



HP Vectra VE
Series 7

**Upgrade and
Maintenance Guide**

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Hewlett-Packard France
Corporate Desktop Computing Division
38053 Grenoble Cedex 9
France

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Upgrade and Maintenance Guide

Who This Manual Is For

This manual is for anyone who wants to:

- Configure the PC.
- Add accessories to the PC.
- Troubleshoot problems on the PC.
- Find out where to get more information and support.

For information about setting up and using your PC, refer to the *User's Guide* that came with your PC. The *User's Guide* is also part of the MIS kit for your PC (refer to page vi).

Important Safety Information

WARNING

If you have any doubt that you can lift the PC or display safely, do not try to move it without help.

For your safety, always connect the equipment to a grounded wall outlet. Always use a power cord with a properly grounded plug, such as the one provided with this equipment, or one in compliance with your national regulations. This PC is disconnected from the power by removing the power cord from the power outlet. This means the PC must be located close to a power outlet that is easily accessible.

For your safety, never remove the PC's cover without first removing the power cord from the power outlet, and any connection to a telecommunications network. Always replace the cover on the PC before switching it on again. To avoid electric shock, do not open the power supply.

This HP PC is a class 1 laser product. Do not attempt to make any adjustment of the laser units.

The MIS Kit for Your PC

This manual is part of the MIS kit, available from the HP Support Web site at:

<http://www.hp.com/go/vectrasupport/>

The MIS kit for your PC includes:

- *Using Sound on Your PC*—describes how to get the most out of your sound system (may also be available on the hard disk drive of multimedia models).
- *User's Guide*—describes in detail how to set up the PC. It also has summary information about installing accessories and troubleshooting.
- *Upgrade and Maintenance Guide*—this manual.
- *Familiarization Guide*—PC training information for support and maintenance personnel.
- *Network Administrator's Guide*—network driver installation information for network administrators.
- *Service Handbook Chapters*—information on upgrade and replacement parts, including HP part numbers.

You will also find complete information on the available service and support options at the HP World Wide Web site. To see the full set of services available, go to:

<http://www.hp.com/go/vectra/>.

Contents

1 How to Install Accessories in Your Desktop PC

Accessories You Can Install	2
Removing and Replacing the Cover	3
Removing the Cover.	3
Replacing the Cover After Installing Accessories	4
Installing Memory	5
Installing Main Memory	5
Installing Mass Storage Devices	7
Connecting IDE Devices	7
Configuring an IDE Device After Installation.	9
Installing an IDE Hard Disk Drive in an Internal Shelf	10
Installing a CD-ROM, Tape or Zip Drive in a Front Shelf.	13
Installing Accessory Boards.	18
Installing an Accessory Board.	19
Configuring Accessory Boards with Plug and Play	21
Configuring non-Plug and Play ISA Accessory Boards	22
Installing a Security Cable	23
Changing the Battery.	24
Installing a Key Lock.	26

2 How to Install Accessories in Your Minitower PC

Accessories You Can Install	28
Removing and Replacing the Cover	29

Removing the Cover	29
Replacing the Cover After Installing Accessories	30
Removing and Replacing the Power Supply Unit	31
Installing Memory.	32
Installing Main Memory.	32
Installing Mass Storage Devices	34
Connecting IDE Devices	34
Configuring an IDE Device After Installation	36
Installing a 3.5-inch Hard Disk Drive in an Internal Shelf.	37
Installing a Zip Drive, CD-ROM Drive, or Tape Drive	40
Installing Accessory Boards	44
Installing an Accessory Board	45
Configuring Accessory Boards with Plug and Play	47
Configuring non-Plug and Play ISA Accessory Boards	47
Installing a Security Cable.	48
Changing the Battery	49
Installing a Key Lock	51

3 Security Features

Setting Passwords	54
Using BIOS Passwords	54
Setting the Administrator Password	55
Setting the User Password	56

4 Troubleshooting Your PC

If Your PC Does Not Start Properly.....	58
Other Problems with Your PC	58
If There Is No Power.....	59
If There Is Nothing Displayed on the Screen.....	60
If There Is a Memory Test Error	61
If There Is a Keyboard or Mouse Test Error	62
If There Is a Floppy Disk Drive Test Error.....	63
If There Is a Hard Disk or CD-ROM Drive Test Error.....	64
If There Is a CMOS Test Error	65
If There Is a Serial or Parallel Port Test Error.....	66
Other Configuration Problems.....	67
If There Is a Beep Code During Startup	68
If You Cannot Turn Off Your PC.....	69
If You Have Forgotten Your Password	70
If the Wake On LAN Feature Does Not Work.....	71
If There Is an IRQ Problem Installing a Sound Board.....	72
If Your PC Has an Audio (Sound) Problem	73
If Your PC Has a Software Problem	74

Recovering Hard Disk Contents	75
Changing the Hard Disk	75
Recovering Software from a CD-ROM (Windows 95 and Windows NT Systems)	76
Recovering Software from a Second Hard Disk Drive (Windows NT Systems).....	76
Installation of Windows NT4 SP3 and HP Software Components	77
Installation of Customer Specific Software	79
Recovering from a BIOS Update Failure	80
HP DiagTools	82
Setting the Device Boot Order	84
Technical Information	85
System Board Switches.....	85
Power Consumption	86
Acoustic Noise Emission.....	86
Physical Characteristics	87
IRQs, DMAs, and I/O Addresses Used by Your PC	88
Hewlett-Packard Support and Information Services	90
Index	91

How to Install Accessories in Your Desktop PC

This chapter explains in detail how to install accessories, such as extra memory, accessory boards, and additional disk drives, in your PC.

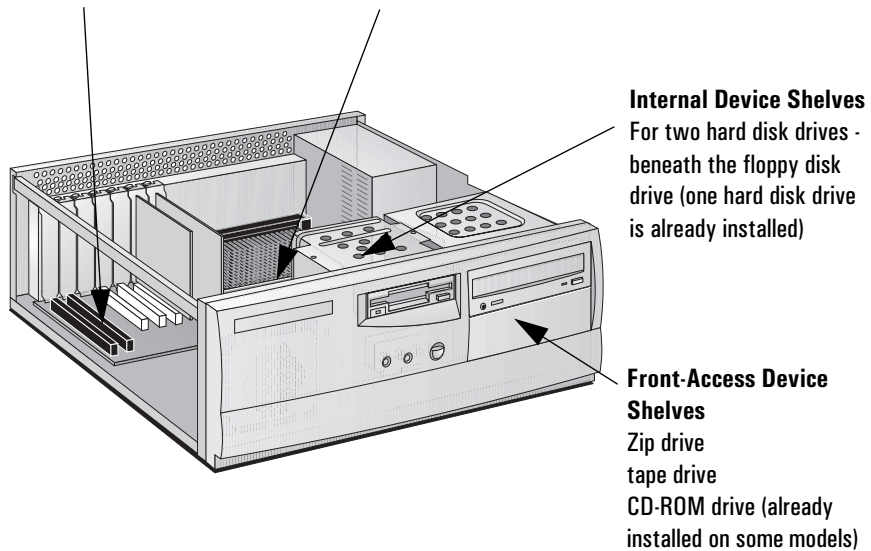
Accessories You Can Install

Accessory Board Slots

Two ISA, three PCI and one
AGP (some slots may come
with preinstalled boards)

Main Memory Modules (SDRAM)

16 MB kit SDRAM
32 MB kit SDRAM
64 MB kit SDRAM
128 MB kit SDRAM



Some accessories, for example, LAN cards, require the reinstallation of Service Pack 3 (Windows NT 4.0 only). When you do this, you must also reinstall the drivers for the video card. You can download the correct drivers from HP's Web site at:

<http://www.hp.com/go/vectrasupport/>.

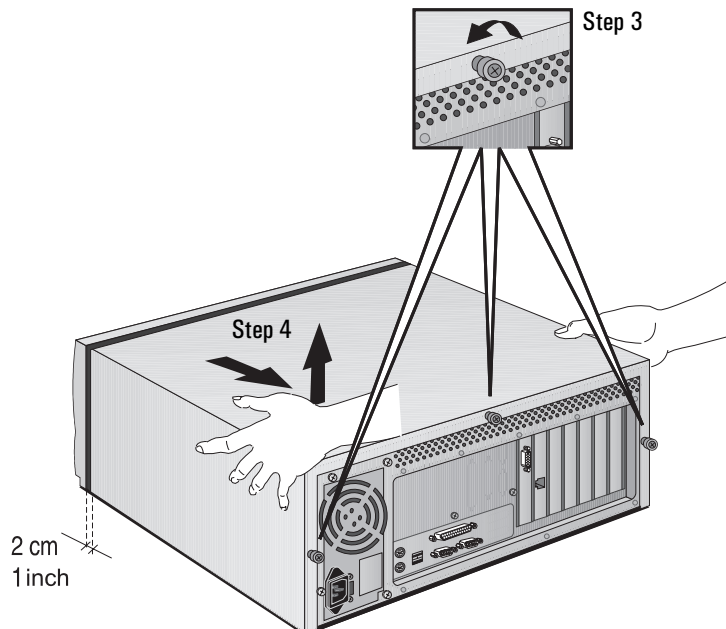
Removing and Replacing the Cover

WARNING

For your safety, never remove the PC's cover without first removing the power cord from the power outlet, and any connection to a telecommunications network. Always replace the cover before switching on the PC again.

Removing the Cover

- 1 Switch off the display and the PC.
- 2 Disconnect all power cords and any telecommunications cables.
- 3 Unscrew the three thumb screws at the back of the PC. If it is the first time you are removing the cover, you will probably need to use a screwdriver to loosen the screws.
- 4 While standing at the back of the PC, slide the cover towards you by about 20 mm (about 1 inch) and then lift it off the PC chassis.

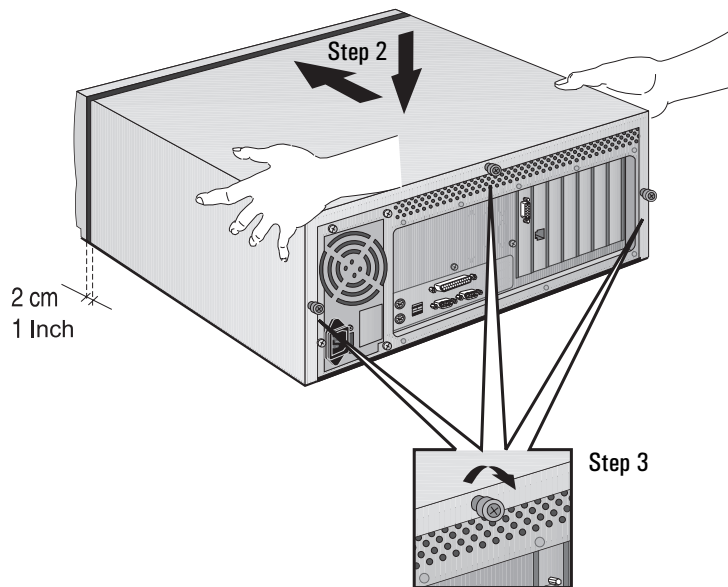


1 How to Install Accessories in Your Desktop PC

Removing and Replacing the Cover

Replacing the Cover After Installing Accessories

- 1 Make sure that you have installed all your accessories and that all internal cables are properly connected and safely routed.
- 2 Standing at the back of the PC, lower the cover onto the PC chassis (aligning the rails on the inside edges of the cover with the sides of the PC chassis), and firmly slide the cover forwards into position.
- 3 Tighten the three thumb screws at the back of the PC.



- 4 Reconnect all cables and power cords.

Installing Memory

CAUTION

Static electricity can damage electronic components. Turn OFF all equipment. Don't let your clothes touch the accessory. To equalize the static electricity, rest the accessory bag on top of the PC while you are removing the accessory from the bag. Handle the accessory as little as possible and with care. Hold it by the edges and avoid touching the components and connectors.

Installing Main Memory

Your PC is supplied with main memory. If you need more main memory to run your application software, you can install up to a total of 256 MB (two 128 MB modules).

Main memory is available in modules of 16 MB, 32 MB, 64 MB, or 128 MB. There are two memory "banks" (or slots), with each bank supporting one SDRAM memory module.

You can mix modules of different sizes if you wish—for example, you can put a 32 MB module in one slot and a 64 MB module in the other.

NOTE

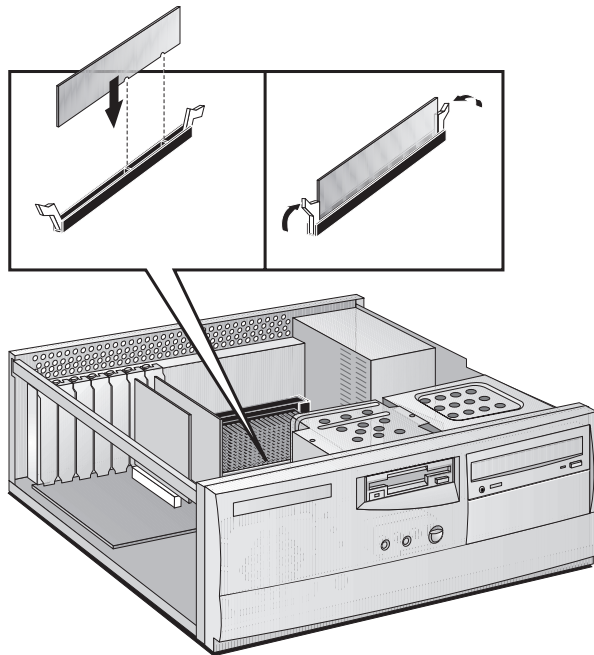
Although you can install Error Correcting Code (ECC) memory modules, the PC does not perform any error correction. You can mix ECC and non-ECC memory modules.

1 How to Install Accessories in Your Desktop PC

Installing Memory

To install a main memory module:

- 1 Disconnect the PC's power supply cord and any connection to a telecommunications network.
- 2 Remove the PC's cover.
- 3 Slide the memory module into the slot's socket at 90° to the system board (the module will only fit into the socket one way round).
- 4 Firmly press the memory module completely into the socket until the retaining clips click into position.



If you need to remove a main memory module, release the retaining clips and pull the module out of the socket.

- 5 Install any other accessories before replacing the cover. Reconnect all cables and power cords.
- 6 Check the new configuration by viewing the summary screen (press while the *Vectra* logo is displayed during system startup).

Installing Mass Storage Devices

NOTE

You can install a non-IDE hard disk drive or CD-ROM drive, but it will need an accessory board and driver software (usually supplied with the drive). Contact the product vendor for further information.

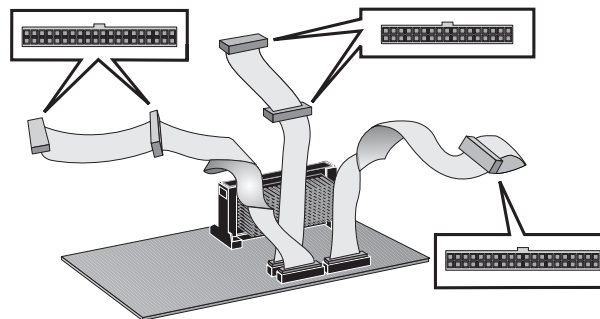
You can install additional mass storage devices if you need extra mass storage space. Up to two hard disk drives and two front-access devices (in addition to the floppy disk drive) can be installed in your PC. Your PC may already have a CD-ROM drive installed in one of the front-access shelves.

Connecting IDE Devices

If you add an IDE Zip drive, hard disk drive, CD-ROM drive, or tape drive, you need to connect it to power and data cables. The data cables are shown below:

IDE Hard Disk Drive data cable (the Master connector is at the end of the cable)

CD-ROM Drive data cable (the Master connector is at the end of the cable)



Note: If your PC does not have a preinstalled CD-ROM drive it will not have a CD-ROM data cable.

