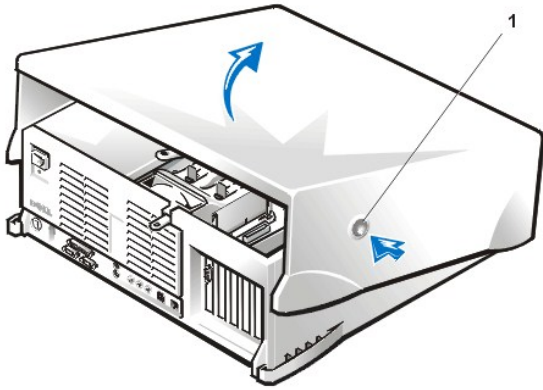


1 Release button

If your computer is a desktop chassis, perform the following steps:

- a. Press in on the two securing buttons until the cover is free to swing up (see [Figure 3](#)).
- b. Raise the back of the cover, pivot it toward the front of the computer, and lift the cover away.

Figure 3. Desktop Chassis Cover Removal



1 Securing buttons (2)

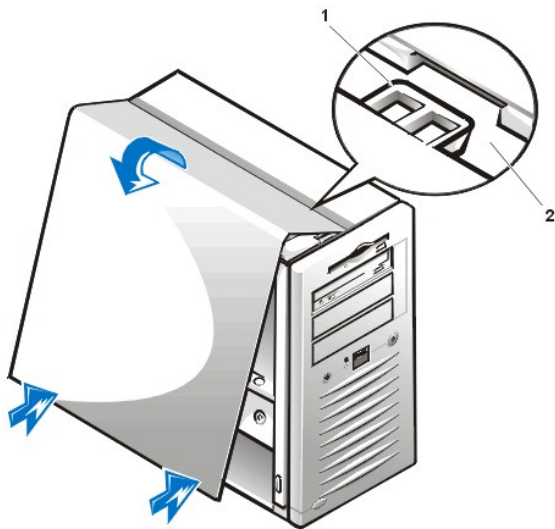
To replace the computer cover, perform the following steps:

1. Check all cable connections, especially those that might have come loose during your work. Fold cables out of the way so that they do not catch on the computer cover. Make sure cables are not routed over the drive 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. Replace the computer cover.

If your computer is a mini tower chassis, perform the following steps:

- a. Face the left side of the computer and hold the cover at a slight angle as shown in [Figure 4](#). While aligning the top of the cover with the top of the chassis, insert the three hooks on the cover into the three recessed slots on the computer chassis.
- b. Pivot the cover down toward the bottom of the chassis and into position. With both hands, press against the bottom edge of the cover to make sure that the securing hooks at the bottom of the cover click into place (see [Figure 4](#)).
- c. Slide the two halves of the padlock ring together to lock the cover release mechanism.

Figure 4. Replacing the Mini Tower Computer Cover

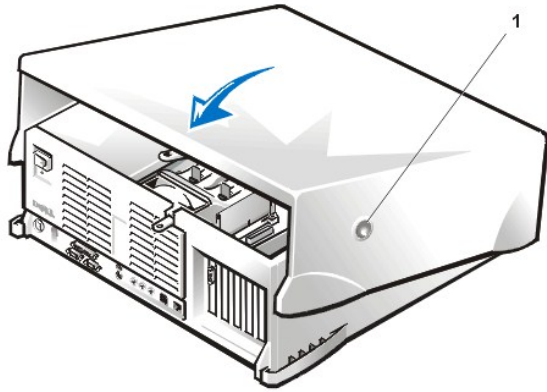


1 Hook
2 Recessed slot

If your computer is a desktop chassis, perform the following steps:

- a. Facing the left side of the computer, hold the cover at a slight angle as shown in [Figure 5](#).
- b. Fit the three cover hooks into the rectangular slots on the chassis. (It might be helpful to look down into the chassis to verify that the hooks are in place.)
- c. Pivot the cover down toward the back and into position. Make sure that the two securing buttons click into place.

Figure 5. Replacing the Desktop Computer Cover



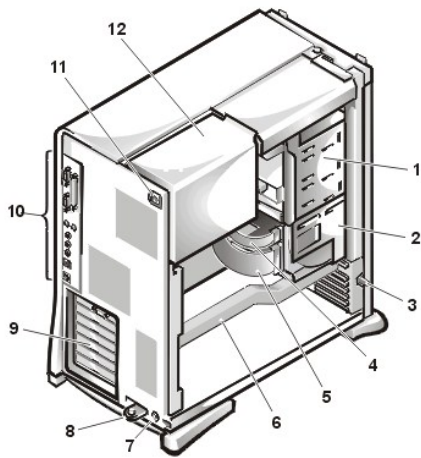
1 Securing buttons (2)

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

Internal Views

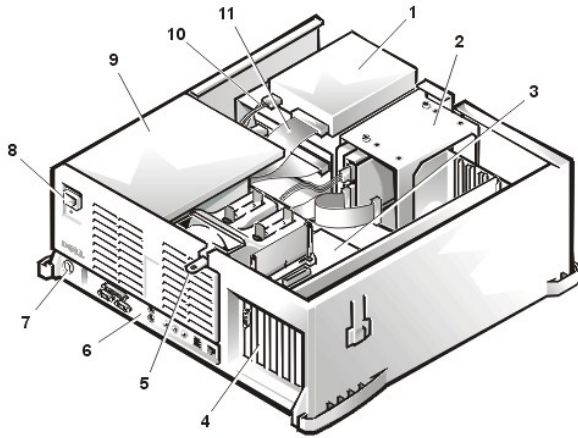
[Figure 6](#) and [Figure 7](#) show your computer with its cover removed.

Figure 6. Inside the Mini Tower Chassis



- 1 Externally accessible drive bays
- 2 Hard-disk drive cage
- 3 Chassis intrusion switch
- 4 DC power cable
- 5 Drive interface cable
- 6 AGP card brace
- 7 Security cable slot
- 8 Padlock ring
- 9 Expansion card slots
- 10 [I/O panel connectors](#)
- 11 AC power receptacle
- 12 Power supply

Figure 7. Inside the Desktop Chassis

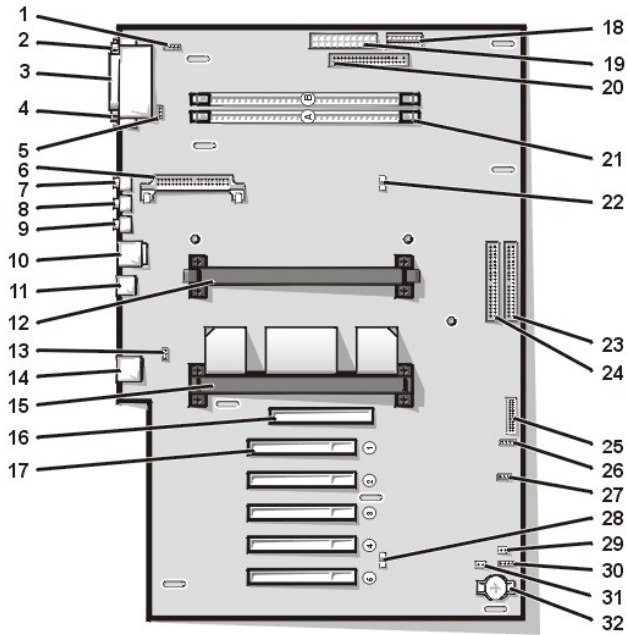


- 1 Externally accessible drive bays
- 2 Hard-disk drive cage
- 3 System board
- 4 Expansion card slots
- 5 Padlock ring
- 6 [I/O panel connectors](#)
- 7 Security cable slot
- 8 AC power receptacle
- 9 Power supply
- 10 DC power cable
- 11 Drive interface cable

System Board Components

Figure 8 shows the system board and the location of all its sockets and connectors.

Figure 8. System Board Components



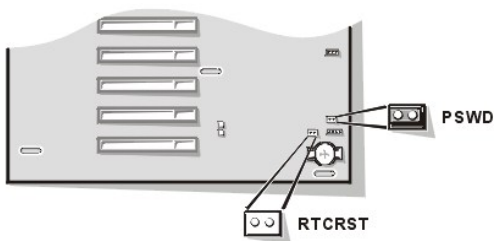
- 1 CD-ROM drive audio interface connector
- 2 Serial port 1 connector
- 3 Parallel port connector
- 4 Serial port 2 connector
- 5 Fan connector
- 6 VRM connector
- 7 Microphone connector
- 8 Line-out connector

- 9 Line-in connector
- 10 Keyboard and mouse connectors
- 11 USB connectors
- 12 Secondary processor (PROC1) connector
- 13 Telephony connector
- 14 NIC connector
- 15 Primary processor (PROC0) connector
- 16 AGP connector
- 17 PCI expansion card connectors (5)
- 18 3.3-V power connector
- 19 Power connector
- 20 Diskette-drive interface connector
- 21 RIMM sockets (2)
- 22 Suspend-to-RAM LED
- 23 Primary EIDE interface connector
- 24 Secondary EIDE interface connector
- 25 Control panel connector
- 26 External speaker connector
- 27 Remote Wakeup power connector
- 28 Standby power LED
- 29 Password jumper
- 30 Auxiliary hard-disk drive access indicator connector
- 31 RTCRST jumper
- 32 Battery socket

System Board Jumpers

Figure 9 shows the location of the jumpers on the system board. [Table 1](#) lists the system board jumpers and their settings.

Figure 9. System Board Jumpers








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

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

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

Table 1. System-Board Jumper Settings

Jumper	Setting	Description
PSWD	 (default)	Password features are enabled.

		Password features are disabled.
RTCST		Real-time clock reset. Can be used for troubleshooting purposes .
 <i>jumpered</i>  <i>unjumpered</i>		

System Board Labels


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

Table 2. System Board Connectors and Sockets

Connector or Socket	Description
AUX_LED	Hard-disk drive LED connector
BATTERY	Battery socket
CD_IN	CD-ROM audio interface connector
RIMM_x	RIMM socket
DSKT	Diskette/tape drive interface connector
ENET	Integrated NIC connector
EXT_SPKR	External speaker connector
FAN	Microprocessor fan connector
IDE _n	EIDE interface connector
INTRUSION	Chassis intrusion switch connector
KYBD	Keyboard connector
MONITOR	Video connector
MOUSE	Mouse connector
PANEL	Control panel connector
PAR	Parallel port connector; sometimes referred to as <i>LPT1</i>
PCIn	PCI expansion-card connector
POWER_1	Main power input connector
POWER_2	3.3-V power input connector
PROC_0	Primary microprocessor connector
PROC_1	Secondary microprocessor connector
SER	Serial port connectors
STANDBY	Standby power LED
STR	Suspend-to-RAM LED
USB	USB connectors
TAPI	Telephony connector
WUOL	Remote Wakeup power connector

Removing and Replacing the AGP Card Brace (Mini Tower Chassis Only)

To access some components on the system board in the mini tower chassis, you may need to first remove the accelerated graphics port (AGP) card brace that secures an AGP card in the AGP socket.