Flexible Disk Drive data cable (non-IDE)

1 How to Install Accessories in Your Desktop PC

Installing Mass Storage Devices

Which Data Connectors to Use

Depending on your PC model, there are either two or three data cables inside your PC. If you have a CD-ROM drive, there are three cables. If you do not have a CD-ROM drive, there are two cables. The cables are:

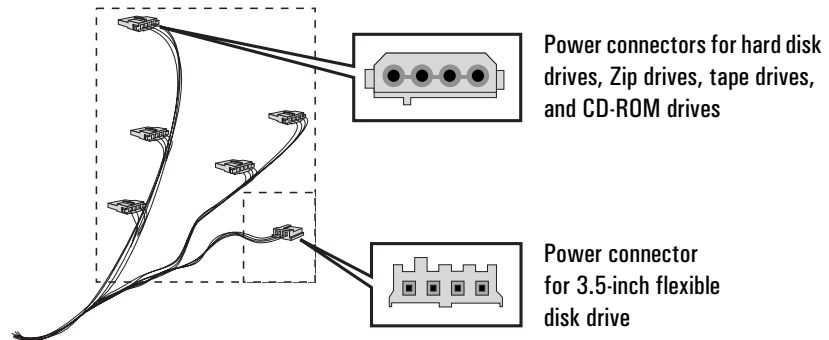
- An Ultra ATA IDE (Integrated Drive Electronics) hard disk drive cable. This supports up to two IDE hard disk drives, one of which is already connected. If you install a second IDE hard disk drive, connect it to this cable. (Refer to the drive's manual to check whether you need to set jumpers, or if there are any special installation procedures.)
- A second IDE drive cable that supports two IDE devices. If you have a CD-ROM drive, it is connected to this cable. If you do not have a CD-ROM drive, your PC does not have this cable. If you install a second front-access device, connect it to this cable. (Refer to the drive's manual to check whether you need to set jumpers, or if there are any special installation procedures.)
- A floppy disk drive cable. This supports one 3.5-inch floppy disk drive (already connected).

The following table explains which data connectors you should use when you install additional devices.

Examples of multiple IDE drive combinations		
Configuration	Connections to data cables	
1 Hard disk drive	1. Bootable hard disk drive:	Master connector, Hard Disk Drive Cable
2 Hard disk drives	1. Bootable hard disk drive: 2. Second hard disk drive:	Master connector, Hard Disk Drive Cable Slave connector, Hard Disk Drive Cable
1 Hard disk drive 1 CD-ROM drive	1. Bootable hard disk drive: 2. CD-ROM drive:	Master connector, Hard Disk Drive Cable Master connector, CD-ROM Cable
2 Hard disk drives 1 CD-ROM drive	1. Bootable hard disk drive: 2. Second hard disk drive: 3. CD-ROM drive:	Master connector, Hard Disk Drive Cable Slave connector, Hard Disk Drive Cable Master connector, CD-ROM Cable
1 Hard disk drive 1 CD-ROM drive 1 Zip drive	1. Bootable hard disk drive: 2. CD-ROM drive: 3. Zip drive:	Master connector, Hard Disk Drive Cable Master connector, CD-ROM Cable Slave connector, CD-ROM Cable
2 Hard disk drives 1 CD-ROM drive 1 Zip drive	1. Bootable hard disk drive: 2. Second hard disk drive: 3. CD-ROM drive: 4. Zip drive:	Master connector, Hard Disk Drive Cable Slave connector, Hard Disk Drive Cable Master connector, CD-ROM Cable Slave connector, CD-ROM Cable

Which Power Connectors to Use

There are two different types of power connectors—these are shown below.



Some of the power connectors will already be connected to devices. If you install a device that requires a different connector, the connector converter should be supplied with the device.

Selecting the Bootable Drive

To select the drive to start (boot) from, you must enter the *Setup* program and go to **Advanced - Advanced CMOS Setup**. You can then select the 1st, 2nd, 3rd, and 4th Boot Devices. Connecting a hard disk drive to the IDE master connector *does not* ensure that the PC will boot on that hard disk drive. It is the boot order settings in the *Setup* program that determine the boot order. Refer to page 84 for more information.

Jumper Settings

Refer to the IDE drive's manual to see if you must set jumpers. The drive jumper should be set to "cable select" or "CS".

Configuring an IDE Device After Installation

After installing an IDE drive you will need to verify that your PC has correctly identified the new configuration, by viewing the summary screen (press **Esc** while the *Vectra* logo is displayed during system startup). If the configuration is not correct, run the *Setup* program to configure the device (press **F2** while the *Vectra* logo is displayed during system startup).

1 How to Install Accessories in Your Desktop PC

Installing Mass Storage Devices

IDE drives are, by default, automatically detected by the *Setup* program (the IDE channels settings in the **Main** menu must be set to **Auto** to enable automatic detection). However, a newly installed CD-ROM drive may require that you install an appropriate device driver. Refer to your operating system documentation for details.

Installing an IDE Hard Disk Drive in an Internal Shelf

CAUTION

Handle the hard disk drive with care. Avoid shocks and violent movement as this can cause damage to the hard disk drive's internal components.

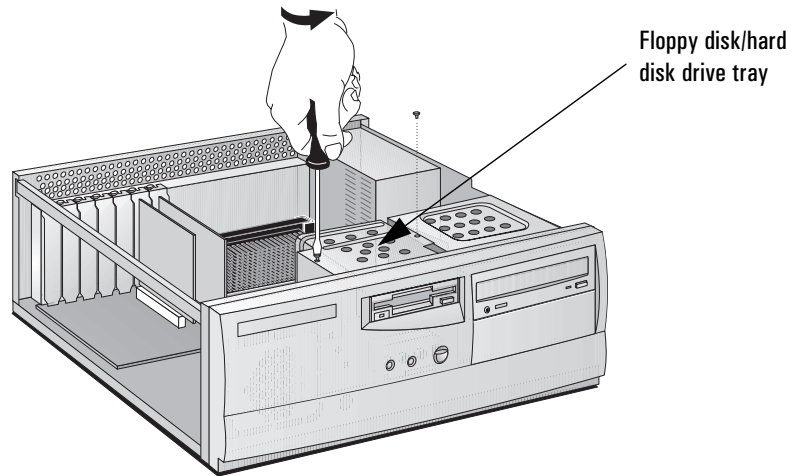
Make sure that you back up your files before you install a hard disk drive. Refer to your operating system documentation for information on how to do this.

There are two internal shelves for 3.5-inch hard disk drives. Both shelves are located under the floppy disk drive. One shelf already has a hard disk drive installed in it. You can use the second shelf for a second 3.5-inch hard disk drive.

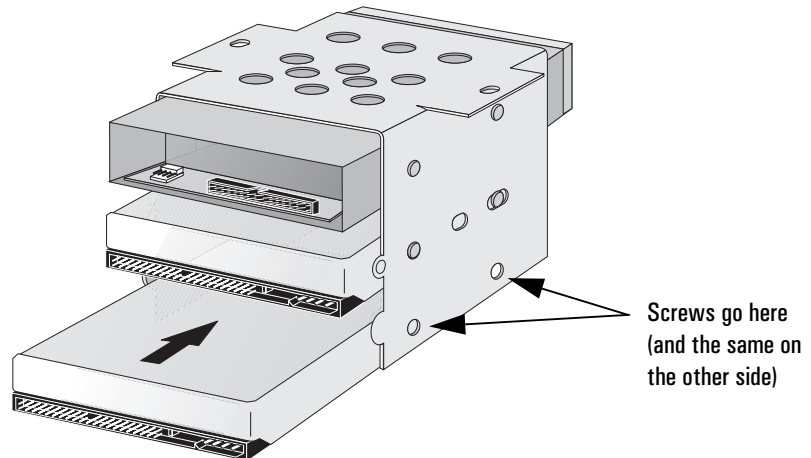
To install a new drive:

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 Disconnect the power and data cables from the rear of the floppy disk drive and the existing hard disk drive.

- 4 Remove the two retaining screws from the floppy disk/hard disk drive tray, and then carefully lift the tray from the PC. Place the tray on a table/desk top.



- 5 Insert the new drive into the spare shelf in the drive tray and secure the new drive to the tray using the screws provided with the drive.



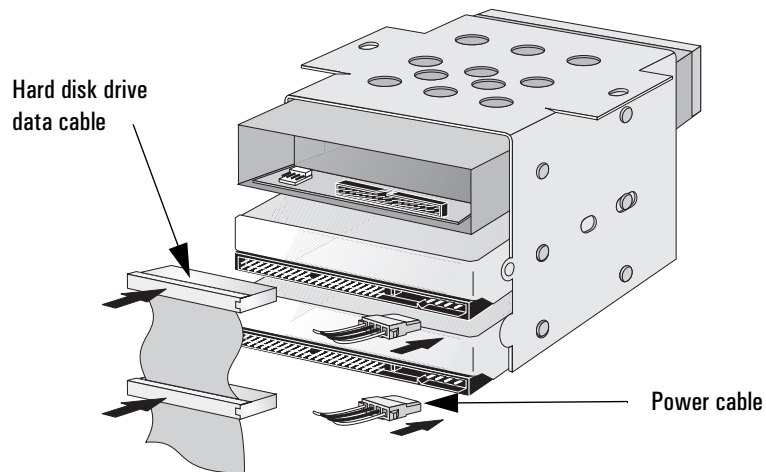
- 6 Carefully put the drive tray back into the PC, and secure it in position using the two retaining screws that you removed earlier.

1 How to Install Accessories in Your Desktop PC

Installing Mass Storage Devices

- 7 Connect the power cable and the data cable to the rear of the new hard disk drive. Remember to replace those for the floppy disk drive and the existing hard disk drive also.

The connectors are shaped to go in one way only. If you are not sure which connector to use, refer to "Connecting IDE Devices", on page 7.



- 8 Ensure that the data and power cables are neatly routed so that they do not interfere with any other device nor hinder the PC's cover.
- 9 Install any other accessories before replacing the cover. Reconnect all cables and power cords.
- 10 Check the new configuration by viewing the summary screen (press **Esc** while the *Vectra* logo is displayed during system startup).

Installing a CD-ROM, Tape or Zip Drive in a Front Shelf

WARNING

To avoid electric shock and harm to your eyes by laser light, do not open the laser module. The laser module should be serviced by service personnel only. Do not attempt to make any adjustment to the laser unit. Refer to the label on the CD-ROM drive for power requirements and wavelength. This product is a class 1 laser product.

The PC has an integrated Ultra ATA IDE controller which supports up to four IDE devices. Removable media IDE devices, such as CD-ROM drives, tape drives and Zip drives, require front access. In addition to the floppy disk drive, your PC supports two front-access 5.25-inch devices. Note that one front-access shelf may already have a CD-ROM drive installed in it.

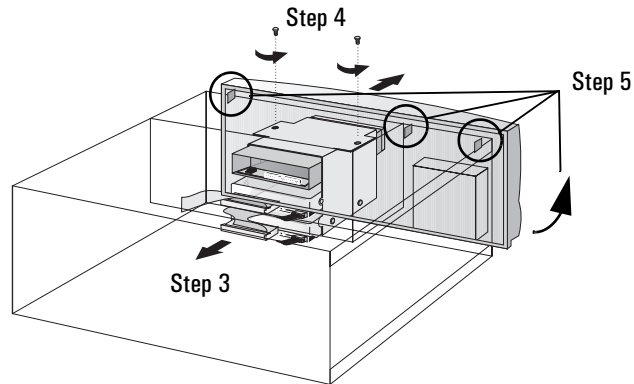
Refer to the drive's manual to see if you must set jumpers or if there is a special installation procedure to follow.

To install a front-access device:

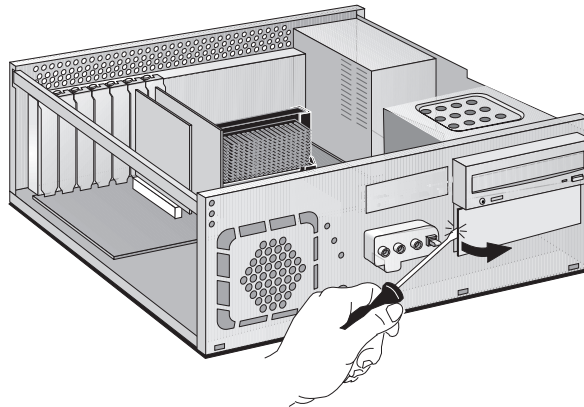
- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 Disconnect the power and data cables from the rear of the floppy disk drive and hard disk drive(s).
- 4 Remove the two retaining screws from the floppy disk/hard disk drive tray, and then carefully lift the tray from the PC. Place the tray on a table/desk top.
- 5 Unclip the front bezel and gently remove it from the chassis.

1 How to Install Accessories in Your Desktop PC

Installing Mass Storage Devices

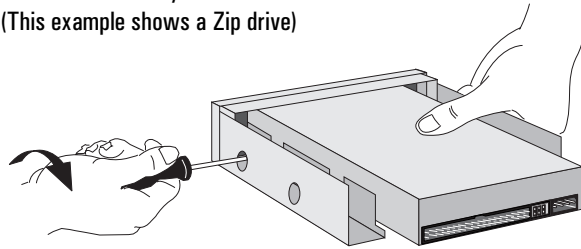


- 6 Carefully remove the metal filler plate from the PC chassis. Unlatch the filler first from one side, and then pull it out. Be very careful not to hurt your fingers when you do this. You need to use a screwdriver to help you to unlatch the plate.

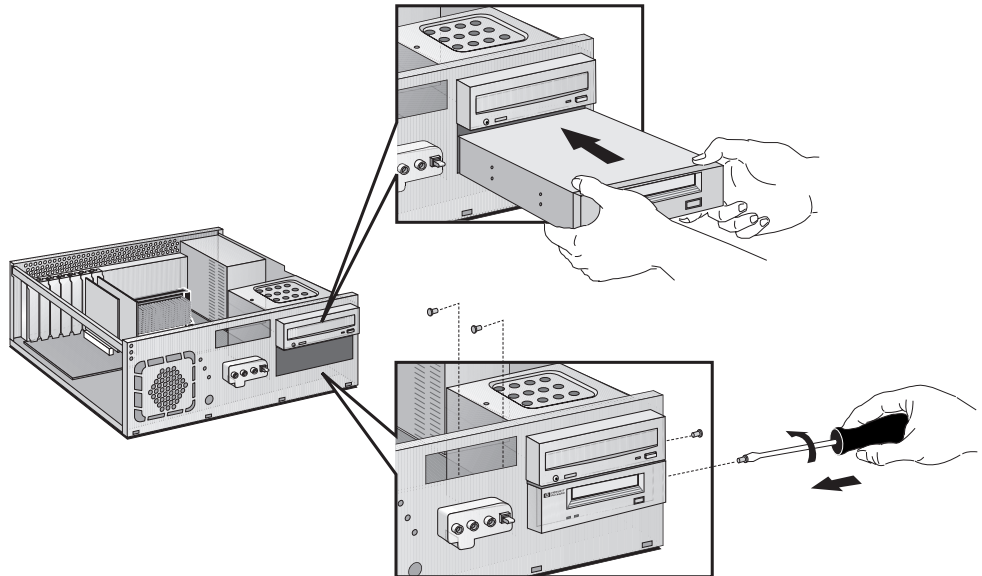


- 7 If the new drive has a tray, attach the drive to the tray. Many devices, such as the HP Zip drive, require an HP-supplied tray before they can be installed. CD-ROM drives do not require a tray.

Attach drive to tray
(This example shows a Zip drive)



- 8 Slide the new drive into the shelf and secure the drive in position using the screws supplied with it.

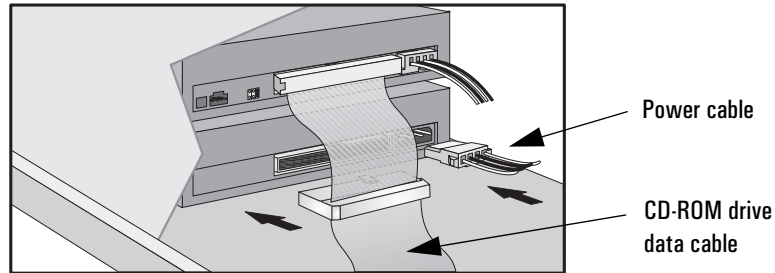


- 9 Connect the power cable and the data cable to the rear of the new drive.

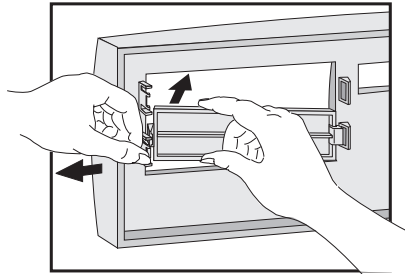
1 How to Install Accessories in Your Desktop PC

Installing Mass Storage Devices

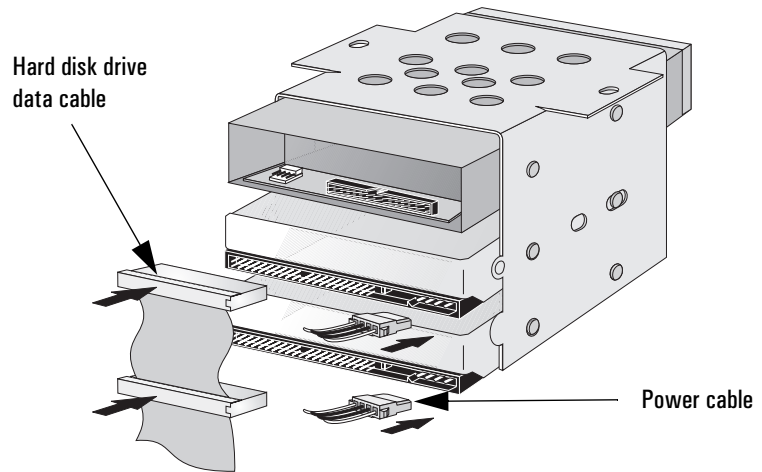
The connectors are shaped to go in one way only. If you are not sure which connector to use, refer to "Connecting IDE Devices", on page 7.



- 10 To allow access to the device, remove the plastic plate from the cover by unclipping it on one side and pivoting it out. Store the plate in a safe place.



- 11 Replace the front bezel.
- 12 Carefully put the floppy disk drive/hard disk drive tray back into the PC, and secure it in position using the two retaining screws you removed earlier. Reconnect the power and data cables to the floppy disk drive and hard disk drive(s).



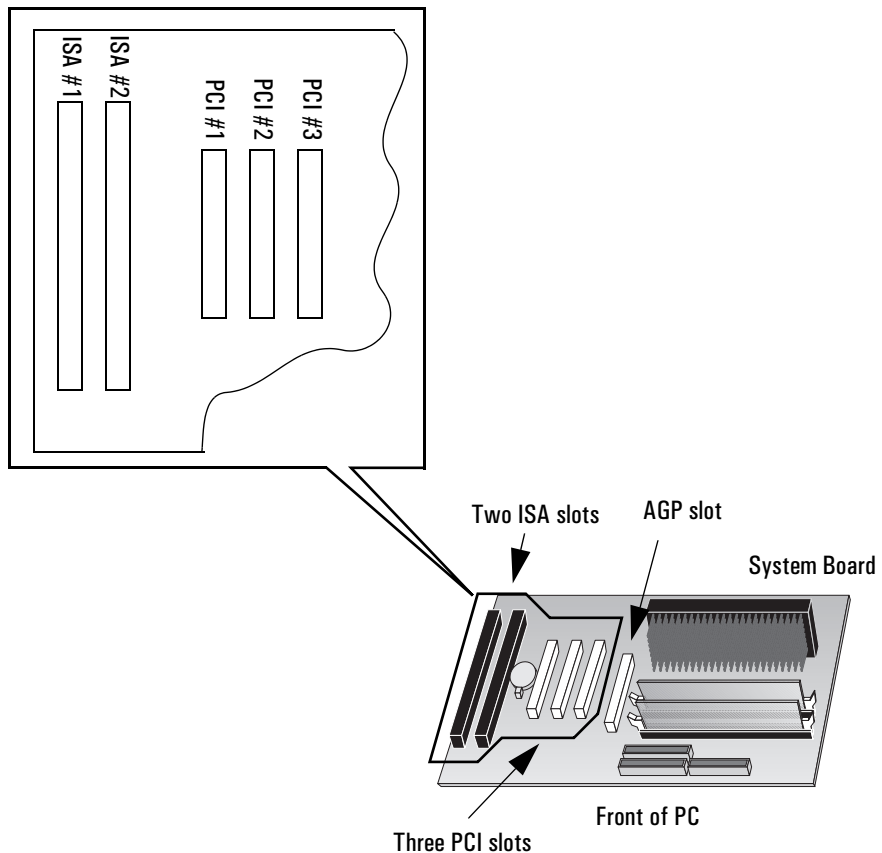
- 13 Install any other accessories before replacing the cover. Reconnect all cables and power cords.
- 14 Verify the new configuration by viewing the summary screen (press Esc while the *Vectra* logo is displayed during system startup).

Installing Accessory Boards

CAUTION

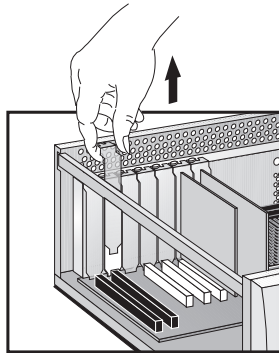
Static electricity can damage electronic components. Turn OFF all equipment. Don't let your clothes touch the accessory. To equalize the static electricity, rest the accessory bag on top of the computer while you are removing the accessory from the bag. Handle the accessory as little as possible and with care.

Your PC has one AGP (Accelerated Graphics Port) slot (for the video card), two ISA (Industry Standard Architecture) slots, and three PCI (Peripheral Component Interface) slots:

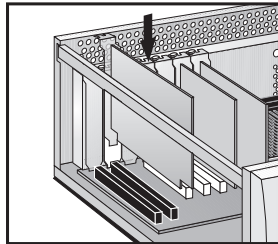


Installing an Accessory Board

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 Find a free slot. Some boards may have preferred locations and special installation instructions detailed in their manuals.
- 4 Unscrew the slot cover's retaining screw and remove the slot cover. Keep the screw, you will need it later. Store the slot cover in a safe place.



- 5 Hold the board by its "top" edge, and slide it into the board guide of the chosen slot. If you need to, loosen the retaining screws on the adjacent slots.

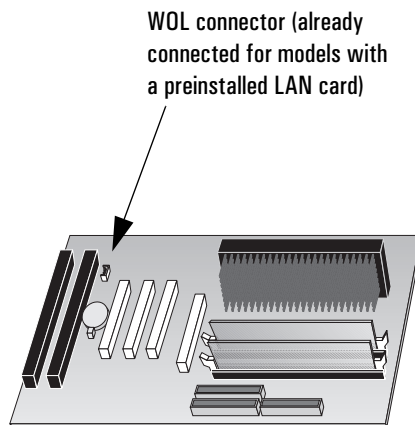


1 How to Install Accessories in Your Desktop PC

Installing Accessory Boards

- 6 Align the board's connector with the slot's socket and firmly press the board into the socket. Do not bend the board. Ensure the board's connector engages completely with the socket and does not touch components on other boards.
- 7 Secure the board by replacing the retaining screw. If you loosened any of the retaining screws on adjacent slots, remember to tighten them.
- 8 The accessory board may need a special connection, such as:
 - Network cable to the WOL (Wake On LAN) connector.
 - Sound cable to the CD-ROM drive.

The following figure shows the location of the WOL connector.



For more information, refer to the documentation that came with the accessory board. The necessary cables are usually provided with the accessory board.

- 9 Install any other accessories before replacing the cover. Reconnect all cables and power cords.

NOTE

If you install a network board and connect it to the WOL connector, you must enable the **Wake On LAN** field in the *Setup* program (**Advanced - Power Management Setup**) if the network board supports this mode.

After you have installed certain types of accessory, for example, a network board, you must reinstall Service Pack 3 (Windows NT 4.0 only). You must also reinstall the drivers for the video card. You can download the correct drivers from HP's Web site at: <http://www.hp.com/go/vectrasupport/>.

Configuring Accessory Boards with Plug and Play

Plug and Play is an industry standard for automatically configuring your PC's hardware resources and the accessory boards installed in it. Your PC has configurable support for Plug and Play in the BIOS.

All PCI accessory boards are Plug and Play, although not all ISA boards are. Check the accessory board's documentation if you are unsure.

When you start your PC after installing an accessory board, the Plug and Play BIOS automatically detects which hardware resources (IRQs, DMAs, memory ranges, and I/O addresses) are used by the system-based components.

1 How to Install Accessories in Your Desktop PC

Installing Accessory Boards

Windows 95

Operating systems that support Plug and Play, such as Windows 95, will automatically detect a newly installed Plug and Play accessory board and install the driver for this device, if the driver is available. If the driver is not available, Windows 95 will prompt you to insert a floppy disk or CD-ROM that contains the driver.

Windows NT 4.0

For operating systems that do not support Plug and Play, such as Windows NT 4.0, refer to the operating system documentation for information about installing accessory boards.

In Windows NT 4.0, click the **Start** button then click **Help**. You can use the contents or index to find information about installing devices. Windows NT 4.0 helps you through the installation of devices such as modems and sound boards.

Configuring non-Plug and Play ISA Accessory Boards

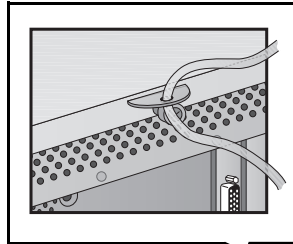
If you install an ISA accessory board that is not Plug and Play, you will need to configure the board before your PC can use it. For guidelines on available IRQs and I/O addresses in your PC, refer to page 88. Some operating systems, such as Windows 95, can display the IRQs and I/O addresses currently used by your PC. Refer to the operating system documentation for more information.

Refer to page 18 for information about accessory board slot numbers.

Refer to the documentation supplied with the operating system for details on your operating system's capabilities and restrictions concerning how to configure non-Plug and Play accessory boards.

Installing a Security Cable

You can secure the PC to your desk, or any other fixed object, using a security cable. The PC has a bracket at the rear for securing the cable.



NOTE

Contact your reseller for more information about ordering a security cable.

Changing the Battery

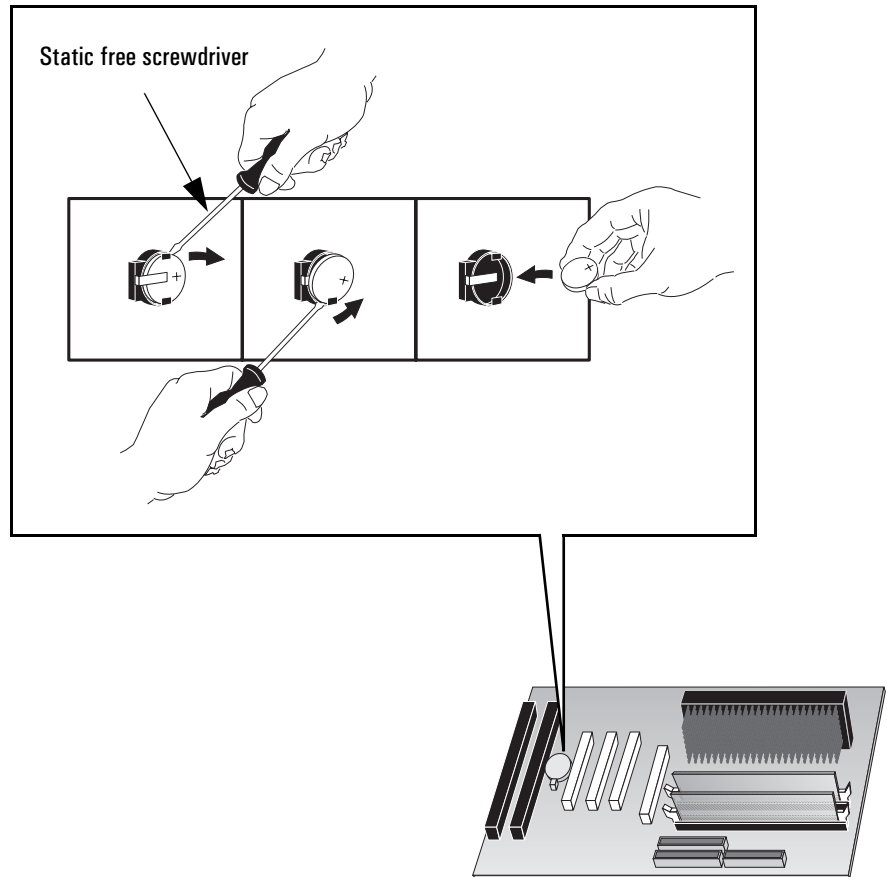
WARNING

There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. The battery is a lithium battery which does not contain heavy metals. Nevertheless, in order to protect the environment, do not dispose of batteries in household waste. Please return used batteries to the shop from which you bought them, or to the dealer from whom you purchased your PC Workstation, or to HP, so that they can be either recycled or disposed of in an environmentally sound way. Returned batteries will be accepted free of charge.

If your PC repeatedly loses its configuration settings you should consider changing the battery. Replace it with a CR2032 coin type manganese/lithium battery, available from most PC stores.

To change the battery:

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 Remove the old battery by sliding it from under the retaining clip.
- 4 Place the new battery in the battery holder and ensure that it is properly seated. Ensure that the clip holds the battery firmly in place.



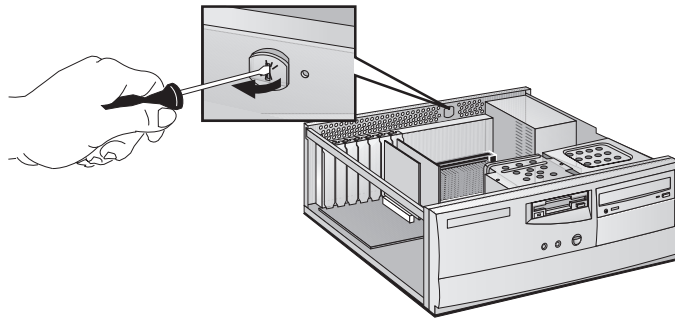
- 5 Replace the cover. Reconnect all cables and power cords.
- 6 Run the *Setup* program to reconfigure the PC.

Installing a Key Lock

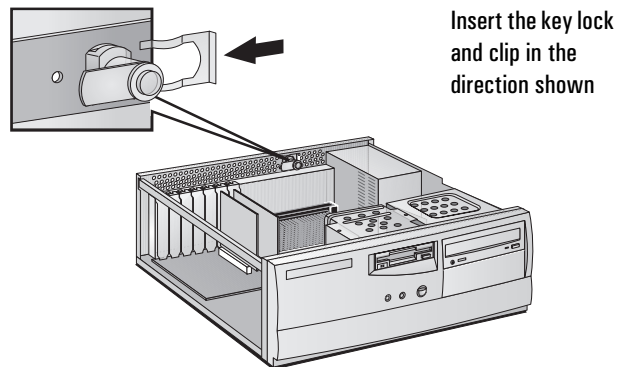
Your PC may have the facility to have a key lock installed.

To Install a Key Lock

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 Using a screwdriver, remove the small round metal filler from the PC's chassis.



- 4 Insert the key lock and secure it in position using the clip provided.



- 5 Replace the cover. Reconnect all cables and power cords.

How to Install Accessories in Your Minitower PC

This chapter explains in detail how to install accessories, such as extra memory, accessory boards, and additional disk drives, in your PC.

Accessories You Can Install

Main Memory Modules (SDRAM)

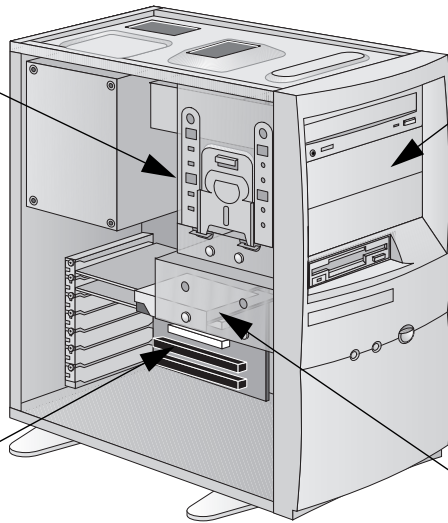
16 MB kit SDRAM
32 MB kit SDRAM
64 MB kit SDRAM
128 MB kit SDRAM

Front-Access Device Shelves

Zip drive
tape drive
CD-ROM drive (already installed on some models)

Accessory Board Slots

Two ISA, three PCI and one AGP (some slots may come with pre-installed boards)



Internal Device Shelves

For two hard disk drives - beneath the floppy disk drive (one hard disk drive is already installed)

Some accessories, for example, LAN cards, require the reinstallation of Service Pack 3 (Windows NT 4.0 only). When you do this, you must also reinstall the drivers for the video card. You can download the correct drivers from HP's Web site at:

<http://www.hp.com/go/vectrasupport/>.

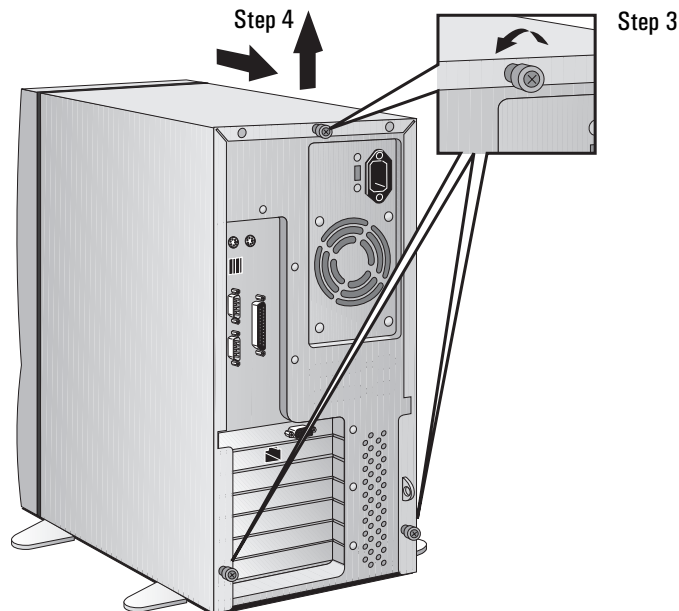
Removing and Replacing the Cover

WARNING

For your safety, never remove the PC's cover without first removing the power cord from the power outlet, and any connection to a telecommunications network. Always replace the cover on the PC before switching on the PC again.