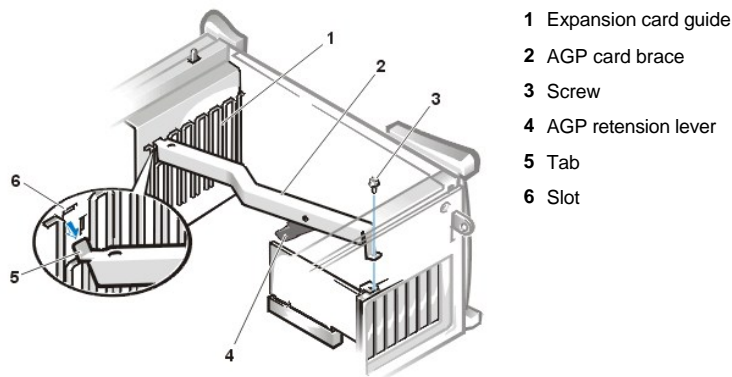
 **NOTE:** Your computer has either an AGP card or an [AGP card clip](#).

 **CAUTION:** Before you remove the computer cover, see "[Safety First—For You and Your Computer](#)."

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

2. Remove the screw securing the AGP card brace to the chassis (see Figure 10).

Figure 10. Removing the AGP Card Brace



3. Rotate the brace up until it disengages from the card guide at the front of the chassis. Then lift it away from the chassis.

To replace the brace, perform the following steps:

1. Insert the tabs on one end of the brace into the slots on the card guide at the front of the chassis (see [Figure 10](#)).
2. Lower the brace, ensuring that the AGP retention lever on the bottom of the brace is aligned with the top of the AGP card.
3. Replace the screw that secures the brace to the chassis.

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:

⚠ CAUTION: Before you remove the computer cover, see "[Safety First—For You and Your Computer.](#)"

1. Remove the computer cover as instructed in "[Removing the Computer Cover.](#)"
2. Disconnect the AC power cable from the AC power receptacle on the back of the power supply (see [Figure 11](#) or [Figure 12](#)).

Figure 11. Rotating the Power Supply in a Mini Tower Chassis

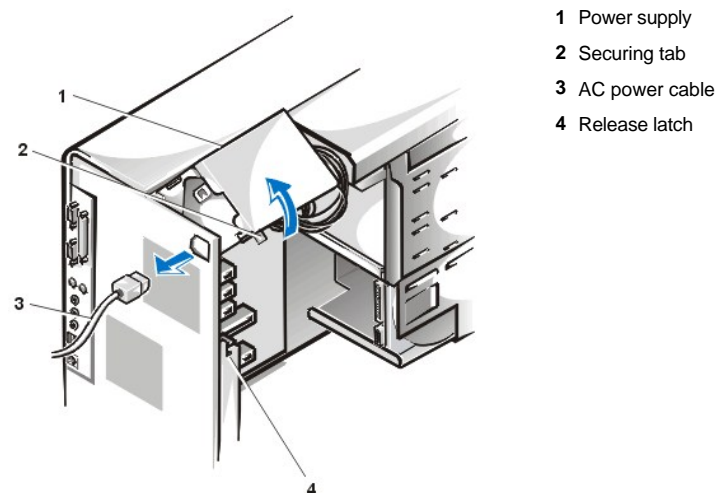
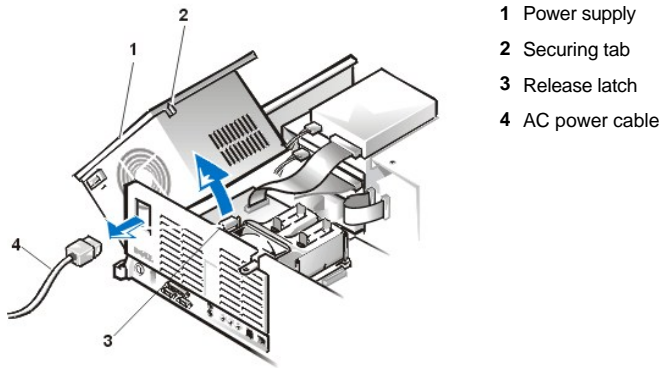


Figure 12. Rotating the Power Supply in a Desktop Chassis



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

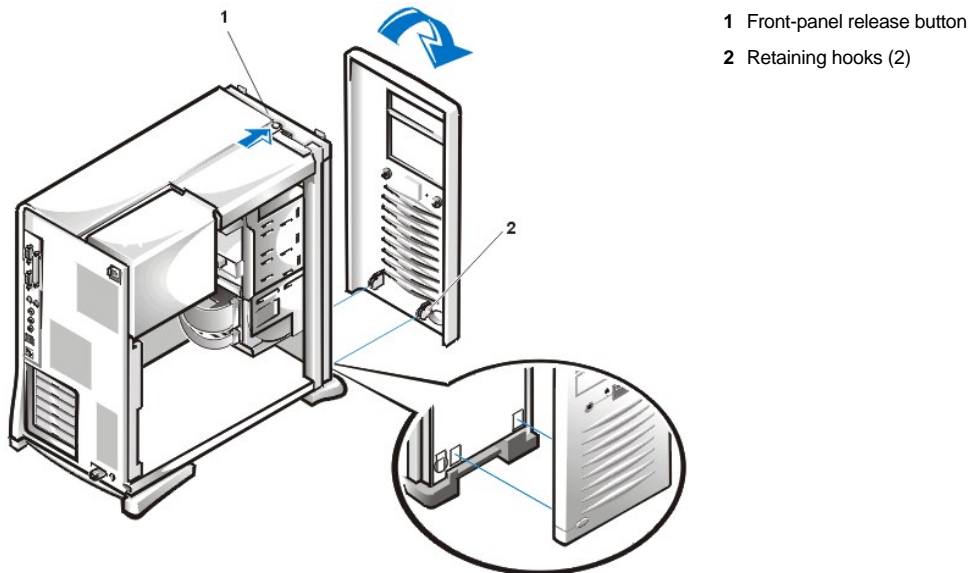
3. Free the power supply from the securing tab by pressing the latch labeled "RELEASE ->." Then rotate the power supply upward until it locks in its extended position.

When you have finished accessing components on the system board, rotate the power supply back to its original position until the release latch snaps into the securing tab.

Removing and Replacing the Front Panel (Mini Tower Chassis Only)

To access drive bays in the mini tower chassis, you must first remove the front panel. To remove the front panel, you first must remove the computer cover (see "[Removing and Replacing the Computer Cover](#)"). With the cover removed, release the front panel by pressing the green front-panel release button marked with the icon (see Figure 13).

Figure 13. Removing the Front Panel



- 1 Front-panel release button
- 2 Retaining hooks (2)

While pressing the front-panel release button, tilt the front panel away from the chassis, disengage the two retaining hooks at the bottom of the panel, and carefully pull the panel away from the chassis.

To replace the front panel, fit the two retaining hooks on the panel into their corresponding slots at the bottom of the chassis (see [Figure 13](#)). Then rotate the top of the panel toward the chassis until the top tabs snap into their corresponding slots on the panel.

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 [Microprocessor](#)

 [Battery](#)

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Internal Components: Dell Precision™ WorkStation 220 System User's Guide

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- [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:

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

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

- 1 A copy of the *Dell Precision ResourceCD*
- 1 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](#) and [Figure 2](#) for the location of this label on the mini tower and desktop chassis, respectively). Refer to this label for the location of system board components and connectors while troubleshooting your system.

Figure 1. Mini Tower Chassis Interior Service Label

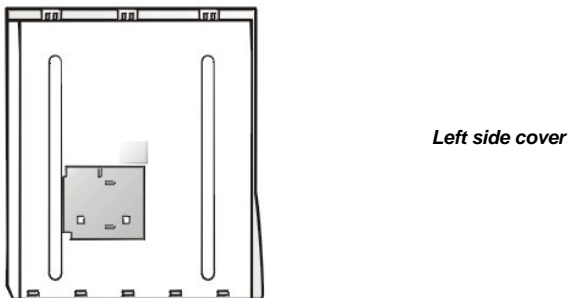
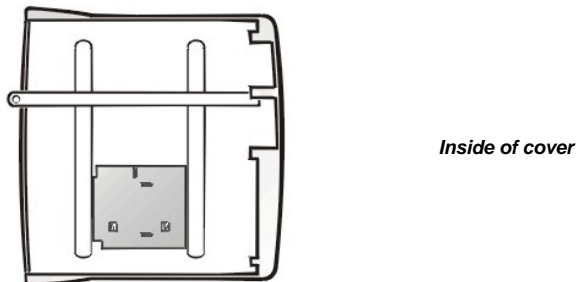


Figure 2. Desktop Chassis Interior Service Label



Troubleshooting a Wet Computer

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 lines 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. If you have a mini tower chassis, 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. If you have a mini tower chassis, replace the AGP card brace.
9. Replace the computer cover, and reconnect the system to an electrical outlet. Also, reconnect any telephone or telecommunication lines 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

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 lines 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, and reseal any loose expansion cards.
4. Verify the diskette/tape drive, hard-disk drive, and all other internal connections.

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

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 lines from the computer.

 **CAUTION:** Before you remove the computer cover, see "[Safety First—For You and Your Computer.](#)"

2. [Remove the computer cover.](#)
3. If you have a mini tower chassis, remove the AGP card brace according to the instructions in "[Removing and Replacing the AGP Card Brace.](#)"
4. Reseat the battery in its socket with the side labeled "+" facing up.

The battery is a coin cell that snaps into a socket on the system board.

5. If the problem is not resolved, replace the 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

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 lines from the computer.

 **CAUTION:** Before you remove the computer cover, see "[Safety First—For You and Your Computer.](#)"

2. [Remove the computer cover.](#)
3. Verify that each expansion card is firmly seated in its connector. If any expansion cards are loose, reseat them.
4. 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.

5. [Remove all expansion cards](#) except the video card.
6. [Replace the computer cover](#), reconnect the system to an electrical outlet, and turn it on.
7. 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 8. If any of the tests fail, see "[Getting Help](#)" for information on obtaining technical assistance.

8. Turn off the system, disconnect it from the electrical outlet, and remove the computer cover.
9. 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.

10. 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

A computer memory problem can be a faulty Rambus in-line memory module (RIMM) 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 RIMM in socket A. 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, and reseat the RIMMs in their sockets.

To reseat a RIMM, you need to [rotate the power supply](#) out of the way.

3. 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 RIMM, [replace that RIMM](#). 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

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

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, see your video card documentation for further troubleshooting instructions.

If any of the tests fail, see "[Getting Help](#)" for instructions on obtaining technical assistance.

Troubleshooting the System Board

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

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 lines 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 power cables from the power supply are firmly connected to the connectors on 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. Perform the procedure in "[Troubleshooting Expansion Cards.](#)" If the problem is not resolved, proceed to step 7.
7. Perform the procedure in "[Troubleshooting the Keyboard.](#)"
8. Perform the procedure in "[Troubleshooting a Dead System Board With the RTCRST Jumper.](#)"
9. 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

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 lines from the computer.

 **CAUTION:** Before you remove the computer cover, see "[Safety First—For You and Your Computer.](#)"

2. [Remove the computer cover.](#)
 3. If you have a mini tower chassis, 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 AGP card brace, [replace the computer cover](#), reconnect the system to an electrical outlet, and turn on the system. If the problem is not resolved, see "[Getting Help](#)" for instructions on obtaining technical assistance.
-

Troubleshooting Drives

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 lines 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 220 System User's Guide

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Overview

Dell Precision WorkStation 220 systems are high-performance, expandable workstation computers designed to optimize the Intel® Pentium® III architecture. The Dell Precision 220 workstation provides a uniquely tuned environment that balances processing, memory, graphics, and storage for optimal performance in demanding 2-dimensional (2D), mainstream 3-dimensional (3D), or data-intensive applications.

Hardware Features

Your system offers the following features:


- 1 Up to two Intel Pentium III microprocessors.
- 1 System memory that can be increased up to 1 gigabyte (GB) by installing Rambus dynamic random-access memory (RDRAM) Rambus in-line memory modules (RIMMs) in the RIMM sockets on the system board. See "[System Memory](#)" for details.

 *NOTE: To reach the maximum 1-GB memory total, you must install two 512-megabyte (MB) RIMMs (when available) that each have a maximum of 16 memory devices. The system supports no more than a total of 32 memory devices on all installed RIMMs. See [Figure 1](#) in "System Memory" for the location of a label on the RIMM that identifies the number of memory devices it contains.*

- 1 An accelerated graphics port (AGP) 4X graphics card with up to 32 MB of synchronous DRAM (SDRAM) or synchronous graphics RAM (SGRAM) video memory. See your graphics card documentation for further details.
- 1 An integrated Analog Devices AD1881 AC97 Codec audio controller that provides Sound Blaster emulation and 16-bit analog-to-digital and digital-to-analog stereo conversion.
- 1 Self-Monitoring and Analysis Reporting Technology II (SMART II) support, which warns you at system start-up if your enhanced integrated drive electronics (EIDE) hard-disk drive has become unreliable.

EIDE hard-disk drives shipped with Dell Precision 220 systems are SMART II-compliant.

- 1 Ultra Advanced Technology Attachment (ATA)/66 support, which allows EIDE ATA-compatible fixed-disk storage devices to transfer data at speeds up to 66 MB per second (MB/sec).
- 1 Full compliance with Peripheral Component Interconnect (PCI) specification 2.2.

 *NOTE: To meet PC99 Workstation requirements, your Dell system uses only PCI expansion slots. Industry-Standard Architecture (ISA) expansion cards are not supported.*


- 1 Full compliance with Advanced Configuration and Power Interface (ACPI) specification 1.0A.
- 1 [Remote Wake Up](#) capability for both integrated network interface controllers (NICs) and optional NIC expansion cards. When the **Remote Wake Up** option is enabled in embedded [System Setup](#), the system can be powered up remotely from a server management console.

Remote Wake Up capability also allows remote computer setup, software downloading and installation, file updates, and asset tracking after business hours and on weekends when network traffic is at a minimum.
- 1 Managed boot agent (MBA), which allows the system to boot from one of four network preboot environment protocols: Preboot eXecution Environment (PXE), Remote Program Load (RPL), BootP, or Novell® NetWare® Remote Boot.
- 1 Remote system alerts, which allow the system to transmit special predetermined network messages regarding its operating condition.
- 1 Universal Serial Bus (USB) capability, which can simplify connecting peripheral devices such as mice, printers, and computer speakers. The system basic input/output system (BIOS) supports USB keyboards and mice in MS-DOS® and other non-Windows® environments.
- 1 Dell Precision mini tower or desktop chassis for easy service, upgradability, or parts replacement.

For additional hardware features, see "[Specifications](#)."

Software Features

The following software is included with your Dell computer system:

 **NOTE:** Backup copies of all drivers for your system are included on the Dell Precision ResourceCD. If you need to reinstall any of these drivers, see the documentation that accompanied the CD.

- 1 A BIOS that resides in flash memory and can be upgraded by diskette, or remotely over a network, if required.
- 1 Highly optimized 2D and OpenGL 3D graphics drivers designed to accelerate major graphics-intensive applications. See your graphics card documentation for further details.
- 1 Audio drivers for enabling the sound functions of the integrated audio controller.
- 1 Bus-mastering EIDE drivers to improve performance by off-loading certain functions from the microprocessor during multithreaded operation (when several applications are running simultaneously).
- 1 Embedded [System Setup](#) for quickly viewing and changing the system configuration. System Setup also provides several [enhanced security features](#) (a setup password, a system password, a system-password lock option, a write-protect option for diskette drives, chassis intrusion detection, and display of the system's service tag number).
- 1 [Dell Diagnostics](#) for evaluating the computer's components and devices.
- 1 Network device drivers for several operating systems.
- 1 Desktop Management Interface (DMI) support, which enables the remote management of your computer system's software and hardware.
- 1 Support for [Dell OpenManage™ IT Assistant](#).

Manageability Features

Dell offers the following manageability components for use with your Dell Precision 220 system:

- 1 [Dell OpenManage IT Assistant](#)
- 1 [MBA](#)
- 1 [Remote Wake Up](#)
- 1 [Remote System Alert](#)
- 1 [Auto Power On](#)
- 1 [Chassis intrusion alerts](#)
- 1 [Temperature and voltage monitoring](#)
- 1 [Common Information Model \(CIM\) support](#)
- 1 [Configuration change alerts](#)
- 1 [Asset Info with support for the cost of ownership \(COO\) Management Information Format \(MIF\) standard](#)
- 1 [Remote BIOS flash](#)
- 1 [Remote system configuration](#)
- 1 [Prefailure alerts](#)

Dell OpenManage IT Assistant

The Dell OpenManage IT Assistant program is the Dell software-management application interface for DMI. It allows you to manage system-level information, such as system configuration information and MIF database values.

Fault management features of the Dell OpenManage IT Assistant include:

- 1 Alerts to warn you about events generated by SMART drives on a local or remote system
- 1 Thermal monitoring to notify you if the system becomes overheated.

- 1 An event log that stores events in a text file and reports the following information about events: **System Name, Component Name, Date and Time, Event Type, Event Severity, Event Class, and Event System**

Configuration management features of the Dell OpenManage IT Assistant program include:

- 1 Remote Wake Up support, which allows network administrators to remotely turn on Managed PC systems with Remote Wake Up capability in a Dell DMI network
- 1 A **System Properties** window that enables network administrators to view, set, or disable certain hardware configuration settings for the local and remote systems in a Dell DMI network
- 1 Support for the Microsoft® System Management Server (SMS), which allows the exporting of one or more groups to an SMS directory that the SMS administrator can access
- 1 A monitor component for systems running Windows 98 and having a display data channel (DDC)-compliant video subsystem and monitor
- 1 Automated inventory control of one or more groups for the remote systems in a Dell DMI network

Network administrators can automate inventory to occur every day, week, or month at a certain hour, on the hour; or you can enable inventory as needed. The Dell OpenManage IT Assistant program creates a text file for the group(s) and saves it to a user-defined directory.

- 1 Support for the application program used to create user-definable attributes (UDAs)

Asset management features of the Dell OpenManage IT Assistant include:

- 1 Support that enables network administrators to remotely view, enter, and modify an asset tag for a remote system in a Dell DMI network
- 1 Automated and manual mapping of one or more groups to a user-defined directory

Security management features of the Dell OpenManage IT Assistant include password security that enables network administrators to maintain standard attribute values for the local and remote systems in a Dell DMI network.

For more information about the Dell OpenManage IT Assistant, see the online Dell OpenManage IT Assistant documentation that accompanied the software.

MBA


The 3Com® MBA supports multiple preboot environments and allows network administrators to boot the system from a network server.

See "[Network Interface Controller](#)" for more information about MBA.

Remote Wake Up

Remote Wake Up allows you to remotely turn on a Managed PC system that is either in a sleep state or turned off. The ability to turn on Managed PC systems remotely allows you to perform remote computer setup, software downloading and installation, file updates, and asset tracking at any time.


To use the Remote Wake Up feature, each Managed PC system must contain a NIC that supports Remote Wake Up. You must also enable the **Remote Wake Up** option in [System Setup](#).

 **NOTE:** This feature does not work if the system is shut off using a power strip or surge protector.

Remote System Alert

Remote System Alert allows you to receive certain predetermined messages from the system about its operating condition. For example, the system can transmit an alert if the computer cover is removed.

To use the Remote System Alert feature, each Managed PC system must contain an integrated NIC that supports Remote System Alert.

 **NOTE:** This feature does not work if the system is shut off using a power strip or surge protector.

Auto Power On

Auto Power On enables you to turn on the computer system automatically on certain days of the week at a preset time. 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 the system is shut off using a power strip or surge protector.

Chassis Intrusion Alerts

Chassis intrusion alerts notify you if a local or remote system's chassis has been opened.

Temperature and Voltage Monitoring

Your system includes temperature and voltage probes to sense when the system becomes overheated or the power supply voltage is out of range. In either case, a message appears on the screen when Dell OpenManage IT Assistant is running or at the next system start-up notifying you of the problem.