Removing the Cover

- 1 Switch off the display and PC.
- 2 Disconnect all power cords and any telecommunications cables.
- 3 Unscrew the three thumb screws at the back of the PC. If it is the first time you are removing the cover, you will probably need to use a screwdriver to loosen the screws.
- 4 While standing at the back of the PC, slide the cover towards you by about 15 mm (1/2 - 3/4 inch) and then lift it off the PC chassis.

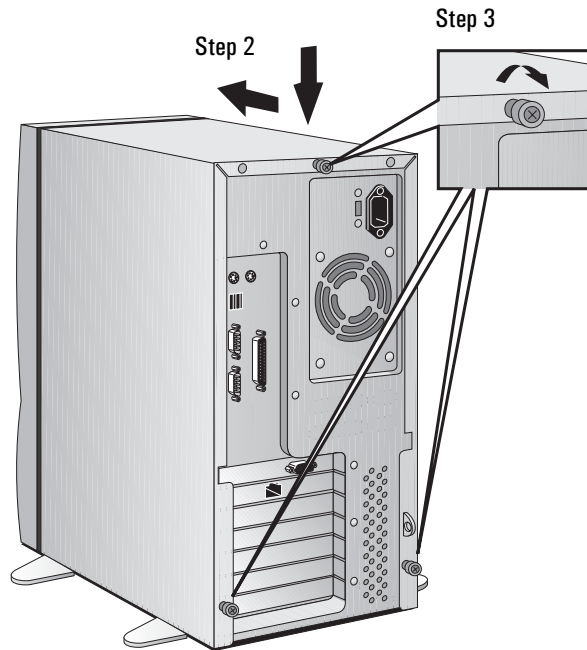


2 How to Install Accessories in Your Minitower PC

Removing and Replacing the Cover

Replacing the Cover After Installing Accessories

- 1 Make sure that you have installed all your accessories and that all internal cables are properly connected and safely routed.
- 2 Lower the cover onto the PC chassis and slide it into position. Make sure that the two guides at the bottom of the cover slide into the two rails at the base of the chassis, and that the guides at the front of the cover slide into the rails at the front of the chassis.
- 3 Tighten the three thumb screws at the rear of the cover.

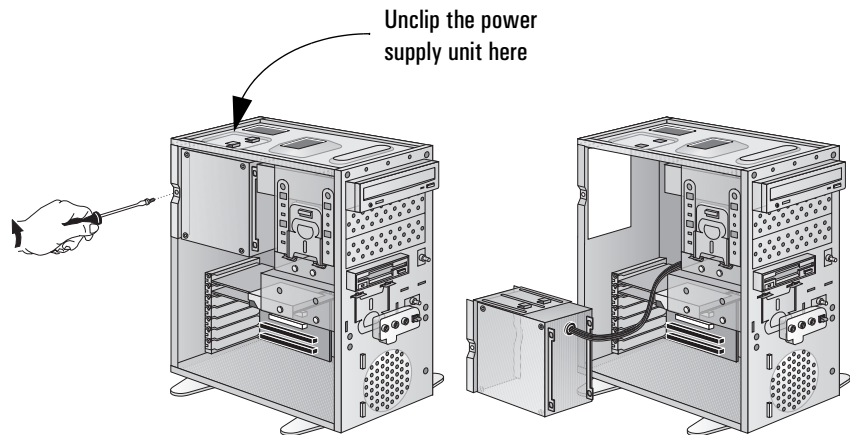


- 4 Reconnect all cables and power cords.

Removing and Replacing the Power Supply Unit

To improve access to the system board you may need to remove the power supply unit. To do this:

- 1 Disconnect the PC's power supply cord and any connection to a telecommunications network.
- 2 Remove the PC's cover.
- 3 While supporting the power supply unit with one hand, remove its retaining screw and unclip the unit from the top of the PC chassis.



- 4 Gently place the power supply unit next to the PC. Take care not to put any strain on any of the cables.
- 5 Install any accessories that you need to.
- 6 Secure the power supply unit back in position before replacing the cover. Reconnect all cables and power cords.

Installing Memory

CAUTION

Static electricity can damage electronic components. Turn OFF all equipment. Don't let your clothes touch the accessory. To equalize the static electricity, rest the accessory bag on top of the PC while you are removing the accessory from the bag. Handle the accessory as little as possible and with care. Hold it by the edges and avoid touching the components and connectors.

Installing Main Memory

Your PC is supplied with main memory. If you need more main memory to run your application software, you can install up to a total of 256 MB (two 128 MB modules).

Main memory is available in modules of 16 MB, 32 MB, 64 MB, or 128 MB. There are two memory "banks" (or slots), with each bank supporting one SDRAM memory module.

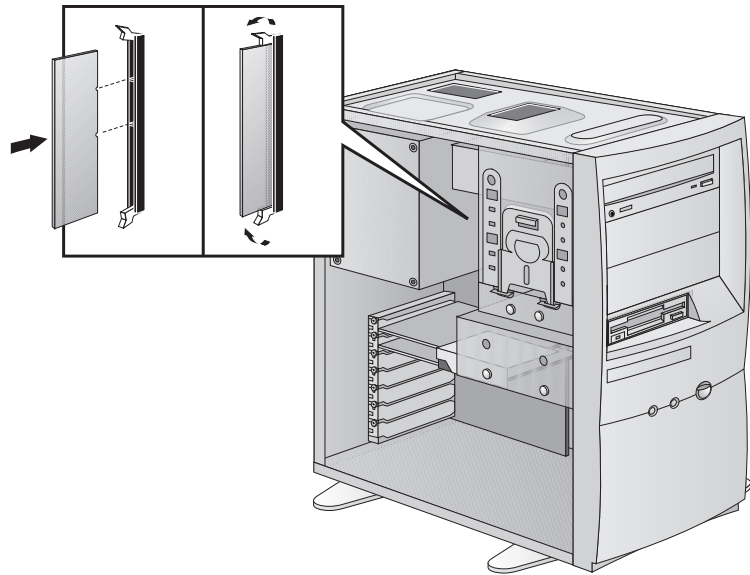
You can mix modules of different sizes if you wish—for example, you can put a 32 MB module in one slot and a 64 MB module in the other.

NOTE

Although you can install Error Correcting Code (ECC) memory modules, the PC does not perform any error correction. You can mix ECC and non-ECC memory modules.

To install a main memory module:

- 1 Disconnect the PC's power supply cord and any connection to a telecommunications network.
- 2 Remove the PC's cover.
- 3 If necessary, remove the power supply unit.
- 4 Slide the memory module into the slot's socket at 90° to the system board (the module will only fit into the socket one way round).
- 5 Firmly press the memory module completely into the socket until the retaining clips click into position.



If you need to remove a main memory module, release the retaining clips and pull the module out of the socket.

- 6 Install any other accessories before replacing the power supply unit (if you removed it earlier) and replacing the cover. Reconnect all cables and power cords.
- 7 Check the summary screen to verify the new configuration (To see the summary screen, press **Esc** while the *Vectra* logo is displayed during system startup.)

Installing Mass Storage Devices

NOTE

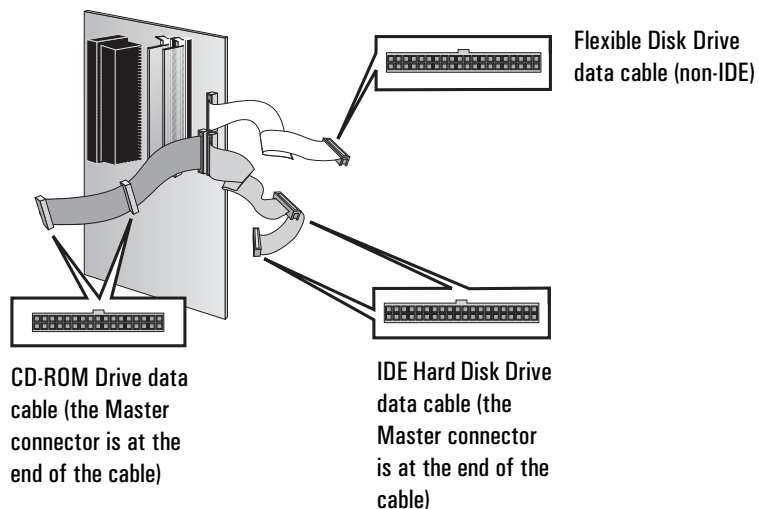
You can install a non-IDE mass storage device, but this requires an accessory board and driver software. Contact your authorized reseller for information.

You can install additional mass storage devices if you need extra mass storage space. Up to two hard disk drives and three front-access devices (in addition to the floppy disk drive) can be installed in your PC. Your PC may already have a CD-ROM drive installed in one of the front-access shelves.

Connecting IDE Devices

If you add an IDE Zip drive, hard disk drive, CD-ROM drive, or tape drive, you need to connect it to power and data cables. The data cables are shown below:

Note: If your PC does not have a preinstalled CD-ROM drive it will not have a CD-ROM data cable.



Which Data Connectors to Use Depending on your PC model, there are either two or three data cables inside your PC. If you have a CD-ROM drive, there are three cables. If you do not have a CD-ROM drive, there are two cables. The cables are:

- An Ultra ATA IDE (Integrated Drive Electronics) hard disk drive cable. This supports up to two IDE hard disk drives, one of which is already connected. If you install a second IDE hard disk drive, connect it to this cable. (Refer to the drive's manual to check whether you need to set jumpers, or if there are any special installation procedures.)
- A second IDE drive cable that supports two IDE devices. If you have a CD-ROM drive, it is connected to this cable. If you do not have a CD-ROM drive, your PC does not have this cable. If you install a second front-access device, connect it to this cable. (Refer to the drive's manual to check whether you need to set jumpers, or if there are any special installation procedures.)
- A floppy disk drive cable. This supports one 3.5-inch floppy disk drive (already connected).

The following table explains which data connectors you should use when you install additional devices.

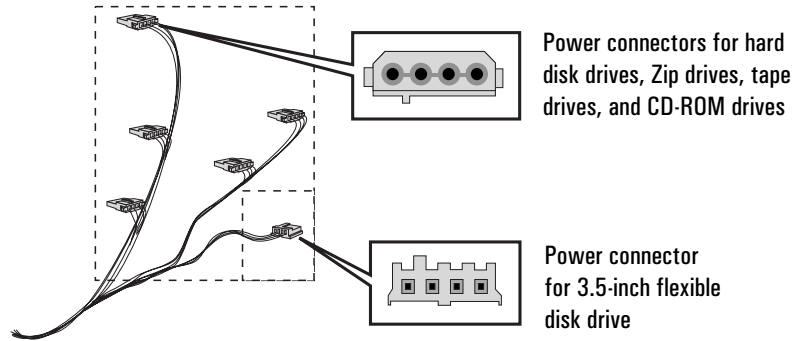
Examples of multiple IDE drive combinations		
Configuration	Connections to data cables	
1 Hard disk drive	1. Bootable hard disk drive:	Master connector, Hard Disk Drive Cable
2 Hard disk drives	1. Bootable hard disk drive: 2. Second hard disk drive:	Master connector, Hard Disk Drive Cable Slave connector, Hard Disk Drive Cable
1 Hard disk drive 1 CD-ROM drive	1. Bootable hard disk drive: 2. CD-ROM drive:	Master connector, Hard Disk Drive Cable Master connector, CD-ROM Cable
2 Hard disk drives 1 CD-ROM drive	1. Bootable hard disk drive: 2. Second hard disk drive: 3. CD-ROM drive:	Master connector, Hard Disk Drive Cable Slave connector, Hard Disk Drive Cable Master connector, CD-ROM Cable
1 Hard disk drive 1 CD-ROM drive 1 Zip drive	1. Bootable hard disk drive: 2. CD-ROM drive: 3. Zip drive:	Master connector, Hard Disk Drive Cable Master connector, CD-ROM Cable Slave connector, CD-ROM Cable
2 Hard disk drives 1 CD-ROM drive 1 Zip drive	1. Bootable hard disk drive: 2. Second hard disk drive: 3. CD-ROM drive: 4. Zip drive:	Master connector, Hard Disk Drive Cable Slave connector, Hard Disk Drive Cable Master connector, CD-ROM Cable Slave connector, CD-ROM Cable

2 How to Install Accessories in Your Minitower PC

Installing Mass Storage Devices

Which Power Connectors to Use

There are two different types of power connectors—these are shown below.



Some of the power connectors will already be connected to devices. If you install a device that requires a different connector, the connector converter should be supplied with the device.

Selecting the Bootable Drive

To select the drive to start (boot) from, you must enter the *Setup* program and go to **Advanced - Advanced CMOS Setup**. You can then select the 1st, 2nd, 3rd, and 4th Boot Devices. Connecting a hard disk drive to the IDE master connector *does not* ensure that the PC will boot on that hard disk drive. It is the boot order settings in the *Setup* program that determine the boot order. Refer to page 84 for more information.

Jumper Settings

Refer to the IDE drive's manual to see if you must set jumpers. The drive jumper should be set to "cable select" or "CS".

Configuring an IDE Device After Installation

After installing an IDE drive you will need to verify that your PC has correctly identified the new configuration, by viewing the summary screen (press **Esc** while the *Vectra* logo is displayed during system startup). If the configuration is not correct, run the *Setup* program to configure the device (press **F2** while the *Vectra* logo is displayed during system startup).

IDE drives are, by default, automatically detected by the *Setup* program (the IDE channels settings in the **Main** menu must be set to **Auto** to enable automatic detection). However, a newly installed CD-ROM drive may require that you install an appropriate device driver. Refer to your operating system documentation for details.

Installing a 3.5-inch Hard Disk Drive in an Internal Shelf

CAUTION

Handle the hard disk drive with care. Avoid shocks and violent movement as this can cause damage to the hard disk drive's internal components.

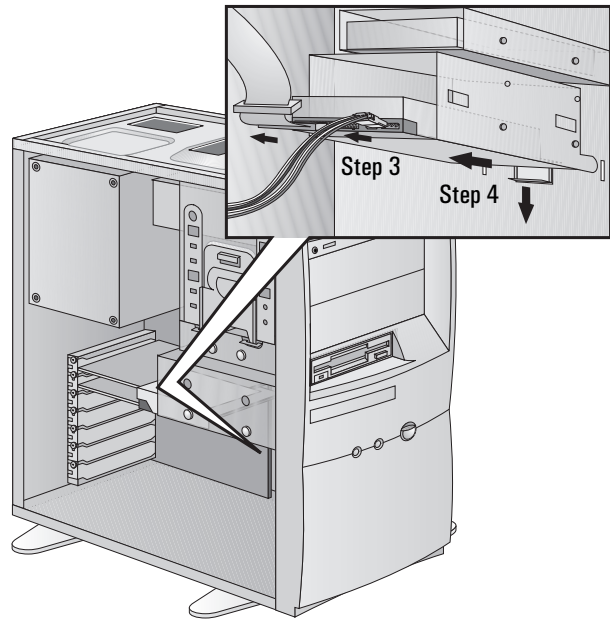
Make sure that you back up your files before you install a hard disk drive. Refer to your operating system documentation for information on how to do this.

Refer to the drive's documentation to see if you must set jumpers or if there is a special installation procedure to follow. If your new hard disk drive already has a mounting tray attached, you must remove it before you can install the drive in your PC.

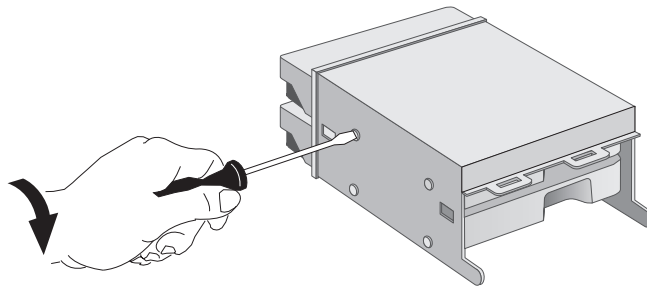
- 1 Switch off the display and computer, and disconnect the power supply cables and any telecommunications cables.
- 2 Remove the computer's cover.
- 3 Remove the data and power cables from the rear of the existing hard disk drive.
- 4 Push the retaining clip down and slide the hard disk drive tray backwards away from the front of the PC. Place the tray on a table/desk top.