CIM Support

CIM allows you to access system management information if your system is running Microsoft Windows 98 or any other Windows operating system that includes the Web-Based Enterprise Management (WBEM) core components. For information about the WBEM core components and how to install them, see the Microsoft World Wide Web site at <http://www.microsoft.com>.

Configuration Change Alerts

Configuration change alerts generate warning messages if a local or remote system has a change in hardware configuration.

Asset Info With Support for the COO MIF Standard

Asset Info uses the nonproprietary DMI standard to allow you to record and track costs related to your system. The cost-related information is stored in the **coo.mif** file on your system's hard-disk drive.

Remote BIOS Flash

Remote BIOS flash allows a network administrator to perform remote BIOS upgrades to systems on a network.

Remote System Configuration


Remote system configuration features allow a network administrator to change the system asset tag, boot sequence, property ownership tag, and System Setup settings and to update the system BIOS.

Prefailure Alerts

Prefailure alerts generate warning messages about potential failures by SMART II hard-disk drives.

ENERGY STAR® Compliance

Certain configurations of Dell computer systems comply with the requirements set forth by the Environmental Protection Agency (EPA) for energy-efficient computers. If the front panel of your computer bears the ENERGY STAR® Emblem (see Figure 1), your original configuration complies with these requirements and all ENERGY STAR® power management features of the computer are enabled.

 **NOTES:** As an ENERGY STAR® Partner, Dell Computer Corporation has determined that this product meets the ENERGY STAR® guidelines for energy efficiency.

Any Dell computer bearing the ENERGY STAR® Emblem is certified to comply with EPA ENERGY STAR® requirements as configured when shipped by Dell. Any changes you make to this configuration (such as installing additional expansion cards or drives) may increase the system's power consumption beyond the limits set by the EPA's ENERGY STAR® Computers program.

Figure 1. ENERGY STAR® Emblem



The EPA's ENERGY STAR® Computers program is a joint effort between the EPA and computer manufacturers to reduce air pollution by promoting energy-efficient computer products. The EPA estimates that use of ENERGY STAR® computer products can save computer users up to two billion dollars annually in electricity costs. In turn, this reduction in electricity usage can reduce emissions of carbon dioxide, the gas primarily responsible for the greenhouse effect, and sulfur dioxide and nitrogen oxides, which are the two primary causes of acid rain.

Computer users can also help to reduce electricity usage and its side effects by turning off their computer systems when they are not in use for extended periods of time—particularly at night and on weekends.

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System Memory: Dell Precision™ WorkStation 220 System User's Guide


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Overview

You can increase system memory up to 1 gigabyte (GB) by using Rambus dynamic random-access memory (RDRAM) Rambus in-line memory modules (RIMMs). [Figure 8](#) in "Inside Your Computer" shows the location of the RIMM sockets on the system board. Sockets that do not contain a RIMM must contain a Rambus continuity module (RCM).

 **NOTES:** To reach the maximum 1-GB memory total, you must install two 512-megabyte (MB) RIMMs (when available) that each have a maximum of 16 memory devices. The system supports no more than a total of 32 memory devices on all installed RIMMs. See [Figure 1](#) for the location of a label on the RIMM that identifies the number of memory devices it contains. You can also determine the number of memory devices installed through the [System Memory](#) option in System Setup.


The system does **not** support RIMMs with six memory devices.

All RIMM sockets must be occupied either by a RIMM or an RCM.

Figure 1. RIMM Label Showing Number of Memory Devices





For optimum operation, Dell recommends that you install a RIMM in socket A first (closest to the processor) before installing a RIMM in socket B. If you are installing RIMMs with different memory sizes, insert the RIMM with the higher memory size in socket A, and insert the RIMM with the lower memory size in socket B. For the location of sockets A and B, see [Figure 8](#) in "Inside Your 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 8](#) in "Inside Your Computer."

Installing RIMMs


To upgrade memory, perform the following steps.

 **CAUTION:** To avoid the possibility of electric shock, turn off the computer and any peripherals, disconnect them from their electrical outlets, and then wait at least 5 seconds before you remove the computer cover. Verify that the standby power light-emitting diode (LED) on the system board is off. Also, before you upgrade memory, see the other precautions in "[Safety First—For You and Your Computer](#)."

 **CAUTION:** RIMMs can get extremely hot during system operation. Be sure that the RIMMs have had sufficient time to cool before you touch them.

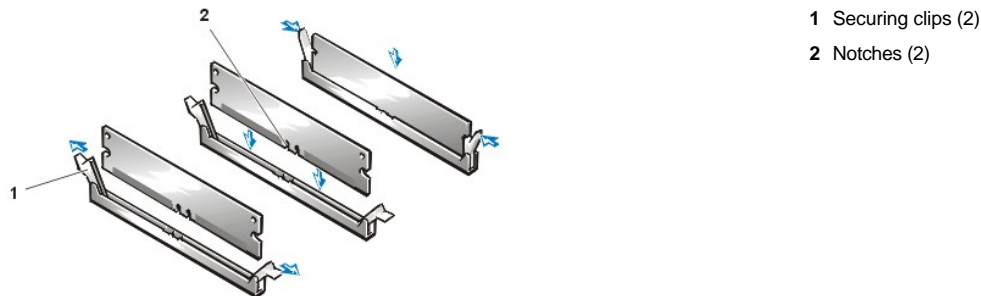
NOTICE: Before you upgrade the RIMMs, you must perform the steps under [BIOS Recovery Utility](#).

1. Remove the computer cover according to the instructions in "[Removing and Replacing the Computer Cover](#)."
2. Rotate the power supply as described in "[Rotating the Power Supply Away From the System Board](#)."
3. [Remove any modules](#) (RCMs or RIMMs) that occupy sockets in which you plan to install the upgrade RIMMs.


 **NOTE:** The system supports no more than a total of 32 memory devices on all installed RIMMs. See [Figure 1](#) for the location of a label on the RIMM that identifies the number of memory devices it contains. You can also determine the number of memory devices installed through the [System Memory](#) option in System Setup.

4. Install the upgrade RIMMs.
 - a. Locate the plastic securing clips at each end of the socket (see [Figure 2](#)).
 - b. Press the clips outward until they snap open.
 - c. Press the RIMM straight into the slot running down the center of the socket until the securing tabs snap into place around the ends of the RIMM.

Figure 2. Installing a RIMM



5. Rotate the power supply back into position, making sure that the securing tab snaps into place.
6. Replace the computer cover, and reconnect your computer and peripherals to their electrical outlets and turn them on.

 **NOTE:** After you remove and replace the cover, the chassis intrusion detector causes the following message to appear on the screen at the next system start-up:


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

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

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

7. Press <F2> to enter [System Setup](#), and check the value for [System Memory](#).

The system should have already changed the value of **System Memory** to reflect the newly installed memory. Verify the new total. If it is correct, skip to [step 9](#).
8. If the memory total is incorrect, turn off and disconnect your computer and peripherals from their electrical outlets. Remove the computer cover, rotate the power supply, and check the installed RIMMs to make sure that they are seated properly in their sockets. Then repeat [steps 4, 5, 6, and 7](#).
9. Reset the chassis intrusion detector by selecting **System Security** and changing [Chassis Intrusion](#) to **Enabled** or **Enabled-Silent**.

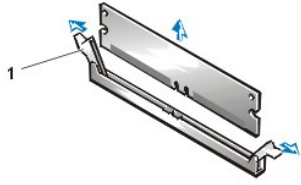
 **NOTE:** If a setup password has been assigned by someone else, contact your network administrator for information on resetting the chassis intrusion detector.
10. When the **System Memory** total is correct, press <Esc> to exit System Setup.
11. Run the [Dell Diagnostics](#) to verify that the RIMMs are operating properly.

Removing Modules

NOTICE: Before you upgrade the RIMMs, you must perform the steps under [BIOS Recovery Utility](#).

To remove a module (RCM or RIMM), press the securing clips outward simultaneously until the module disengages and pops out slightly from the socket (see [Figure 3](#)). If you remove an RCM or RIMM, you must install another RCM or RIMM in the empty socket before turning on the computer.

Figure 3. Removing a Module



1 Securing clips (2)

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Messages and Codes: Dell Precision™ WorkStation 220 System User's Guide

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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 basic input/output system (BIOS) found a faulty disk sector or could not find a particular disk sector.	See " Troubleshooting Drives. "
Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support.	The system has failed to complete the boot routine three consecutive times for the same error.	See " Getting Help " for instructions on obtaining technical assistance, and report the checkpoint code (nnnn) to the support technician.
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 the Microsoft® Windows® operating system 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 Rambus in-line memory modules (RIMMs) may be faulty or improperly seated.	See " Troubleshooting System Memory. "
Diskette drive 0 seek failure	A cable may be loose, or the	See " Troubleshooting Drives. "

Diskette drive 1 seek failure	system configuration information may not match the hardware configuration.	
Diskette read failure	A cable may be loose, or the diskette may be faulty.	See " Troubleshooting Drives. "
Diskette subsystem reset failed	The diskette drive controller may be faulty.	Run the Diskette tests in the Dell Diagnostics.
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.
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.
Error! The previous boot failed to complete. Last reported checkpoint was nnnn.	The system could not complete the boot routine.	Restart the system. If the error recurs, listen for a beep code and refer to Table 2. If no beep code is emitted, run the System Board Devices tests in the Dell Diagnostics.
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. "
Incompatible Processors: Cache sizes different!	This message appears for a dual-processor system if both processors do not have the same-size level-2 cache.	Replace one of the microprocessors to make the level-2 cache sizes match. If you need technical assistance, see " Getting Help. " <i>NOTE: This message indicates a fatal error. When a fatal error occurs, the system usually cannot be rebooted until an appropriate hardware change has been made.</i>
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	One or more RIMMs may be faulty or improperly seated.	See " Troubleshooting System Memory. "

Memory write/read failure at address, read value expecting value		
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 terminated by keystroke	The memory test did not complete.	Rerun the memory test.
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.	A nonbootable diskette is in drive A. 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 Requested sector not found	The operating system cannot read from the diskette or hard-disk drive. 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 .
Terminator/processor card cannot be installed!	Neither a terminator card nor a secondary microprocessor is installed in the secondary microprocessor connector (PROC_1).	Make sure that either a terminator card or a secondary microprocessor is installed in the PROC_1 connector. Reseat the microprocessor and start the system. If errors persist, see " Getting Help " for instructions on obtaining technical assistance. <i>NOTE: This message indicates a fatal error. When a fatal error occurs, the system usually cannot be rebooted until an appropriate hardware change has been made.</i>
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.	Power-on self-test (POST) has queried the enhanced integrated drive electronics (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.	Once 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.
Warning - Thermal probes failed.	At system start-up, the BIOS detected that one or both of the thermal probes in the computer are not operating.	You can continue to use the system, but be aware that the temperature probe(s) are disabled and if the processor overheats, the Thermal Shutdown service will not shut down the system. <i>NOTE: The Intel® Pentium® III microprocessor has a built-in thermocouple that halts microprocessor operation if the microprocessor exceeds its rated temperature.</i> To correct the problem, you must replace your system board. For technical assistance, see " Getting Help. "
Warning - Temperature is too high.	At system start-up, the BIOS detected that one or both microprocessors are overheated. After displaying this message, the BIOS halts the processes and turns off the system.	Let the system cool before attempting to restart it.
Write fault Write fault on selected drive	The operating system cannot write to the diskette or hard-disk drive.	See " Troubleshooting Drives. "

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 found in "[Getting Help.](#)" 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.