2 How to Install Accessories in Your Minitower PC

Installing Mass Storage Devices



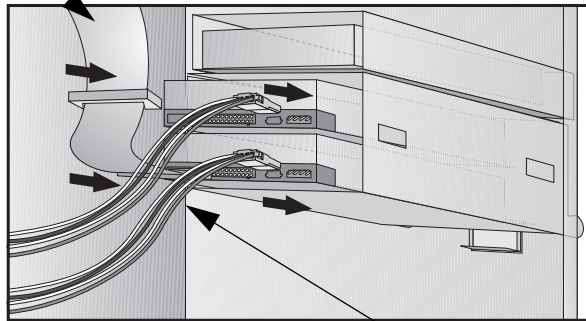
- 5 Insert the new drive into the spare shelf in the drive tray and secure the new drive to the tray using the screws provided with the drive.



- 6 Carefully put the drive tray back into the PC, and secure it in position using the retaining bracket.

- 7 Connect the power and data cables to the rear of both the new drive and the existing drive, if you have not done so already. The connectors are shaped to fit one way only. If you are not sure which connectors to use, refer to “Connecting IDE Devices” on page 34.

Hard disk data
cable



Power Cable

- 8 Ensure that the data and power cables are neatly routed so that they do not interfere with any other device nor hinder the PC's cover.
- 9 Install any other accessories before replacing the cover. Reconnect all cables and power cords.
- 10 Verify the new configuration by viewing the summary screen (press **Esc** while the *Vectra* logo is displayed during system startup).

2 How to Install Accessories in Your Minitower PC

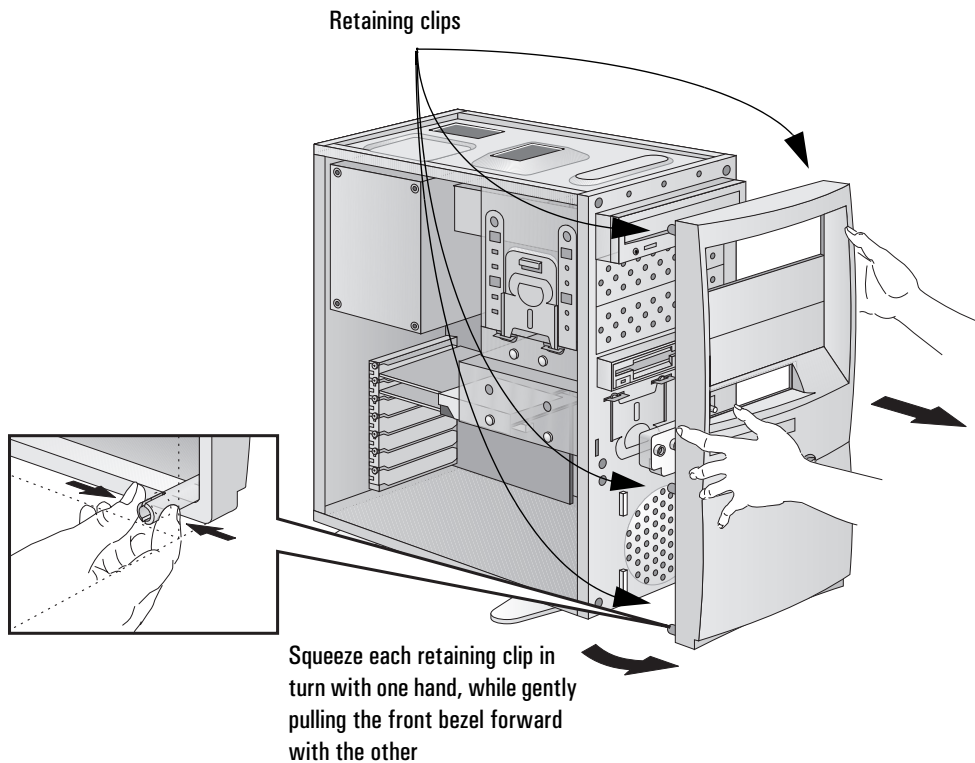
Installing Mass Storage Devices

Installing a Zip Drive, CD-ROM Drive, or Tape Drive

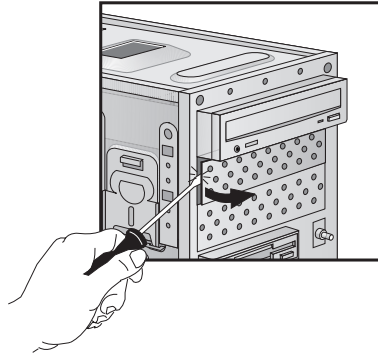
WARNING

To avoid electric shock and harm to your eyes by laser light from a CD-ROM drive, do not open the CD-ROM drive enclosure. The drive should be serviced by authorized service personnel only.

- 1 Switch off the display and computer, and disconnect the power supply cables and any telecommunications cables.
- 2 Remove the computer's cover.
- 3 Remove the front bezel. You need to gently squeeze the retaining clips together and then, standing in front of the PC, carefully lever the bezel away from the chassis.

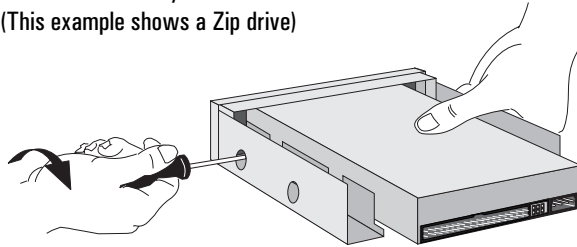


- 4 Carefully remove the metal filler plate from the chassis. Unlatch the filler first from one side, and then pull it out. Be very careful not to hurt your fingers when you do this. You need to use a screwdriver to help you to unlatch the plate.



- 5 If the new drive has a tray, attach the drive onto the tray. Many devices, such as the HP Zip drive, require an HP-supplied tray before they can be installed. CD-ROM drives do not require a tray.

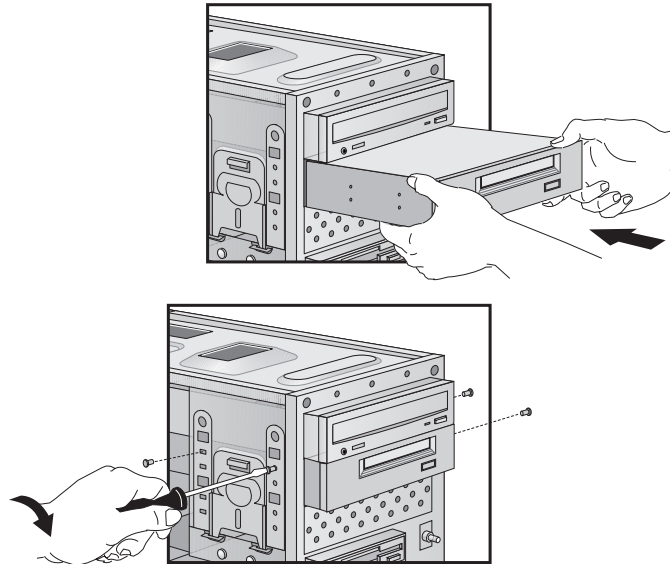
Attach drive to tray
(This example shows a Zip drive)



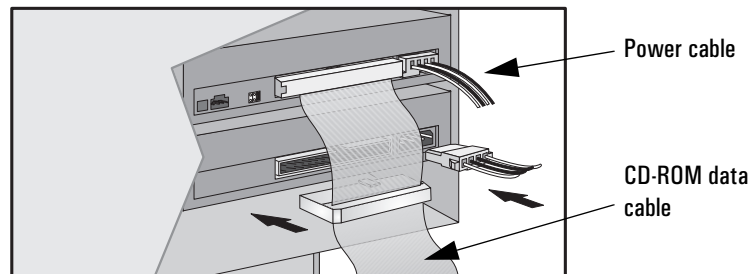
- 6 Slide the drive completely into the shelf, and secure the drive in position using the screws provided with it.

2 How to Install Accessories in Your Minitower PC

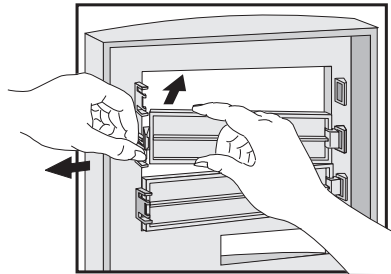
Installing Mass Storage Devices



- 7 Connect the power and data cables to the rear of the device (the connectors are shaped to go in one way only). Refer to “Connecting IDE Devices” on page 34 for more information about which connectors to use.



- 8 To allow access to the device, remove the relevant plastic plate from the cover by unclipping it on one side and pivoting it out. Store it in a safe place.



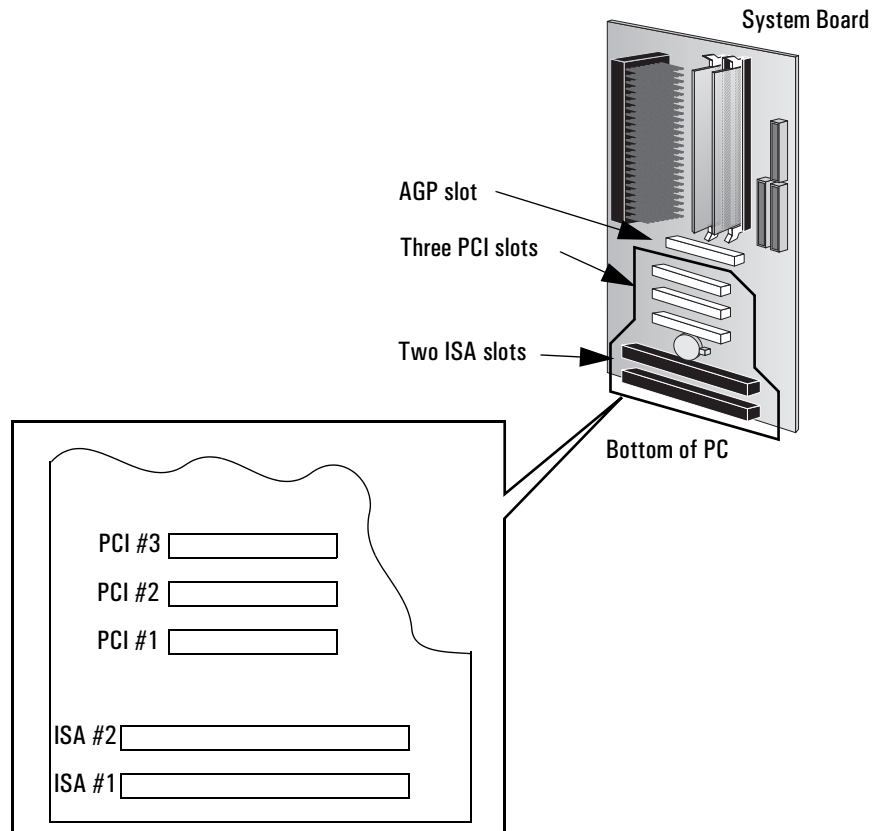
- 9 Install any other accessories before replacing the front bezel and cover. Reconnect all cables and power cords.
- 10 Verify the new configuration by viewing the summary screen (press Esc while the *Vectra* logo is displayed during system startup).

Installing Accessory Boards

CAUTION

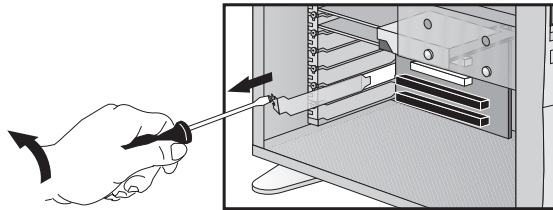
Static electricity can damage electronic components. Turn OFF all equipment. Don't let your clothes touch the accessory. To equalize the static electricity, rest the accessory bag on top of the computer while you are removing the accessory from the bag. Handle the accessory as little as possible and with care.

Your PC has one AGP (Accelerated Graphics Port) slot (for the video card), two ISA (Industry Standard Architecture) slots, and three PCI (Peripheral Component Interface) slots:

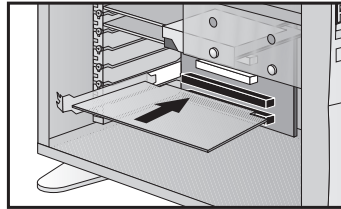


Installing an Accessory Board

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 Find a free slot. Some boards may have preferred locations and special installation instructions detailed in their manuals.
- 4 Unscrew the slot cover's retaining screw and remove the slot cover. Keep the screw, you will need it later. Store the slot cover in a safe place.



- 5 Hold the board by its "top" edge, and slide it into the board guide of the chosen slot. If you need to, loosen the retaining screws on the adjacent slots.



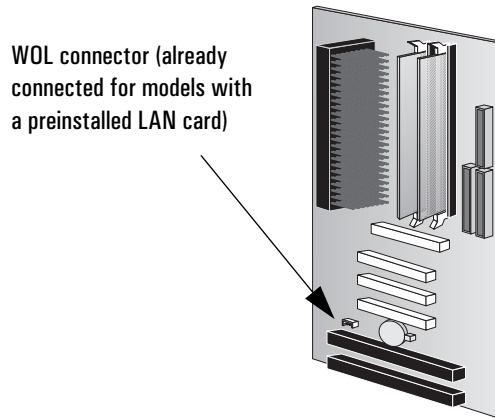
- 6 Align the board's connector with the slot's socket and firmly press the board into the socket. Do not bend the board. Ensure the board's connector engages completely with the socket and does not touch components on other boards.
- 7 Secure the board by replacing the retaining screw. If you loosened any of the retaining screws on adjacent slots, remember to tighten them.

2 How to Install Accessories in Your Minitower PC

Installing Accessory Boards

- 8 The accessory board may need a special connection, such as:
- Network cable to the WOL (Wake On LAN) connector.
 - Sound cable to the CD-ROM drive.

The following figure shows the location of the WOL connector.



For more information, refer to the documentation that came with the accessory board. The necessary cables are usually provided with the accessory board.

- 9 Install any other accessories before replacing the cover. Reconnect all cables and power cords.

NOTE

If you install a network board and connect it to the WOL connector, you must enable the **Wake On LAN** field in the *Setup* program (**Advanced - Power Management Setup**) if the network board supports this mode.

After you have installed certain types of accessory, for example, a network board, you must reinstall Service Pack 3 (Windows NT 4.0 only). You must also reinstall the drivers for the video card. You can download the correct drivers from HP's Web site at: <http://www.hp.com/go/vectrasupport/>.

Configuring Accessory Boards with Plug and Play

Plug and Play is an industry standard for automatically configuring your PC's hardware resources and the accessory boards installed in it. Your PC has configurable support for Plug and Play in the BIOS.

All PCI accessory boards are Plug and Play, although not all ISA boards are. Check the accessory board's documentation if you are unsure.

When you start your PC after installing an accessory board, the Plug and Play BIOS automatically detects which hardware resources (IRQs, DMAs, memory ranges, and I/O addresses) are used by the system-based components.

Windows 95

Operating systems that support Plug and Play, such as Windows 95, will automatically detect a newly installed Plug and Play accessory board and install the driver for this device, if the driver is available. If the driver is not available, Windows 95 will prompt you to insert a floppy disk or CD-ROM that contains the driver.

Windows NT 4.0

For operating systems that do not support Plug and Play, such as Windows NT 4.0, refer to the operating system documentation for information about installing accessory boards.

In Windows NT 4.0, click the **Start** button then click **Help**. You can use the contents or index to find information about installing devices. Windows NT 4.0 helps you through the installation of devices such as modems and sound boards.