If the system loses power and beeps constantly when you turn it back on, the BIOS is probably corrupted. See "[BIOS Recovery Utility](#)" for information on restoring the BIOS.


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	Direct memory access (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 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 timer 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 Rambus dynamic random-access memory (RDRAM) device count; unsupported RIMM device count or technology	Verify that both RIMM sockets contain a RIMM or Rambus continuity module (RCM). If the problem recurs, replace the RIMM in socket B (if any), then the RIMM in socket A. If the problem is still not resolved, see " Getting Help " for instructions on obtaining technical assistance.
5-2-2-3	RDRAM levelization failure	Verify that both RIMM sockets contain a RIMM or RCM. If the problem recurs, replace the RIMM in socket B (if any), then the RIMM in socket A. If the problem is still not resolved, see " Getting Help " for instructions on obtaining technical assistance.

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 accompanied 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 found in "[Getting Help](#)." Also see "[Getting Help](#)" for instructions on obtaining

technical assistance.

Diagnostic LEDs

The power indicator light-emitting diode (LED) and the hard-disk drive LED on the front of the computer emit diagnostic codes that can help you troubleshoot a system problem. Table 3 lists the codes for the diagnostic LEDs, probable causes, and suggested corrective actions.


 **CAUTION:** Before servicing any components inside your computer, see "[Safety First—For You and Your Computer.](#)"

Table 3. Diagnostic LED Codes

Power LED Code	Hard-Disk Drive LED Code	Cause	Action
Blinking yellow	Blank	System power supply failure	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 microprocessor 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 <i>and a beep code</i> 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 <i>and no beep code and no video</i> 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 <i>and no beep code but the system locks up during POST</i>	N/A	An integrated system board device may be faulty.	See " Getting Help " for instructions on obtaining technical assistance.

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Temporary file. Delete before release.

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[Battery: Dell Precision WorkStation 220 System User's Guide](#)
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 [Adding a Second Microprocessor](#)

 [Upgrading an Existing Microprocessor](#)


Adding a Second Microprocessor

Use the following procedure to add a second microprocessor.


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

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

To use a second microprocessor, your system must be running an operating system that supports multiprocessing such as the Microsoft® Windows NT® operating system or a UNIX®-based operating system.

 **CAUTION:** The processor can get extremely hot during system operation. Be sure that the processor has had sufficient time to cool before you touch it.

 **CAUTION:** Before you remove the computer cover, see "[Safety First—For You and Your 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 8](#) in "Inside Your Computer."

1. Remove the computer cover according to the instructions in "[Removing and Replacing the Computer Cover](#)."
2. Rotate the power supply as described in "[Rotating the Power Supply Away From the System Board](#)."
3. Squeeze in on the two pairs of tabs on the airflow shroud and lift it away.
4. Remove the terminator card from the secondary single-edge connector (SEC) cartridge connector (labeled "PROC_1").

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

Install the voltage regulator module (VRM) in its socket on the system board.

For the location of the VRM socket, see [Figure 8](#) in "Inside Your Computer." Orient the VRM with its capacitors facing toward the side of the chassis containing the power supply.


6. Insert the new SEC cartridge/heat sink assembly into the system board connector.

Press the SEC cartridge firmly into its connector until it is fully seated and the latches snap into place. You must use up to 25 pounds (lb) of force to fully seat the SEC cartridge in its connector. If your upgrade kit includes two thumbscrews, install them to secure the heat sink to the system board (see [Figure 1](#)).

7. Replace the airflow shroud.
8. Rotate the power supply back into position, making sure that the securing tab snaps into place.
9. Replace the computer cover, and reconnect your computer and peripherals to their power sources and turn them on.

As the system boots, it detects the presence of the new processor and automatically changes the system configuration information in the System Setup program. If you installed a second microprocessor, the following message is displayed:

```
Second processor detected
```

 **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 top line in the system data area correctly identifies the installed processor(s).

See "[Using System Setup](#)."

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

Enabled-Silent.

See "[Chassis Intrusion](#)" for instructions.

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

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

See your Windows NT documentation for instructions.

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


13. Run the [Dell Diagnostics](#) to verify that the new microprocessor is operating correctly.

Upgrading an Existing Microprocessor

To upgrade an existing microprocessor, perform the following steps.

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

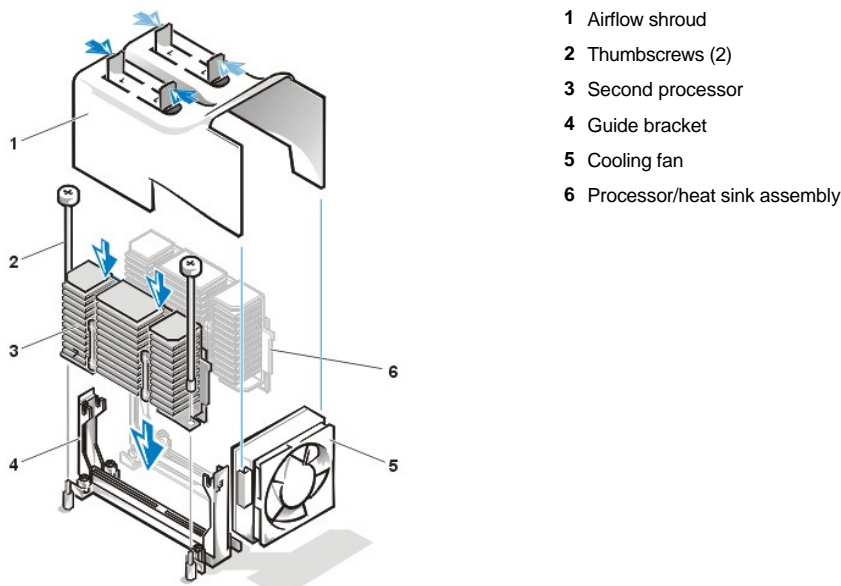
 **CAUTION:** Before you remove the computer cover, see "[Safety First—For You and Your Computer](#)."

 **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 8](#) in "[Inside Your Computer](#)."

1. Remove the computer cover according to the instructions in "[Removing and Replacing the Computer Cover](#)."
2. Rotate the power supply as described in "[Rotating the Power Supply Away From the System Board](#)."
3. Remove the airflow shroud by squeezing in on the two pairs of tabs and lifting it away.
4. Remove the existing microprocessor from its connector.

If present, remove the two thumbscrews that secure the heat sink to the system board. Press outward and hold one side of the guide bracket while pulling up on the processor/heat sink assembly. Repeat this process for the other side of the processor/heat sink assembly. Then pull the processor/heat sink assembly out of its connector (see [Figure 1](#)). You must use up to 15 lb of force to disengage the processor from the connector.

Figure 1. Microprocessor Removal




5. Insert the new microprocessor into the system board connector.

Press the processor firmly into its connector until it is fully seated. You must use up to 25 lb of force to fully seat the processor in its connector.

If you removed thumbscrews in step 4, replace them.

6. Replace the airflow shroud.
7. Rotate the power supply back into position, making sure that the securing tab snaps into place.
8. Replace the computer cover, and 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.

9. Enter System Setup, and confirm that the top line in the **System Data** area correctly identifies the installed processor(s).

See "[Using System Setup](#)."

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

See "[Chassis Intrusion](#)" for instructions.

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

11. Run the [Dell Diagnostics](#) to verify that the new microprocessor is operating correctly.

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Setup and Operation: Dell Precision™ WorkStation 220 System User's Guide

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- [Controls and Indicators](#)
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- [Security Cable Slot and Padlock Ring](#)
- [Using the System Password Feature](#)
- [Using the Setup Password Feature](#)
- [Disabling a Forgotten Password](#)

Getting Started

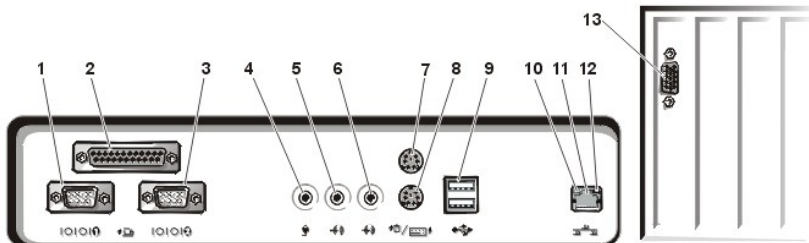
If you need to set up your computer system yourself (rather than having it set up by a network administrator), see "Getting Started" in the *System Information Guide* that accompanied your system for instructions on connecting cables and turning on your system for the first time.

After you correctly connect all the cables to your system and turn it on, see the setup guide for your operating system to complete its installation. When the operating system is installed, you can connect peripheral devices such as a printer, or install application programs not already installed by Dell.

Connecting Peripheral Devices

Figure 1 shows the connectors on the back of your computer for attaching external devices.

Figure 1. I/O Ports and Connectors



- 1 Serial port 1 connector (see "[Serial Port Connectors](#)")
- 2 [Parallel port connector](#)
- 3 Serial port 2 connector (see "[Serial Port Connectors](#)")
- 4 [Microphone jack](#)
- 5 [Line-out jack](#)
- 6 [Line-in jack](#)
- 7 [Mouse connector](#)
- 8 [Keyboard connector](#)
- 9 [USB connectors](#)
- 10 Link integrity indicator
- 11 [Integrated network interface controller connector](#)
- 12 Activity indicator
- 13 [Video connector](#)

When you connect external devices to your computer's back panel, follow these guidelines:

- 1 Check the documentation that accompanied the device for specific installation and configuration instructions.