Configuring non-Plug and Play ISA Accessory Boards

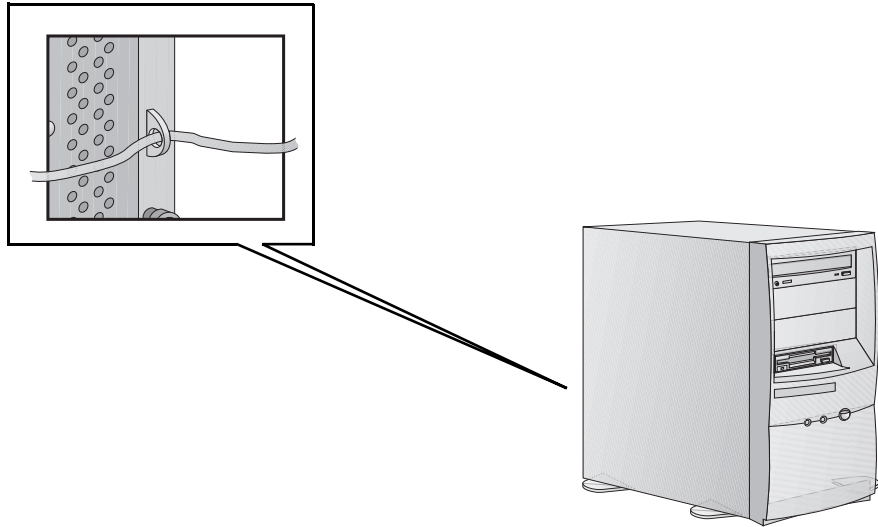
If you install an ISA accessory board that is not Plug and Play, you will need to configure the board before your PC can use it. For guidelines on available IRQs and I/O addresses in your PC, refer to page 88. Some operating systems, such as Windows 95, can display the IRQs and I/O addresses currently used by your PC. Refer to the operating system documentation for more information.

Refer to page 44 for information about accessory board slot numbers.

Refer to the documentation supplied with the operating system for details on your operating system's capabilities and restrictions concerning how to configure non-Plug and Play accessory boards.

Installing a Security Cable

You can secure the PC to your desk, or any other fixed object, using a security cable. The PC has a bracket at the rear for securing the cable.



NOTE

Contact your reseller for more information about ordering a security cable.

Changing the Battery

WARNING

There is a danger of explosion if the battery is incorrectly installed. For your safety, never attempt to recharge, disassemble, or burn the old battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. The battery is a lithium battery which does not contain heavy metals. Nevertheless, in order to protect the environment, do not dispose of batteries in household waste. Please return used batteries to the shop from which you bought them, or to the dealer from whom you purchased your PC Workstation, or to HP, so that they can be either recycled or disposed of in an environmentally sound way. Returned batteries will be accepted free of charge.

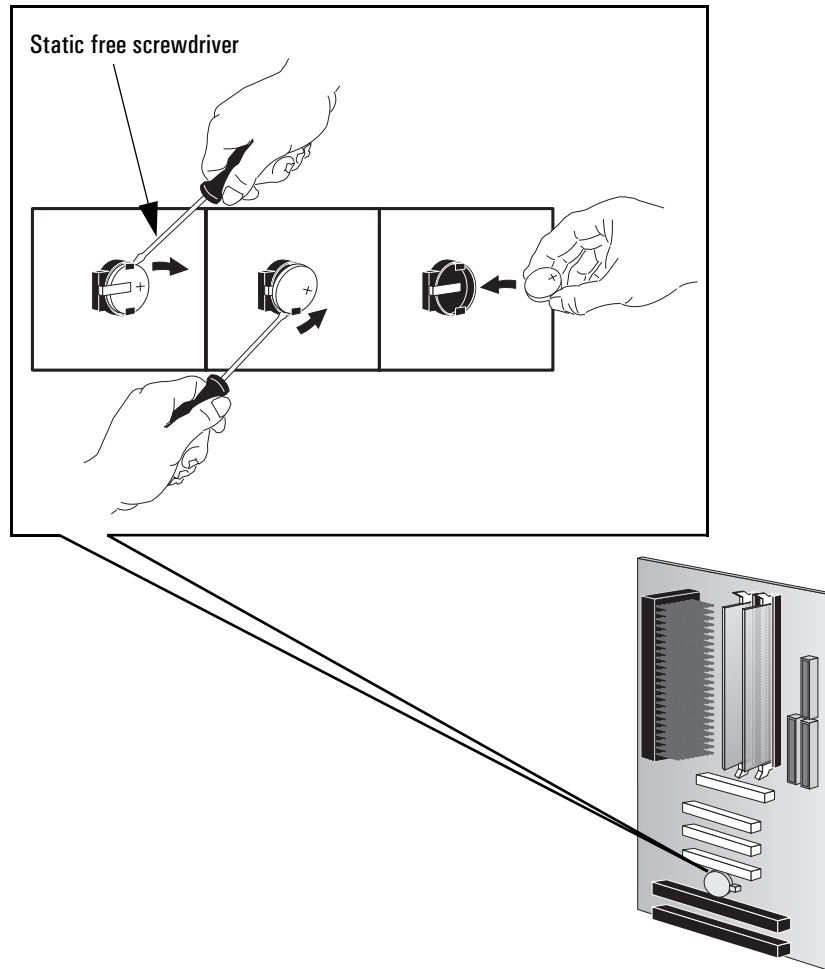
If your PC repeatedly loses its configuration settings you should consider changing the battery. Replace it with a CR2032 coin type manganese/lithium battery, available from most PC stores.

To change the battery:

- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 Remove the old battery by sliding it from under the retaining clip.
- 4 Place the new battery in the battery holder and ensure that it is properly seated. Ensure that the clip holds the battery firmly in place.

2 How to Install Accessories in Your Minitower PC

Changing the Battery



5 Replace the cover. Reconnect all cables and power cords.

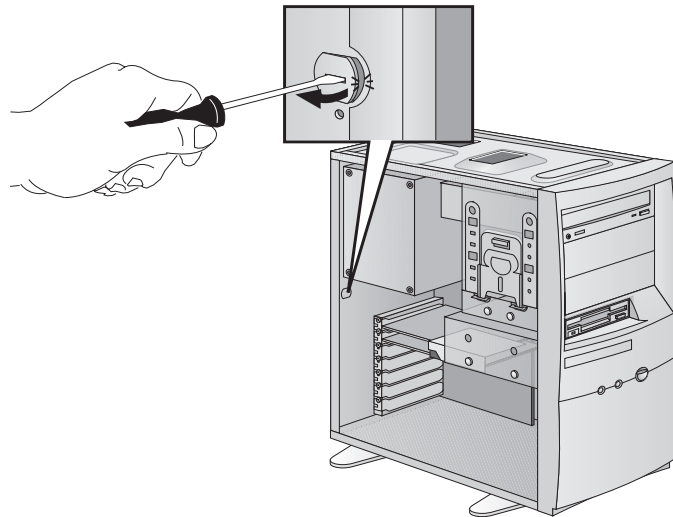
6 Run the *Setup* program to reconfigure the PC.

Installing a Key Lock

Your PC may have the facility to have a key lock installed.

To Install a Key Lock

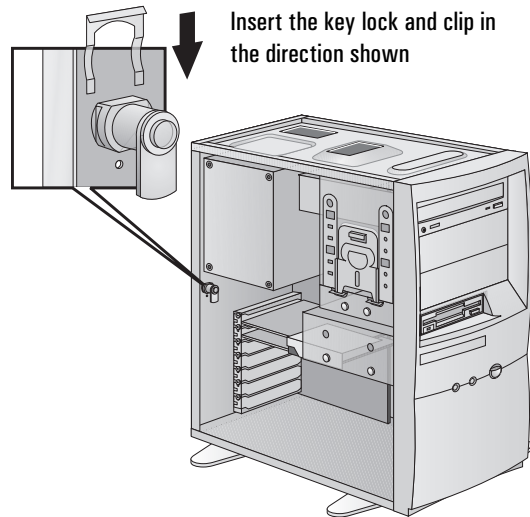
- 1 Disconnect the computer's power supply cord and any connection to a telecommunications network.
- 2 Remove the computer's cover.
- 3 Using a screwdriver, remove the small round metal filler from the PC's chassis.



- 4 Insert the key lock and secure it in position using the clip provided.

2 How to Install Accessories in Your Minitower PC

Installing a Key Lock



5 Replace the cover. Reconnect all cables and power cords.

Security Features

This chapter explains how to use the security features of your PC.

Setting Passwords

Your PC has two types of passwords:

- BIOS passwords.

You can set two passwords, the Administrator password and the User password, to provide two levels of protection for your PC. You set both passwords via the **Security** menu of the *Setup* program.

- Software passwords.

Operating systems such as Windows NT 4.0 and Windows 95 have a password facility. Refer to your operating system documentation for more information.

Using BIOS Passwords

You can only set a User password if you have already set an Administrator password. Both User and Administrator passwords can be used as power-on passwords or to protect the PC's setup configuration (via the *Setup* program). If passwords have been set, to have full access to the configuration settings in the PC's *Setup* program, you must use the Administrator password. The User password provides only limited access.

The **Password Check** item in the **Security** menu controls whether the PC checks for passwords every time you start the PC, or only when you attempt to access the *Setup* program.

Setting the Administrator Password

To set an Administrator password:

- 1 Start the *Setup* program (press **F2** during the startup procedure).
- 2 Choose the **Security** menu.
- 3 Choose the **Set Administrator Password** setup item. You will be asked to enter your password twice. Save your changes when you exit the *Setup* program by selecting **Exit**, then **Exit Saving Changes**.

To remove the password, follow the same procedure as to set a password. You will be asked to enter the existing password first. Then, for the new password, leave the password field blank and press

 Enter

NOTE

If you forget your password, refer to page 70.

3 Security Features

Setting Passwords

Setting the User Password

A User password can only be set if an Administrator password has already been set.

If you enter the *Setup* program by using the User password, you will be restricted in your ability to change setup items. If you enter the *Setup* program with an Administrator password, you will have no restrictions.

To set a User password:

- 1 Start the *Setup* program (press **F2** during the startup procedure).
- 2 Select the **Security** menu.
- 3 Choose the **Set User Password** setup item. You will be asked to enter your password twice. Save your changes when you exit the *Setup* program by selecting **Exit**, then **Exit Saving Changes**.

To remove the password, follow the same procedure as to set a password. You will be asked to enter the existing password first. Then, for the new password, leave the password field blank and press

.

NOTE

If you forget your password(s), refer to page 70.

Troubleshooting Your PC

This chapter can help you solve problems that you may encounter when using your PC. If you are unable to solve your problem after following the advice in this chapter, refer to "Hewlett-Packard Support and Information Services", on page 90.

WARNING

When performing the procedures described in this chapter, remember to follow normal safety procedures, that is, always remove all power cords and any telecommunications cables from the PC before removing the cover.

If Your PC Does Not Start Properly

Symptom	Problem	Cause and Solution
PC does not start.	No power.	Refer to page 59.
PC's power indicator light works but the monitor remains blank.	No display.	Refer to page 60.
An error message/code appears when the PC is switched on.	Power-On-Self-Test has detected an error.	Memory error. Refer to page 61. Keyboard or mouse error. Refer to page 62. Floppy drive error. Refer to page 63. Hard disk or CD-ROM error. Refer to page 64. CMOS error. Refer to page 65. Serial or parallel port error. Refer to page 66. Other configuration problems. Refer to page 67. Beep code error. Refer to page 68.

Other Problems with Your PC

Problem	Cause and Solution
You cannot turn off the PC.	The PC is frozen in a power saving mode. Refer to page 69.
You have forgotten your password.	Refer to page 70.
The Wake On LAN feature does not work.	Refer to page 71.
There is an IRQ problem when you install a sound board.	The IRQ used by the sound board is conflicting with the IRQ used by another device. Refer to page 72.
The PC has an audio problem.	Refer to page 73.
The PC has a software problem.	Refer to page 74.

If There Is No Power

Problem	Check	How
PC does not start – the PC's power-on indicator is not illuminated.	PC power cord is correctly connected.	Connect the power cord to a grounded power outlet and the PC.
	PC power outlet is working.	Plug a light into the grounded power outlet and check it illuminates.
	PC voltage switch is correctly set.	<ul style="list-style-type: none"> • Disconnect the power cord. • Select the correct setting. • Reconnect the power cord. • Start the PC.
If the PC still does not start		
WARNING: for your safety, when the PC is open and switched on, do not touch any of the internal components with a screwdriver or other metal instrument.	Check if any of the internal devices are causing the problem.	<ul style="list-style-type: none"> • Disconnect the PC's power cord. • Open the PC. • Remove internal power connectors from all internal devices. • Reconnect the PC's power cord. • Reconnect the power connectors one by one to the internal devices to see which device is defective. • Contact HP Support or your authorized dealer.
If the PC still does not start		
	Check if the power supply unit is causing the problem.	<ul style="list-style-type: none"> • Replace the power supply unit by a known working power supply from another similar PC. • If the PC starts, contact HP Support or your authorized dealer, the power supply unit might need replacing.
If the problem persists, contact HP Support or your authorized dealer		

4 Troubleshooting Your PC

If There Is Nothing Displayed on the Screen

If There Is Nothing Displayed on the Screen

Problem	Check	How
PC's power indicator light and hard disk activity light work but the screen remains blank.	Display is correctly switched ON (LED is on).	Refer to the display's manual for an explanation of the LED signals (green, orange, or blinking).
	Display power cord is correctly connected.	Connect the power cord – ensure it is plugged into a grounded power outlet and the monitor.
	Display power outlet is working.	Plug a light into the grounded power outlet and check it illuminates.
	Whether you hear beeps when the PC starts.	Refer to the beep codes described on page 68.
If the monitor still does not work		
	Display brightness and contrast settings are correct.	Refer to the display's manual, as needed.
If the monitor still does not work		
	The video cable pins are not damaged.	<ul style="list-style-type: none">• Switch off and unplug the monitor.• Disconnect the video cable and straighten any bent pins.• Reconnect the video cable.• Switch on the display and see if it works.
If the monitor still does not work		
	The PC's video is working.	<ul style="list-style-type: none">• Replace the monitor by a known working monitor from another similar PC.• If the monitor starts, contact HP Support or your authorized dealer, the monitor might need replacing.
If the monitor still does not work		
	The PC's video board is working.	<ul style="list-style-type: none">• Disconnect the power cord.• Open the PC.• Install a known good video board.• Reconnect the power cord.• Reconnect the monitor to the video board.• If the monitor starts, inform HP Support or your authorized dealer that the video board might be defective.

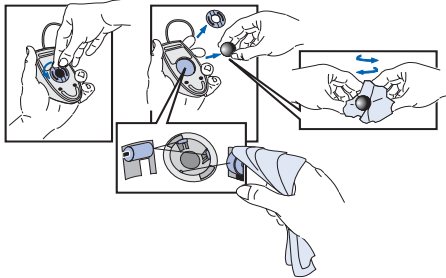
If There Is a Memory Test Error

Problem	Check	How
Power-On-Self-Test displays a memory test error.	PC's memory modules are correctly installed.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Check the memory modules are the correct type and in the correct sockets. • Refer to chapter 1 or 2, as needed. • Close the PC, reconnect the power cord and check that the PC boots (starts).
If the PC still does not boot		
	PC's memory modules are working.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Replace the memory modules by known good memory modules from a similar PC. • Refer to chapter 1 or 2, as needed. • Close the PC, reconnect the power cord and check that the PC boots (starts).
If the PC still does not boot		
	Check the system board is working.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Replace the system board by a known good board from a similar PC. • Close the PC, reconnect the power cord and check that the PC boots (starts). • If the PC works, contact HP Support or your authorized dealer for further troubleshooting information.
If the PC boots but you still have a problem		
	Run the PC's diagnostic tools software	Refer to page 82.
If the problem persists, contact HP Support or your authorized dealer		

4 Troubleshooting Your PC

If There Is a Keyboard or Mouse Test Error

If There Is a Keyboard or Mouse Test Error

Problem	Check	How
Power-On-Self-Test displays a keyboard or mouse test error.	Keyboard and mouse cables are correctly connected.	<ul style="list-style-type: none"> Switch off the PC. Plug the cables into the correct connectors on the back of the PC.
If the keyboard / mouse still do not work		
	<p>The keyboard is clean and no keys are stuck down.</p> <p>The mouse is clean.</p>	<ul style="list-style-type: none"> Check all keys are at the same height, and none are stuck (keyboard). Clean the mouse ball as shown below.
		