For example, you must connect most devices to a particular input/output (I/O) port or connector to operate properly. Also, external devices like a printer usually require you to load device drivers through the operating system before they will work.

- 1 Always attach external devices *while your computer is turned off*. Then turn on the computer *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 5 seconds after turning off the computer before you disconnect any devices to avoid possible damage to the system board.

Serial Port Connectors

The serial ports use 9-pin D-subminiature connectors on the back panel. These ports support devices such as external modems or plotters that

require serial transmission (sending one bit of data at a time over one line).

The default designations for these integrated serial ports are COM1 for serial port 1 and COM2 for serial port 2. Port designations are used in software installation procedures to identify the port used by a device—for example, to specify the port used by a modem when you install communications software.

The system contains a reconfiguration feature to reassign the serial port's designation if you add an expansion card containing a serial port using this designation.

If you set the system's integrated serial ports to **Auto** in [System Setup](#) and add an expansion card containing a serial port configured to a specific designation, the computer automatically maps (assigns) the integrated ports to the appropriate COM setting as necessary.


Before you add a card with a serial port, check the documentation that accompanied your software to make sure that the software can be mapped to the new COM port designation.

Parallel Port Connector

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.

The default designation of your computer's integrated parallel port is LPT1. Port designations are used, for example, in software installation procedures to 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.)

 **NOTE:** The integrated parallel port is automatically disabled if the system detects an installed expansion card containing a parallel port configured to the same address as specified in [Parallel Port](#) in [System Setup](#).

Microphone Jack

The microphone jack can be used to attach a standard personal computer microphone. Connect the audio cable from the microphone to the microphone jack. The microphone input is a monaural source with maximum signal levels of 89 millivolts root mean squared (mVrms).

Line-Out Jack

The line-out jack can be used to attach most computer speakers. The line-out jack is amplified, so speakers with integrated amplifiers are not required. Connect the audio cable from the speakers to this jack.

Line-In Jack

The line-in jack can be used 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 line-in jack on the back of your computer.

Mouse Connector

Your system uses a Personal System/2 (PS/2)-compatible mouse. The mouse cable attaches to a 6-pin miniature Deutsche Industrie Norm (DIN) connector on the back panel of your computer. Turn off the computer and any attached peripherals before connecting a mouse to the computer.

A PS/2-compatible mouse works as does an industry-standard serial mouse or bus mouse except that it has its own dedicated connector, which frees up the serial ports and does not require an expansion card.

Mouse driver software gives the mouse priority with the microprocessor by issuing interrupt request (IRQ) 12 whenever you move the mouse. The drivers also pass along the mouse data to the application that is in control. If you have the Microsoft® Windows® 98 or Windows NT® 4.0 operating system, Dell already installed the necessary mouse drivers on your hard-disk drive.

Keyboard Connector

Your system uses a PS/2-style keyboard. The keyboard cable attaches to a 6-pin miniature DIN connector on the back panel of your computer.

USB Connectors

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

Integrated NIC Connector

Your system has an integrated 10/100-megabit-per-second (Mbps) 3Com® Peripheral Component Interconnect (PCI) 3C920 (3C905C-TX-compatible) Ethernet network interface controller (NIC). The NIC provides all the functions of a separate network expansion card and supports both the 10BASE-T and 100BASE-TX Ethernet standards.

The NIC includes a Remote Wakeup feature that enables the computer to be started up by a special local area network (LAN) signal from a server management console. Remote Wakeup provides remote computer setup, software downloading and installation, file updates, and asset tracking after hours and on weekends when LAN traffic is typically at a minimum. Remote Wakeup can be managed through the [Dell OpenManage™ IT Assistant](#).

The NIC connector on the computer's back panel has the following indicators (see [Figure 1](#)):

- 1 A yellow *activity indicator* 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.)
- 1 A dual-colored *link integrity and speed indicator*, which lights up green when there is a good connection between a 10-Mbps network and the NIC, or it lights up orange when there is a good connection between a 100-Mbps network and the NIC. When the orange or green indicator is off, the computer is not detecting a physical connection to the network.

Network Cable Requirements

Your computer's NIC connector (an RJ45 connector located on the back panel) is designed for attaching an unshielded twisted pair (UTP) Ethernet cable. Press one end of the UTP cable into the NIC connector until the cable snaps securely into place.

Connect the other end of the cable to an RJ45 jack wall plate or to an RJ45 port on a UTP concentrator or hub, depending on your network configuration.

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

- 1 Dell recommends the use of Category 5 wiring and connectors for our customers' networks.
- 1 The maximum cable run length (from a workstation to a concentrator) is 100 meters (m) (328 feet [ft]).
- 1 The maximum number of workstations (not counting concentrators) on a network is 1024.
- 1 The maximum number of daisy-chained concentrators on one network segment is four.

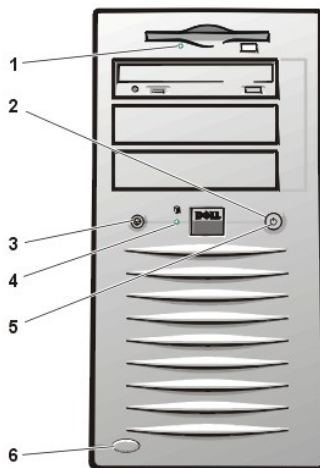
Video Connector

The system uses a 15-pin high-density D-subminiature connector on the back panel for attaching a video graphics array (VGA)-compatible monitor to your system.

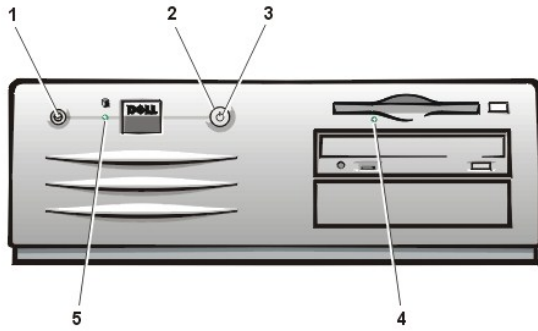
Controls and Indicators

Figure 2 shows the controls and indicators located on the front panel of your computer.

Figure 2. Controls and Indicators



- 1 [Diskette drive access indicator](#)
- 2 [Power button](#)
- 3 [Reset button](#)
- 4 [Hard-disk drive access indicator](#)
- 5 [Power indicator](#)
- 6 [Cover release button](#)



- 1 [Reset button](#)
- 2 [Power button](#)
- 3 [Power indicator](#)
- 4 [Diskette drive access indicator](#)
- 5 [Hard-disk drive access indicator](#)

Diskette-Drive Access Indicator

The diskette-drive access indicator lights up when the drive is reading data from or writing data to a diskette. Wait until the access indicator turns off before removing a diskette from the drive.

Power Button

The power button controls the system's AC input power. See the following table for power button functions on computers running Windows 98, Windows NT, or Windows 2000.

Computer Status	Power Button Function
Off	Press and release to turn the computer on.
On	Press and hold for more than 6 seconds to immediately turn the computer off. <i>NOTE: Use this method only if the computer will not shut down normally.</i>
On (Windows NT)	Press and release to attempt an orderly shutdown. <i>NOTE: This works only if the Dell system utilities are loaded on the computer. Without the utilities, the computer immediately turns off rather than performs an orderly shut down.</i>
On (Windows 2000)	Press and release to put the computer in the sleep state. <i>NOTE: This works depending on how Windows 2000 is configured.</i>
Sleep state (Windows 2000)	Press and release to bring the computer out of the sleep state.

If the system does not turn off when you press the power button, the system may be hung. Press and hold the power button until the system turns off completely (this process may take several seconds). Alternatively, press the reset button to reset the system and reboot. If the system is hung and both buttons fail to function properly, unplug the AC power cable from the computer, wait for it to completely stop running, plug in the AC power cable, and if the system does not restart, press the power button to restart the system.

Power Indicator

The power indicator on the front of the computer has a light-emitting diode (LED) that can illuminate in two different colors and can blink or remain solid to indicate several different states. See "[Diagnostic LEDs](#)" for a description of each of these states.

Reset Button

The reset button allows you to reboot (restart) your system without having to turn the power off and then on again. Rebooting the system in this manner reduces stress on system components. However, be sure that you have saved and closed all open files and application programs (if possible) to avoid losing any data. Then perform an orderly shutdown of the operating system (see your operating system documentation for instructions).

Hard-Disk Drive Access Indicator

The hard-disk drive access indicator lights up when a hard-disk drive or CD-ROM drive is reading data from or writing data to the drive.

Cover Release Button

On the back of the chassis, slide the upper half of the [padlock ring](#) to the left. Then press the cover release button to remove the computer cover.

Chassis Intrusion

An integrated chassis intrusion alarm displays the status of the system chassis intrusion monitor. If the chassis has been opened, the setting changes to **Detected** and the following message appears during the boot sequence at system start-up:

Alert! Cover was previously removed.

Use [System Setup](#) to reset the alarm so that future intrusions are detected.

Security Cable Slot and Padlock Ring

On the back of the computer are a security cable slot and padlock ring (see [Figure 3](#)) 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 your computer, loop the cable around an immovable object, insert the locking device into the security cable slot on the back of your computer, and lock the device with the key provided. Complete instructions for installing this kind of antitheft device are usually included with the device.


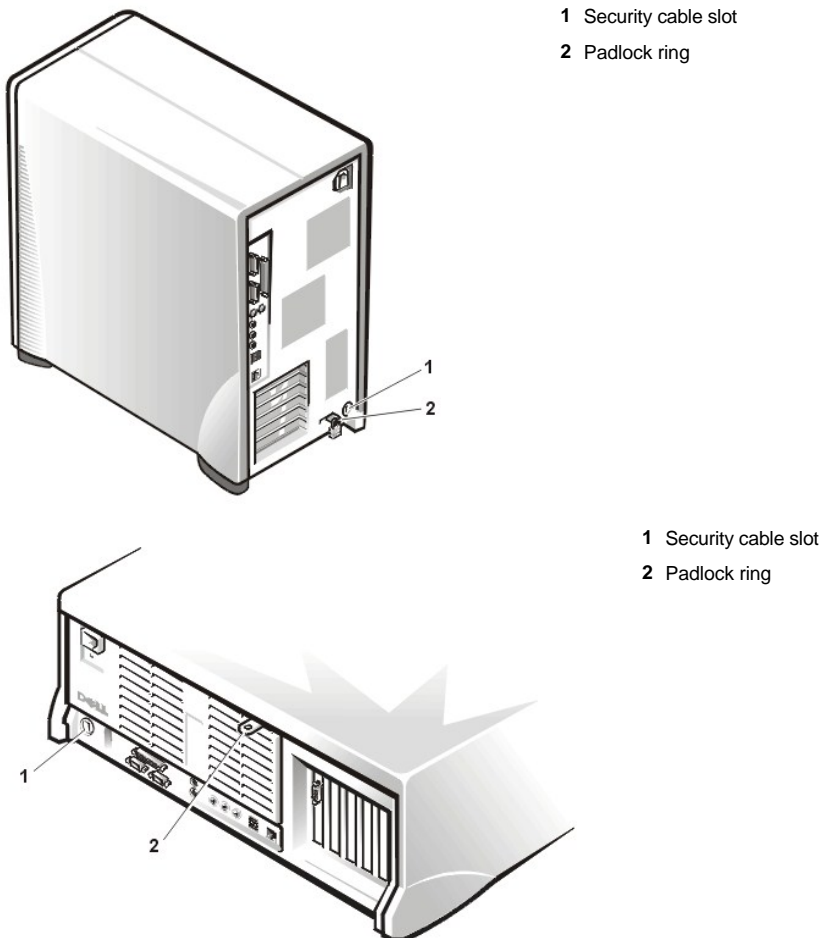
 **NOTE:** Antitheft devices are of differing designs. Before purchasing such a device, make sure it works with the cable slot on your computer.

Figure 3. Security Cable Slot and Padlock Ring



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, operate your system only with system password protection.

You can assign a system password, as described in "[Assigning a System Password](#)", whenever you use [System Setup](#). 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. See "[Using Your System Password to Secure Your System](#)" for more information.

To change an existing system password, you must know the password (see "[Deleting or Changing an Existing System Password](#)"). If you assign and later forget a system password, you must remove the computer cover to change a jumper setting that disables the system password feature (see "[Disabling a Forgotten Password](#)"). 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 System Setup and check the **System Password** option.

When a system password is assigned, the setting shown in **System Password** is **Enabled**. When the system password feature is disabled by a jumper setting on the system board, the setting shown is **Disabled**. *You cannot change or enter a new system password if either of these options is displayed.*

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

1. Verify that **Password Status** is set to **Unlocked**.

For instructions on changing the setting for **Password Status**, see "[Password Status](#)."

2. Highlight **System Password**, and then press the left- or right-arrow key.

The option heading changes to **Enter Password**, followed by an empty 32-character field in square brackets.

3. Type your new system password.

You can use up to 32 characters in your 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 entering your password, press <Backspace> or the left-arrow key.



NOTE: To escape from the field without assigning a system password, press <Tab> or the <Shift><Tab> combination to move to another field, or press <Esc> at any time prior to completing step 5.

4. Press <Enter>.

If the new system password is less than 32 characters, the whole field fills with placeholders. Then the option heading changes to **Verify Password**, followed by another empty 32-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 System Setup 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 either turn on your system or press the reset button, or when you reboot the system by pressing the <Ctrl><Alt> 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 and/or mouse to operate your system as usual.

 **NOTE:** If you have assigned a setup password (see "[Using the Setup Password Feature](#)"), the system accepts your setup password as an alternate system password.

If you enter a wrong or incomplete system password, the following message appears on the screen:

```
** Incorrect password. **
```

```
Enter password:
```

If you again enter an incorrect or incomplete system password, the same message appears on the screen.

The third and subsequent times you enter an incorrect or incomplete system password, 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 to an unauthorized person attempting to use your system.

Even after your system is turned off and on, the previous message is displayed each time an incorrect or incomplete 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 [System Setup](#) by pressing <F2>, and verify that [Password Status](#) is set to **Unlocked**.
2. Reboot your system to force it to prompt you for a system password.
3. When prompted, type the system password.
4. Press <Ctrl><Enter> to disable the existing system password, instead of pressing <Enter> to continue with the normal operation of your system.
5. Confirm that **Not Enabled** is displayed for the **System Password** option of System Setup.

If **Not Enabled** appears in the **System Password** option, the system password has been deleted. If you want to assign a new password, continue to step 6. If **Not Enabled** is not displayed for the **System Password** option, press <Alt> to reboot the system, and then repeat steps 3 through 5.

6. To assign a new password, follow the procedure in "[Assigning 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, as described in "[Assigning a Setup Password](#)," whenever you use System Setup. After you assign a setup password, only those who know the password have full use of System Setup. See "[Operating Your System With A Setup Password Enabled](#)" for more information.

To [change an existing setup password](#), you must know the setup password. If you assign and later forget a setup password, you need to remove the computer cover to change a jumper setting that disables the setup password feature (see "[Disabling a Forgotten Password](#)"). Note that you erase the system password at the same time.

Assigning a Setup Password

You can assign a setup password only if **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 [System Setup](#), the system prompts you for the setup password.


A change to **Setup Password** becomes effective immediately (rebooting the system is not required).

Operating Your System With a Setup Password Enabled

If **Setup Password** is set to **Enabled**, you must enter the correct setup password before you can modify any System Setup options.

When you start System Setup, the System Setup screen appears with **Setup Password** highlighted, prompting you to type the password.

If you do not enter the correct password, the system lets you view, but not modify, the System Setup screen.

 **NOTE:** You can use [Password Status](#) in conjunction with **Setup Password** to protect the 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 [System Setup](#).
2. If you have already assigned a setup password, enter it at the prompt.
3. Highlight **Setup Password** and press the left- or right-arrow key to delete the existing setup password.

The setting changes to **Not Enabled**.

4. If you want to assign a new setup password, perform the steps 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 System Setup until you remove the computer cover, 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 according to the instructions in "[Removing and Replacing the Computer Cover](#)."
2. Remove the jumper plug from the PSWD jumper to disable the password feature.

Refer to "[System Board Jumpers](#)" for jumper information and to [Figure 8](#) in "Inside Your Computer" for the location of the password jumper (labeled "PSWD") on the system board.

3. Replace the computer cover.
4. Reconnect your computer and peripherals to an electrical outlet, and then turn them on.
Booting your system with the PSWD jumper plug removed erases the existing password(s).
5. Enter [System Setup](#), and verify that the password is disabled. Proceed to step 6 if you want to assign a new password.

 **NOTE:** Before you assign a new system and/or setup password, you must replace the PSWD jumper plug to reenables the password feature.

 **CAUTION:** Before you remove the computer cover, see "[Safety First—For You and Your Computer](#)."

6. Remove the computer cover according to the instructions in "[Removing and Replacing the Computer Cover](#)."
7. Replace the PSWD jumper plug.
8. Replace the computer cover, and then reconnect the computer and peripherals to an electrical outlet and turn them on.

Booting your system with the PSWD jumper installed reenables the password feature. When you enter System Setup, both password options appear as **Not Enabled**, meaning that the password feature is enabled but that no password has been assigned.

9. Assign a new system and/or setup password.

To assign a new system password, see "[Assigning a System Password](#)." To assign a new setup password, see "[Assigning a Setup Password](#)."

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AC Power Recovery

AC Power Recovery determines what happens when AC power is restored to the system. When **Off** is selected, the system remains off when AC power is restored. When **On** is selected, the system starts up when AC power is restored. If your system is connected to a power strip, you can set this option to **On** to power on the system when you turn on the power strip.


The default for **AC Power Recovery** is **Off**.

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 A:

Selecting **Diskette Drive A:** 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 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> 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 ID

CPU ID provides the manufacturer's identification code(s) for the installed microprocessor(s). If you have two microprocessors installed, both should have the same identification code.

CPU Speed

CPU Speed indicates the processor speed at which your system boots.

Press the left- or right-arrow key to toggle the **CPU Speed** option between the resident microprocessor's rated speed (the default) and a lower compatibility speed, which lets you accommodate speed-sensitive application programs. A change to this option takes effect immediately (rebooting the system is not required).

To toggle between the rated processor speed and the compatibility speed while the system is running in real mode, press <Ctrl><Alt><|>. (For keyboards that do not use American English, press <Ctrl><Alt><#>.)

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:

- 1 **5.25 Inch, 360 KB**
- 1 **5.25 Inch, 1.2 MB**
- 1 **3.5 Inch, 720 KB**
- 1 **3.5 Inch, 1.44 MB**
- 1 **Not Installed**



*NOTE: 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**.*

Integrated Devices

Integrated Devices configures the following devices integrated with the system board:

- 1 [Sound](#)
- 1 [Network Interface Controller](#)
- 1 [Mouse Port](#)
- 1 [Serial Port 1 and Serial Port 2](#)
- 1 [Parallel Port](#)

- 1 [IDE Drive Interface](#)
- 1 [Diskette Interface](#)
- 1 [USB Emulation](#)
- 1 [PC Speaker](#)
- 1 [Primary Video Controller](#)
- 1 [Video DAC Snoop](#)

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 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> 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:

- 1 **COM1** (input/output [I/O] address 3F8h), which shares IRQ4 with **COM3**, is remapped to **COM3** (I/O address 3E8h).
- 1 **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 follows:

- 1 **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.
- 1 **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 Enhanced Capabilities Port (ECP) device connected to the port.*

- 1 **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).

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 and ignores any video cards installed in PCI slots. If you have multiple video cards installed and you are running the Microsoft® Windows® 98 operating system, you can use this option to set the primary video card.

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**.


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:

- 1 **Auto** (use this setting for all EIDE devices from Dell)
- 1 **Off**
- 1 **User 1 or User 2**
- 1 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:

- 1 If you know the drive-type number

Use the drive-type number you found in the documentation that came with the drive, or if the drive was installed by Dell when you purchased your system, access the Manufacturing Test Report from the **Dell Accessories** folder.


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.

- 1 If you do not know the drive-type number

The **Drive 0** and **Drive 1** options display the following parameters for each drive:

- o **Drive Type** is the drive-type number for the selected hard-disk drive.
- o **Capacity** (automatically calculated by the system) indicates the number of millions of bytes of storage provided by the drive.
- o **Cylinders** is the number of logical cylinders.
- o **Heads** indicates the number of logical heads in the drive.
- o **Sectors** is 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).*

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 microprocessor for troubleshooting purposes. If the system is having microprocessor-related problems, you can disable the second microprocessor to see if the problem is isolated to this microprocessor.