If the keyboard / mouse still do not work		
	The keyboard / mouse are working.	<ul style="list-style-type: none"> Switch off the PC. Replace the keyboard / mouse by known good units. Switch on the PC, and check it works.
If the keyboard / mouse still do not work		
	Check the system board is working.	<ul style="list-style-type: none"> Disconnect the power cord. Open the PC. Replace the system board by a known good board from a similar PC. Close the PC, reconnect the power cord and check that the PC boots (starts). If the keyboard/mouse works, contact HP Support or your authorized dealer for further troubleshooting information.
If the PC boots but you still have a problem		
	If the keyboard works under MS-DOS, check you have correctly configured the keyboard in Windows.	Run Windows Setup and check you chose the correct keyboard. (Refer to your Operating System documentation for details.)
	Run the PC's diagnostic tools software	Refer to page 82.
If the problem persists, contact HP Support or your authorized dealer		

If There Is a Floppy Disk Drive Test Error

Problem	Check	How
Power-On-Self-Test displays floppy drive test error.	The drive is correctly configured in the PC's <i>Setup</i> program.	<ul style="list-style-type: none"> • Switch the PC OFF then ON. • When the message F2 Setup appears, press the F2 key. • Check the floppy disk drive is enabled and the correct type is selected.
If the drive still does not work		
	Run the PC's diagnostic tools software from the hard disk.	Refer to page 82.
If the drive still does not work		
	The drive cables are correctly connected.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Check the floppy drive cables are correctly connected (refer to chapter 1 or 2). • Close the PC then switch it on and check it works.
	The drive cable is working.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Replace the floppy drive cable by a known good cable from a similar PC (refer to chapter 1 or 2). • Close the PC then switch it on and check it works.
If the drive still does not work		
	The diskette is working.	Insert a known good diskette and see if it works.
	The drive is working.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Replace the floppy drive by a known good drive from a similar PC (refer to chapter 1 or 2). • Close the PC then switch it on and check it works. • If the drive works, replace the defective drive.
	Check the system board is working.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Replace the system board by a known good board from a similar PC. • Close the PC, reconnect the power cord and check that the PC and drive work. • If the drive works, contact HP Support or your authorized dealer for further troubleshooting information.
If the problem persists, contact HP Support or your authorized dealer		

4 Troubleshooting Your PC

If There Is a Hard Disk or CD-ROM Drive Test Error

If There Is a Hard Disk or CD-ROM Drive Test Error

Problem:	Check:	How:
Power-On-Self-Test displays hard disk or CD-ROM drive test error	The drive is correctly configured in the PC's <i>Setup</i> program.	<ul style="list-style-type: none"> • Switch the PC OFF then ON. • When the message F2 Setup appears, press the F2 key. • Check the drive is enabled and the correct type is selected.
If the drive still does not work		
	Run the PC's diagnostic tools software from the floppy drive.	Refer to page 82.
If the drive still does not work		
	The drive cables are correctly connected.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Check the drive cables are correctly connected (refer to chapter 1 or 2). • Close the PC then switch it on and check it works.
	The drive cable is working.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Replace the drive cable by a known good cable from a similar PC (refer to chapter 1 or 2). • Close the PC then switch it on and check it works.
If the drive still does not work		
	The drive is working.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Replace the drive by a known good drive from a similar PC (refer to chapter 1 or 2). • Close the PC then switch it on and check it works. • If the drive works, contact HP Support or your authorized dealer for further troubleshooting information. Reinstall the drivers from the HP support Web site.
	Check the system board is working.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Replace the system board by a known good board from a similar PC. • Close the PC, reconnect the power cord and check that the PC and drive work. • If the drive works, contact HP Support or your authorized dealer for further troubleshooting information.
If the problem persists, contact HP Support or your authorized dealer		

If There Is a CMOS Test Error

Problem	Check	How
Power-On-Self-Test displays CMOS test error.	Power correctly connected to the system board.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Check the power connector is correctly attached to the system board. • Close the PC, reconnect the power cord and check that the PC boots (starts). <p>You may need to restore the default configuration settings. Refer to page 67</p>
If the PC still has a problem		
	The internal battery is working.	<ul style="list-style-type: none"> • Set the PC to the correct time (refer to the operating system manual). • Switch off and unplug the PC for an hour. • Restart the PC and check the time is correct. • If the time is incorrect, replace the PC's battery by a new one (refer to chapter 1 or 2).
	Check the system board is working.	<ul style="list-style-type: none"> • Disconnect the power cord. • Open the PC. • Replace the system board by a known good board from a similar PC. • Close the PC, reconnect the power cord and check that the PC works. • If the PC works, contact HP Support or your authorized dealer for further troubleshooting information.
If the problem persists, contact your authorized dealer		

4 Troubleshooting Your PC

If There Is a Serial or Parallel Port Test Error

If There Is a Serial or Parallel Port Test Error

Problem:	Check:	How:
Power-On-Self-Test displays a port test error.	The port is correctly configured in the PC's <i>Setup</i> program.	<ul style="list-style-type: none">• Switch the PC OFF then ON.• When the message F2 Setup appears, press the F2 key.• Check the port is enabled and the correct type is selected.
If the PC still has a problem		
	The PC by running the diagnostic tools software.	Refer to page 82.
	All connected devices are correctly connected and switched on.	<ul style="list-style-type: none">• Switch off the PC.• Plug the cables into the correct connectors on the back of the PC.• Switch on the PC and the external devices.
	The correct device drivers are installed.	Refer to the device documentation.
	Check the system board is working.	<ul style="list-style-type: none">• Disconnect the power cord.• Open the PC.• Replace the system board by a known good board from a similar PC.• Close the PC, reconnect the power cord and check that the PC works.• If the port works, contact HP Support or your authorized dealer for further troubleshooting information.
If the problem persists, contact your authorized dealer		

Other Configuration Problems

Problem	Check	How
Power-On-Self-Test displays an error (one that is not covered by an earlier section in this chapter).	<i>Setup</i> program settings.	<ul style="list-style-type: none"> • Turn on or restart the PC. • When the message F2 Setup appears, press the F2 key.
	Summary screen.	<ul style="list-style-type: none"> • Turn on or restart the PC. • When the message F2 Setup appears, press the ESC key. (Press the PAUSE key to keep the summary screen displayed. Press any key to continue.)
If the PC still displays an error		
The configuration settings are corrupted. Restore the default values.		<ul style="list-style-type: none"> • Turn off the PC and disconnect the power cord. • Remove the cover. • Set the system board switch 5 (Clear CMOS) to ON to clear the configuration. • Replace the cover, and reconnect the power cord. • Turn on the PC. This will erase the CMOS memory. • Wait until the PC has started. A message will be displayed saying that the configuration has been cleared. • Turn off the PC, disconnect the power cord, and remove the cover. • Set the system board switch 5 (Clear CMOS) on the switch block to OFF to re-enable the configuration. • Replace the cover, and reconnect the power cord. • Switch on the PC. The PC may start more slowly than usual because it will load the default configuration values. • Press F2 to enter the <i>Setup</i> program. Update the necessary fields, such as the date and time, then save and exit the <i>Setup</i> program. The PC will restart with the new configuration.

4 Troubleshooting Your PC

If There Is a Beep Code During Startup

If There Is a Beep Code During Startup

Problem		Cause	Solution
PC beeps during system startup	Number of Beeps		
	1	DRAM Refresh failure.	Try reseating the memory first. If the error still occurs, replace the memory with known good modules.
	2	Parity circuit failure.	
	3	Base 64 KB memory failure.	
	4	System timer failure.	Contact HP Support or your authorized dealer for further troubleshooting information.
	5	Processor failure.	
	6	Keyboard controller / Gate A20 failure.	Try reseating the keyboard controller chip. If the error still occurs, replace the keyboard chip (controller). If the error persists, check parts of the system relating to the keyboard. For example, try another keyboard, and check whether the system has a keyboard fuse.
	7	Virtual mode exception error.	Contact HP Support or your authorized dealer for further troubleshooting information.
	8	Display memory read/write failure. Indicates a memory error on the video board.	Replace the video board or the memory on the video board.
	9	ROM BIOS checksum failure. Indicates faulty BIOS chip(s).	It is unlikely that this error can be corrected by reseating the chips. Contact HP Support or your authorized dealer for further troubleshooting information.
	10	CMOS shutdown register read/write error.	Contact HP Support or your authorized dealer for further troubleshooting information.

If You Cannot Turn Off Your PC

Problem	Check	How
PC makes a buzzing or beeping sound when you press the power button.	Whether the PC is in a suspend/sleep mode, in which case a "power off" would risk a loss of information/data.	<ul style="list-style-type: none">• Move the mouse or press a key to try to wake up the PC. <p>If you cannot wake up the PC, and you still cannot turn it off using the power button, unplug the PC from the power supply.</p>
PC does <i>not</i> make a buzzing or beeping sound when you press the power button, but you are still unable to turn it off.	That you have saved all data and exited all programs.	<ul style="list-style-type: none">• Save all data and exit all programs (if you can).• Press the power button and keep it pressed for 5 seconds. The PC will turn off.

4 Troubleshooting Your PC

If You Have Forgotten Your Password

NOTE

Use these instructions if the passwords were set with the *Setup* program.

Problem	Solution
You have forgotten the User password.	<ul style="list-style-type: none">• Switch off the PC.• Restart the PC. If you are prompted for a password, enter the Administrator password.• When F2 Setup appears, press the F2 key.• Enter the Administrator Password to access the <i>Setup</i> program.• Go to the Security menu.• Go to the Set User Password field and set a new User Password. This will replace the old password which you had forgotten.• Press F3 to save the new Password and exit <i>Setup</i>.
You have forgotten the Administrator password.	<ul style="list-style-type: none">• Switch off the PC and remove the power cord.• Remove the computer's cover.• Set switch 6 on the system board switch block to ON.• Switch on the PC and allow it to complete its startup routine. A message is displayed.• Switch off the computer.• Reset switch 6 to OFF.• Replace the computer's cover.• Switch on the PC and allow it to complete its startup routine.• After the Power-On-Self-Test has completed, press F2 when prompted to use the <i>Setup</i> program.• Set new User and System Administrator Passwords.• Press F3 to save the new passwords and exit <i>Setup</i>.

If the Wake On LAN Feature Does Not Work

Problem	Solution
<p>You have installed a LAN board that supports the Wake On LAN feature and the feature does not work.</p>	<ul style="list-style-type: none">• Check that the Wake On LAN cable is correctly connected to the system board and to the LAN board. Refer to page 20 (if you have a desktop model) or page 46 (if you have a minitower model) for more information.• Refer to the LAN board documentation for instructions about installing and using the LAN board.• Check that the Wake On LAN field is set to enabled in the <i>Setup</i> program's Advanced - Power Management Setup menu. (You need to restart the PC and press the F2 key when F2 Setup appears).

4 Troubleshooting Your PC

If There Is an IRQ Problem Installing a Sound Board

If There Is an IRQ Problem Installing a Sound Board

Problem	Solution
You have installed a sound board and you get a message telling you that there is no IRQ (Interrupt Request) available for the sound board.	Check that you have followed the installation instructions provided with the sound board.
If there is still a problem	
	<ul style="list-style-type: none">• Restart the PC and press F2 when F2 Setup is displayed.• Reserve an IRQ for the ISA sound board. You can reserve IRQ 5, IRQ 9, IRQ 10 or IRQ 11 for this purpose. To do this, go to the Plug and Play Setup submenu of the Advanced menu and then set the chosen IRQ to ISA. Also, set the Plug and Play Aware O/S item to NO.• Press the F3 key to save the changes and quit the <i>Setup</i> program.• Redo the Windows NT installation procedure for the sound board.

NOTE

Plug and Play operating systems such as Windows 95 should, in normal circumstances, be able to allocate the IRQs that are used according to the hardware installed in the PC.

If Your PC Has an Audio (Sound) Problem

Problem	Solution
No sound when running any applications.	<p>If you are using Windows NT 4.0, check the volume, mute, and balance settings. Refer to the operating system documentation for more information.</p> <p>Absence of sound can also be caused by a hardware conflict. Hardware conflicts occur when two or more peripheral devices compete for the same signal lines or channels. Conflicts between your audio interface and another peripheral device might be due to the settings of the I/O addresses, IRQ channel, or DMA channel. To resolve the conflict, change the settings either of the audio interface or of any other ISA accessory in your system (refer to page 72).</p>
No output from the 8-bit or 16-bit digitized sounds.	This might be due to the DMA channel selected or to an interrupt conflict. Use your operating system's audio control software to change the audio interface's DMA channel or IRQ setting (refer to page 72).
Audio input from the microphone is too low, or no audio at all.	Check that the microphone specifications meet the requirements of the 16-bit sound components. The microphone should be a 600-ohm electret type.
Humming noise.	If the power grounding of your audio components is inadequate, a humming noise may be generated. Plug all devices into adjacent power outlets (outlets within 5 cm / 2 inches of each other), or use line filters.
Occasional crackles when playing back sounds.	These crackles are usually the result of your PC being unable to transfer audio samples within the required time. A solution is to use a lower sampling rate. Recording and playing back at 22 kHz is less demanding upon system resources than recording audio at 44 kHz.
The PC hangs while recording.	<p>Uncompressed digital audio can eventually fill your hard disk. For example, one minute of stereo sound recorded at a resolution of 44 kHz will occupy about 10.5 MB. Before recording, check that there is enough free space on your hard disk.</p> <p>Data compression can reduce the space required. The A-law and μ-law hardware compression used by the audio interface enables the sampling of sound at a resolution of 16-bits, but it generates the same quantity of data as an 8-bit sample.</p>

4 Troubleshooting Your PC

If Your PC Has a Software Problem

If Your PC Has a Software Problem

Problem	Solution
Power indicator light is illuminated, but some software won't run.	Refer to the application software documentation and/or the operating system documentation for guidance.
Date and time are wrong.	The date and time can be incorrect for the following reasons: <ul style="list-style-type: none"><li data-bbox="629 573 1079 602">• The time has changed to or from Summer Time.<li data-bbox="629 608 1193 667">• The PC has been unplugged from the power too long, and the battery is discharged. To change the date and time, use your operating system utilities or the <i>Setup</i> program.

Recovering Hard Disk Contents

In the unlikely event of a hard disk crash, you can recover all the software that was preloaded on your PC's hard disk when the PC was manufactured. You can recover, for example:

- The PC's operating system.
- Any HP-supplied drivers (for example, video, IDE and LAN).
- Any HP-designed manageability applications (for example, HP TopTools and HP DiagTools).

NOTE

Any software that has been installed on the PC after it was manufactured, and any personal data that has been generated by applications installed on the PC, are not covered by the recovery process.

Changing the Hard Disk

If the hard disk is corrupted and you can no longer use it, you should replace it with a new hard disk drive. Refer to the information given in earlier chapters of this guide for information about installing hard disk drives.

If the replacement hard disk drive is brand new, you will need to partition and format the drive. Refer to your operating system documentation for information about how to do this.

4 Troubleshooting Your PC

Recovering Hard Disk Contents

Recovering Software from a CD-ROM (Windows 95 and Windows NT Systems)

HP service personnel have a recovery CD-ROM containing the disk image of the HP Vectra VE as preloaded in the factory.

- 1 If there is not one already connected, connect a CD-ROM drive to the Master connector on the Secondary IDE cable.
- 2 Insert the Recovery CD-ROM in the CD-ROM drive.
- 3 Restart the PC and boot from the CD-ROM drive (set the CD-ROM as the boot device in the *Setup* program).
- 4 Follow the instructions displayed on the screen to restore the original disk image.

Recovering Software from a Second Hard Disk Drive (Windows NT Systems)

You can temporarily install a second hard disk drive on a spare IDE connector and then reinstall software from that hard disk drive to another hard disk drive. This second hard disk drive must contain the same disk image (ie the same operating system, drivers, and other preloaded software) as the original hard disk drive which you need to replace.

Copying Software from
One Hard Disk to
Another

- 1 Connect a bootable hard disk drive from another Windows NT model to a spare IDE connector, for example, the Slave IDE connector on the Primary IDE cable (assuming that this is free).
- 2 Boot from this new hard disk drive. Make sure that this drive is set as the 1st boot device in the *Setup* program (press **F2** while **Setup** is displayed).
- 3 If necessary, format the hard disk drive connected to the Master connector on the Primary IDE cable.
- 4 On the hard disk that is connected to the Master connector, create a MASTERS directory, a LANDRV directory, and an I386 directory. From the hard disk drive on the Slave connector, copy the contents of the I386 directory and LANDRV directory (if it exists) to the hard disk drive on the Master connector.

- 5 Remove the hard disk drive from the Slave connector. Put this hard disk drive back into the second HP Vectra VE PC.
- 6 Restart the PC.
- 7 Start the *Setup* program (press **F2** while **F2 Setup** is displayed), and set the drive that is on the Master connector on the Primary IDE cable as the boot device.
- 8 Install the operating system and HP-specific software (see below).

Installation of Windows NT4 SP3 and HP Software Components

These instructions presume that your HP Vectra VE has a bootable hard disk drive with at least the following directories:

i386	Contains Windows NT4. From this directory you can reinstall NT4 and Service Pack 3.
LANDRV	Contains the LAN drivers package.
MASTERS	Contains the master versions of the HP software.

NOTE

You should be able to download any drivers, etc. that you need from the HP Web site (<http://www.hp.com/go/vectrasupport>). After downloading, you can create an IDE and VIDEO directory in the MASTERS directory and copy the installation files to the respective directories. Follow the instructions in the readme files supplied with the IDE and the VIDEO drivers.