 **NOTE:** This option appears only if the system has two microprocessors.

System Data

The following information about the system is displayed in the system data area of the System Setup screen:

- 1 The microprocessor type and BIOS level.
 - 1 The size of the integrated level 2 (L2) cache.
 - 1 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 Memory also indicates the number of memory devices installed in the system. To display this information, highlight **System Memory** and press <Enter>. Your system supports a maximum of 32 memory devices. For example, if your system has two Rambus in-line memory modules (RIMMs) with 16 memory devices each, you cannot install a third RIMM.

System Security

System Security configures the following password and chassis intrusion options:

- 1 [System Password](#)
- 1 [Password Status](#)
- 1 [Setup Password](#)
- 1 [Chassis Intrusion](#)
- 1 [Remote System Alert](#)
- 1 [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:

- 1 **Not Enabled** (the default)
- 1 **Enabled**
- 1 **Disabled**

 **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 the setup password in **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:

- 1 **Not Enabled** (the default)
- 1 **Enabled**
- 1 **Disabled**

 **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.

Remote System Alert

Remote System Alert determines whether the system sends alert information (such as a chassis intrusion alert when the computer cover has been removed) over the network to a Dell OpenManage™ server. When **Enabled** is selected, the system sends alert information. When **Disabled** is selected, the system does not send alert information.

When your system is turned off, it does not send remote system alert information until the next time the system is turned on.

CPU Serial Number

CPU Serial Number determines whether the microprocessor serial number(s) (if any) is provided to programs that request it. When **Enabled** is selected, the system provides the microprocessor serial number(s) to programs that request it. When **Disabled** is selected, the system never provides the microprocessor 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 220 System 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:

- 1 Improper installation or configuration of a program
- 1 Input errors
- 1 Device drivers that conflict with certain application programs
- 1 Memory conflicts resulting from the use of terminate-and-stay-resident (TSR) programs
- 1 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 condition 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 accompanied 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 installing it on your computer's hard-disk drive. Viruses, which are 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 (BBSs) 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 running 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.

Memory-Resident Programs

There are a variety of utilities and supplementary programs that can be loaded either when the computer boots or from an operating system prompt. These programs are designed to stay resident in system memory and thus always be available for use. Because they remain in the computer's memory, memory conflicts and errors can result when other programs require use of all or part of the memory already occupied by these TSR programs.

Typically, your operating system's start-up files (such as **config.sys** and **autoexec.bat**) contain commands to start TSR programs when you boot your system. If you suspect that one of these TSR programs is causing a memory conflict, remove the commands that start them from the start-up file. If the problem you were experiencing does not recur, one of the TSR programs probably created the conflict. Add the TSR commands back into the start-up files one at a time until you identify which TSR program is creating the conflict.

Program Conflicts

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

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	Used by the video graphics array (VGA) interface (optional)
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

BIOS Recovery Utility

If your system loses power and beeps constantly but does not boot when power is restored, the basic input/output system (BIOS) is probably corrupted. To restore the BIOS, perform the following steps:

1. Disconnect the system from its power source.
2. Go to another working system, and download the BIOS update utility for the system from the Dell support Web site.


 **NOTE:** After you download the BIOS update utility, generate the BIOS recovery utility. To generate the recovery utility, you can use any functioning computer. You do not have to use a computer of the same type or model as the malfunctioning computer.

- a. Go to <http://support.dell.com>.

If this is your first time to use this website, complete the one-time registration.

- b. Click **Downloads for Your Dell**.
- c. Enter the Service Tag Number for the computer or select the appropriate Dell system.
- d. Select the appropriate OS and language for the malfunctioning computer.
- e. Select **FlashBIOS Updates** for the download category.
- f. Click **Go**.


3. Follow the instructions on the screen to download the BIOS update utility.

 **NOTE:** For some Dell systems, you are given a choice to create a diskette containing the BIOS update files or to download a file you can use from the hard drive. Select the choice to use the file that requires no installation mechanism, or application. This allows you to download a file that you can use from the hard drive.

4. On the working system, go to an MS-DOS® prompt and type the command `gx300axx -writehdrfile` (where `gx300axx` is the name of the BIOS update utility you downloaded and `axx` is the latest revision number).

Running this utility generates a file with an **.hdr** extension.

5. Copy the **.hdr** file to a diskette.

 **NOTE:** This diskette does not have to be bootable. All operations for the recovery utility are performed by the BIOS, and no boot files are required.

6. Insert the diskette into the diskette drive of the corrupted system and turn it on.

The system automatically flashes the BIOS from the diskette.

7. When the system begins to restart and the Dell logo screen appears, remove the diskette from the diskette drive so that the system does not boot from the diskette again.

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Processor

Microprocessor type	One or two Intel® Pentium® III microprocessors. Design provides for future Dell-supported upgrades. A slower compatibility speed can be set through System Setup .
Internal cache	32-kilobyte (KB) first-level (16-KB data cache; 16-KB instruction cache)
L2 cache memory	512-KB pipelined-burst, four-way set-associative, write-back static random-access memory (SRAM)
Math coprocessor	internal to Pentium III microprocessor

Memory

Architecture	Rambus dynamic RAM (RDRAM)
Rambus in-line memory module (RIMM) sockets	two
RIMM capacities	64-, 128-, 256-, and (when available) 512-megabyte (MB)
Standard RAM	128 MB minimum
Maximum RAM	1 gigabyte (GB) (when available, two 512-MB RIMMs that have 16 memory devices each)
BIOS address	F8000h

System Information

System chip set	Intel 820 Peripheral Component Interconnect (PCI)/accelerated graphics port (AGP)
Data bus width	64 bits
Address bus width	32 bits
Direct memory access (DMA) channels	eight
Interrupt levels	15
System basic input/output system (BIOS) chip	4 megabits (Mb)
System clock	100 or 133 MHz (matches external bus speed)

Video

Video type	AGP 4X or PCI graphics card (see manufacturer's specifications)
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Audio

Audio type	Soundblaster emulation
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Audio controller	Analog Devices AD1881 AC97 Codec
Stereo conversion	16 bit (analog-to-digital and digital-to-analog)
Interfaces:	
Internal	PCI bus/AC97
External	stereo line-in minijack; microphone-in minijack; headphones/speakers-out minijack

Expansion Bus

Bus types	PCI and AGP
Bus speed	PCI: 33 MHz AGP: 66 MHz
PCI expansion-card connectors	five
AGP expansion-card connectors	one universal (supports 4X and 2X protocols)
PCI expansion-card connector size	120 pins
PCI expansion-card connector data width (maximum)	32 bits
AGP expansion-card connector size	132 pins
AGP expansion-card connector data width (maximum)	32 bits

Drives

Externally accessible bays:	
Mini tower chassis	three 5.25-inch bays for diskette, tape, or CD-ROM drives; one 3.5-inch bay for a diskette drive
Desktop chassis	two 5.25-inch bays for diskette, tape, or CD-ROM drives; one 3.5-inch bay for a diskette drive
Internally accessible bays	two 3.5-inch bays for 1.6-inch-high hard-disk drives

Ports

Externally accessible:	
Serial (DTE)	two 9-pin connectors; 16550-compatible
Parallel	one 25-hole connector (bidirectional)
Video	one 15-hole connector (on video card)
Integrated network interface controller (NIC)	RJ45 connector
PS/2-style keyboard	6-pin mini-Deutsche Industrie Norm (DIN)
PS/2-compatible mouse	6-pin mini-DIN
Universal Serial Bus (USB)	two USB-compliant connectors

Audio	one microphone-in jack; one line-in/audio-in jack; one headphones/speakers jack
Internally accessible:	
Primary enhanced integrated drive electronics (EIDE) hard-disk drive	40-pin connector on PCI local bus
Secondary EIDE hard-disk drive	40-pin connector on PCI local bus
Diskette drive	34-pin connector
CD-ROM drive audio interface	4-pin connector
Remote Wakeup	3-pin connector
Fan	3-pin connector
Telephony	4-pin connector

Key Combinations

<Ctrl><Alt>	restarts (reboots) the system
<F2>	starts System Setup (during power-on self-test [POST] only)
<Ctrl><Alt><I>	toggles microprocessor speeds on 101-key keyboard (in MS-DOS® real mode only)
<Ctrl><Alt><#>	toggles microprocessor speeds on 102-key keyboard (in MS-DOS real mode only)
<Ctrl><Enter>	disables the system password at start-up

Controls and Indicators

Reset control	push button
Power control	push button
Power indicators	green light-emitting diode (LED); 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 and speed indicator (on integrated NIC connector)	green LED for 10-Mb operation; orange LED for 100-Mb operation
Activity indicator (on integrated NIC connector)	yellow LED

Power

DC power supply:	
Wattage	230 W
Heat dissipation	913 British thermal units (BTUs) (fully loaded system without monitor)
Voltage	90 to 135 volts (V) at 60 hertz (Hz); 180 to 265 V at 50 Hz
Backup battery	3-V CR2032 coin cell

Physical

Mini tower chassis:

Height	49.1 centimeters (cm) (19.3 inches)
Width	22.2 cm (8.7 inches)
Depth	45.3 cm (17.8 inches)
Weight	15 kilograms (kg) (33.0 pounds [lb]) or more, depending on options installed

Desktop chassis:

Height	16.5 cm (6.5 inches)
Width	44.1 cm (17.4 inches)
Depth	44.8 cm (17.7 inches)
Weight	13.3 kg (29.5 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 0.5 octave/minute (min)
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System Setup: Dell Precision™ WorkStation 220 System User's Guide

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Using System Setup: Dell Precision™ WorkStation 220 System User's Guide

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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:

- 1 To change the system configuration information after you add, change, or remove any hardware in your system
- 1 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.

After you set up your system, run System Setup to familiarize yourself with your system configuration information and optional settings. 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 steps:

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:

- 1 Title — The box at the top of all screens lists the system name.
- 1 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).
- 1 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.

- 1 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
 or 	Moves to the next field.
  or 	Moves to the previous field.
 or 	Cycles through the options in a field. In many fields, you can also type the appropriate value.
 or 	Scrolls through help information.
	Enters the selected field's pop-up options menu.
spacebar or 	In the selected field's pop-up options menu, cycles through the options in a field.
 	Exits System Setup without rebooting the system and returns the system to its previous state—the boot routine. ¹
 	Exits System Setup and reboots the system, implementing any changes you have made.
 	Resets the selected option to its default setting.

¹For 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.

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