Installation of NT 4 and Service Pack 3

This section explains how to install Windows NT 4.0 Workstation and Service Pack 3 manually on an HP Vectra VE PC. We recommend that you install NT 4.0 in two stages:

- First, a basic installation using the generic system drivers supplied with Windows NT 4.0, without network installation.
- Second, after NT 4.0 Workstation is up and running, install the HP drivers to obtain full functionality, stability and performance for the hard disk(s), network and video.

4 Troubleshooting Your PC

Recovering Hard Disk Contents

The latest versions of all the drivers (and the corresponding installation notes) can be obtained from the HP Web site (<http://www.hp.com/go/vectrasupport>).

Basic Installation

This assumes you have either a CD-ROM drive connected to the PC or, preferably, you have restored the contents of the I386 directory as described earlier (with the SP3 subdirectory).

- 1 Install NT 4.0 by running WINNT with the /B option to avoid the use of flexible disks. Follow any instructions that are displayed.
- 2 When prompted for the type of file system, choose FAT or NTFS. Note that NTFS is 32-bit, can handle very large partitions but might cause problems for FAT type utilities.
- 3 In the second step after the first reboot called "Installing Windows NT Networking" skip the network installation during setup by selecting the option "Do not connect this computer to a network at this time".
- 4 Confirm the VGA compatible display adapter as video adapter at the end of the setup process.
- 5 After the reboot you will have a basic version of NT 4.0 installed.

OPTIONAL

If you install from CD-ROM, then you should copy the i386 directory from the CD-ROM to your HDD (it is approximately 78 MB). Also create an SP3 subdirectory to copy the Service Pack 3 software into.

Installing NT 4 Service Pack 3

The Service Pack 3 files are in the directory i386\Sp3\i386. If you're recreating the hard disk contents, create these directories and load all the files from SP3. If you don't have it, go to the Microsoft Web site and download this file (<http://www.microsoft.com>).

Run UPDATE.EXE and follow the instructions. Don't forget to make an uninstall directory (you will be prompted to do so in the Service Pack installation procedure).

Installation of HP Applications

- HP TopTools Download the HP TopTools installation software and *Implementation Guide* from the HP Manageability Web site (<http://www.hp.com/go/manageability>). Unpack the downloaded software and run the installation program.
- HP DiagTools Download the HP DiagTools installation software from the HP Web site (<http://www.hp.com/go/vectrasupport>). Refer to page 82 for more information about installing and using HP DiagTools.

Installation of Customer Specific Software

As the hard disk is now restored to its original HP preloaded format, you can now proceed with customer specific software. Don't forget to back up your hard disk.

Recovering from a BIOS Update Failure

If you attempt to update (flash) the BIOS in your PC and the update fails, perhaps due to a bad ROM image or a power failure during the update process, the PC will be left with a corrupted BIOS. To recover from this situation, you need to use the BootBlock procedure.

What is BootBlock? BootBlock is an area of the BIOS memory that is not erased during a standard BIOS update. It contains a minimal set of commands that bypass the normal boot procedure and “jump” directly to booting from the floppy disk.

CAUTION You should not use the BootBlock procedure as the normal method of updating the BIOS. Use it only as a recovery process.

BootBlock is loaded during manufacturing, and should never be updated.

Using the BootBlock feature To recover from a faulty BIOS you need to use a floppy disk containing the BIOS file HS0x0x.ROM, but renamed to AMIBOOT.ROM (you need to rename the file yourself).

To activate the BootBlock crisis recovery procedure:

- 1 Disconnect the computer’s power supply cord and any connection to a telecommunications network.
- 2 Remove the computer’s cover.
- 3 Set system board switches 5 (Clear CMOS) and 6 (Clear Passwords) to the On position.
- 4 Replace the cover and power cord.
- 5 Insert the floppy disk into the floppy disk drive.

- 6 While pressing **CTRL**+**HOME** switch on the PC. BootBlock loads the ROM file AMIBOOT.ROM from the floppy disk and flashes the BIOS. This takes several minutes. When the flashing is complete, the PC reboots automatically.
- 7 Shut down the PC and disconnect the PC's power cord.
- 8 Remove the cover and set switches 5 and 6 back to the Off position.
- 9 Replace the cover, reconnect all power cords and cables, remove the floppy disk from the floppy disk drive, and switch on the PC.

The PC should boot normally.

HP DiagTools

HP DiagTools is a utility that helps you diagnose hardware-related problems on HP Vectra PCs and PC Workstations. It is designed to help you to:

- Identify and report the configuration of your system.
- Diagnose hardware-related problems by running tests at two levels: basic and advanced.
- Provide precise information about the PC and test results to support personnel in your organization, at HP or your Authorized Support Provider, so that they can solve any problems quickly and effectively.

It is important that you use the latest version of this utility to diagnose hardware-related problems. HP Support Agents may request that you do so in the process of providing support.

The latest version of this utility can be obtained from HP Electronic Information Services, available 24 hours per day, 7 days per week. To access these services you should connect to the HP Web site at:

<http://www.hp.com/go/vectrasupport/>.

Starting The Diagnostics Utility

To start the Vectra Hardware Diagnostics utility:

- 1 Quit all applications, shut down the operating system and restart your PC.
 - a If you are going to run the utility from a diskette, insert it into the flexible disk drive before you restart the PC. On restarting, the utility will run automatically, displaying the Welcome screen.
 - b If you are going to run the utility from your hard disk drive, the PC will restart with the option to choose between your usual operating system and the utility. Select the Vectra Hardware Diagnostics option and it will start automatically, displaying the Welcome screen.

- 2 Press **F2** to continue and follow the instructions on screen to carry out the diagnostic tests.

This utility will automatically detect the complete hardware configuration of your system before any tests can be performed.

Basic System Tests To verify the correct operation of your system's hardware, you will need to carry out the Basic System Tests.

Advanced System Tests To perform more in-depth testing of your system's individual components, you will need to carry out the Advanced System Tests.

NOTE

The advanced test phase of this utility is suitable for intermediate and advanced users only.

Support Ticket To produce a complete record of your system's configuration and test results, you will need to create a Support Ticket. This can then be sent, via e-mail or fax, to your local or HP-dedicated Support Agent.

For more information on how to use this utility, refer to the Vectra Hardware Diagnostics *User's Guide*, available on the HP Web site at: **<http://www.hp.com/go/vectrasupport/>**.

Setting the Device Boot Order

To select the drive to start (boot) from, you must enter the *Setup* program and go to **Advanced - Advanced CMOS Setup**. You can then select the 1st, 2nd, 3rd, and 4th Boot Devices. Connecting a hard disk drive to the IDE master connector *does not* ensure that the PC will boot on that hard disk drive.

NOTE

The first time you start your PC, the PC will by default boot from the hard disk drive connected to the Master IDE connector on the Primary IDE cable (IDE-0).

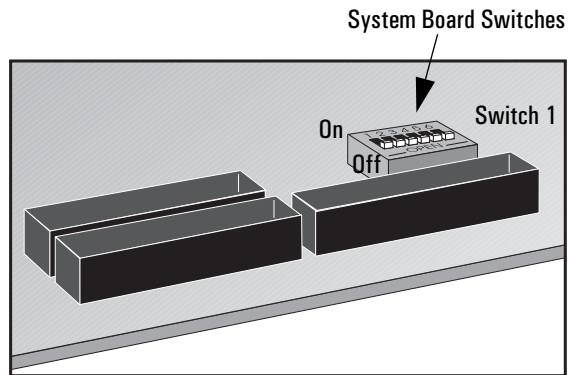
The drive positions on the two IDE cables are:

Cable	Connector	BIOS ID (in <i>Setup</i> Program)
Primary IDE	Master	IDE-0
Primary IDE	Slave	IDE-1
Secondary IDE	Master	IDE-2
Secondary IDE	Slave	IDE-3

When booting from a different hard disk drive, make sure you know its physical position on the cable.

Technical Information

System Board Switches



Switch	Switch function
1 - 4	Processor speed, see next table
5	CMOS: Off = normal (default) On = clear CMOS and reload default values in <i>Setup</i>
6	Password: Off = enabled (default) On = disabled / clear User and Administrator passwords

Processor Frequency	Switch 1	Switch 2	Switch 3	Switch 4
233	Off	Off	On	On
266	On	On	Off	On
300	Off	On	Off	On
333	On	Off	Off	On

4 Troubleshooting Your PC

Technical Information

Power Consumption

Power Consumption (Windows NT)	115 V / 60 Hz	230 V / 50 Hz
Operating with input/output	34.1 W	35 W
Operating without input/output	34 W	34.8 W
Standby	23 W	23.4 W
Off	2.36 W	2.37 W

V-standby power: 720 mA

NOTE

When the PC is turned off with the power button on the front panel, the power consumption falls below 5 Watts, but is not zero. The special on/off method used by this PC considerably extends the lifetime of the power supply. To reach zero power consumption in “off” mode, either unplug the PC from the power outlet or use a power block with a switch.

Maximum Power Consumption/Availability per ISA Accessory Slot

+5 V	3A limit per slot (limited by system board)
+12 V	0.8A limit per slot (limited by system board)
-5 V	0.05A total power limit (limited by power supply)
-12 V	0.1A total power limit (limited by power supply)

There is a maximum per-slot limit of 20 W between all supply rails.

Maximum Power Consumption/Availability per PCI Accessory Slot

+3.3 V	7.6A maximum per slot
+5 V	5A maximum per slot
+12 V	0.5A maximum per slot
-12 V	0.1A maximum per slot

There is a maximum per-slot limit of 25 W between all supply rails.

NOTE

There is a maximum of 95 W available for all accessory slots.

Acoustic Noise Emission

Acoustic Noise Emission	Sound Power	Sound Pressure
Operating	LwA < 40 dB	LpA < 28 dB
Operating with HDD access	LwA < 41 dB	LpA < 32 dB
Operating with FDD access	LwA < 43 dB	LpA < 37 dB

Physical Characteristics

Desktop

Characteristic	Description
Weight (excluding display and keyboard)	9.9 kg (21.78 pounds)
Dimensions	Width: 43.18 cm (17 inches) Height: 17 cm (6.69 inches) Depth: 43 cm (16.93 inches)
Footprint	0.175 m ² (1.88 ft ²)
Storage temperature	-20 °C to 60°C (-4 °F to 140 °F)
Storage humidity	8% to 80% (relative), non-condensing at 40°C (104 °F)
Operating temperature	5 °C to 35 °C (41 °F to 95 °F)
Operating humidity	15% to 80% (relative)
Power supply	Input voltage: 100 - 127 V ac / 200 - 240 V ac (all models have voltage selection switch) Input frequency: 45/66 Hz Maximum output power: 145 W continuous

Minitower

Characteristic	Description
Weight (excluding display and keyboard)	9.8 kg (21.56 pounds)
Dimensions	Width: 19 cm (7.48 inches) Height: 40 cm (15.75 inches) Depth: 45.2 cm (17.80 inches)
Footprint	0.0817 m ² (0.879 ft ²)
Storage temperature	-20 °C to 60° (-4 °F to 140 °F)
Storage humidity	8% to 80% (relative), non-condensing at 40 °C (104 °F)
Operating temperature	5 °C to 35 °C (41 °F to 95 °F)
Operating humidity	15% to 80% (relative)
Power supply	Input voltage: 100 - 127 V ac / 200 - 240 V ac (all models have voltage selection switch) Input frequency: 45/66 Hz Maximum output power: 145 W continuous

4 Troubleshooting Your PC

Technical Information

IRQs, DMAs, and I/O Addresses Used by Your PC

IRQs used by PC The IRQ, DMA, and I/O address mappings shown here are for guidance only. The resources used by your PC may vary, depending upon which accessory boards are installed in the PC.	IRQ0	PIIX4e system timer
	IRQ1	NS309 keyboard controller
	IRQ2	Cascade
	IRQ3	NS309 COM2, COM4
	IRQ4	NS309 COM1, COM3
	IRQ5	Free
	IRQ6	NS309 flexible disk drive controller
	IRQ7	NS309 LPT
	IRQ8	PIIX4e RTC
	IRQ9	Free (if not used by video card)
	IRQ10	Free (if not used by onboard USB controller)
	IRQ11	NS309 keyboard controller
	IRQ12	NS309 mouse
	IRQ14	PIIX4e IDE channel 1
	IRQ15	PIIX4e IDE channel 2
DMAs used by PC	DMA 0	free
	DMA 1	free
	DMA 2	NS309 flexible disk drive controller
	DMA 3	NS309 LPT ECP
	DMA 4	used to cascade DMA channels 0-3
	DMA 5	free
	DMA 6	free
	DMA 7	free

I/O Addresses used by PC	<p>0000 - 000F DMA controller 1</p> <p>0020 - 0021 Master interrupt controller (8259)</p> <p>002E - 002F NS309 Configuration registers</p> <p>0040 - 0043 Timer 1</p> <p>0060, 0064 Keyboard controller (reset, slow A20)</p> <p>0061 Port B (speaker, NMI status and control)</p> <p>0070 Bit 7: NMI mask register</p> <p>0070 - 0071 RTC and CMOS data</p> <p>0080 Manufacturing port (POST card)</p> <p>0081 - 0083, 008F DMA low page register</p> <p>0092 PS/2 reset and Fast A20</p> <p>00A0 - 00A1 Slave interrupt controller</p> <p>00C0 - 00DF DMA controller 2</p> <p>00F0 - 00FF Co-processor error</p> <p>0170 - 0177 IDE secondary channel</p> <p>01F0 - 01F7 IDE primary channel</p> <p>0278 - 027F LPT 2</p> <p>02E8 - 02EF Serial port 4 (COM4)</p> <p>02F8 - 02FF Serial port 2 (COM2)</p> <p>0372 - 0377 IDE secondary channel, secondary flexible disk drive</p> <p>0378 - 037A LPT1</p> <p>03B0 - 03DF VGA</p> <p>03E8 - 03EF COM3</p> <p>03F0h- 03F5 Flexible disk drive controller</p> <p>03F6 IDE primary channel</p> <p>03F7 Flexible disk drive controller</p> <p>03F8 - 03FF COM1</p> <p>04D0 - 04D1 Interrupt edge/level control</p> <p>0678 - 067B LPT2 ECP</p> <p>0778 - 077B LPT1 ECP</p> <p>0CF8 - 0CFF PCI configuration space</p>
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Hewlett-Packard Support and Information Services

Hewlett-Packard computers are engineered for quality and reliability to give you many years of trouble-free service. To ensure that your computer system maintains its reliability and to keep you up-to-date with the latest developments, HP and a worldwide network of trained and authorized resellers provide a comprehensive range of service and support options.

To learn more about these service and support options, please connect to the HP Web site at:

`http://www.hp.com/go/vectra/`

or go directly to support at:

`http://www.hp.com/go/vectrasupport/`.

HP's Web site has a vast range of information about HP products, services and support, including:

- Description of HP's services and support options.
- Support documentation for your PC in HTML format.
- The MIS kit for your PC, which contains the full set of documentation for your PC (refer to page vi for details).
- Drivers and software for your PC.

Index

A

accessory boards
 configuring, 21, 22, 47
 installing, 18, 44
acoustic noise emission, 86
administrator password, setting, 55
audio problems, 73

B

battery, changing, 24, 49
beep codes, 68
BIOS, update failure, 80

C

CD-ROM drive
 installing, 13, 40
 POST error, 64
CMOS
 clearing the configuration, 67
 POST error, 65
configuring
 accessory boards, 21, 22, 47
 IDE devices, 9, 36
connecting, IDE devices, 7, 34
cover
 removing, 3, 29
 replacing, 4, 30

D

device boot order, 84
DMAs, used by PC, 88

F

floppy disk drive, POST error, 63

H

hard disk drive
 contents lost, 75
 installing, 10, 37
 POST error, 64
Hewlett-Packard support, 90
HP DiagTools, 82

I

I/O addresses, used by PC, 88
IDE devices
 configuring, 9, 36
 connecting, 7, 34
installing
 accessory boards, 18, 44

CD-ROM drive, 13, 40
hard disk drive, 10, 37
key lock, 26, 51
mass storage devices, 7, 34
memory, 5, 32
security cable, 23, 48
tape drive, 13, 40
Zip drive, 13, 40

IRQ

conflict, 72
used by PC, 88

K

key lock, installing, 26, 51
keyboard, POST error, 62

M

mass storage devices, installing, 7, 34
memory
 installing, 5, 32
 POST error, 61
mouse, POST error, 62

P

parallel port, POST error, 66
passwords
 administrator, 55
 BIOS, using, 54
 forgotten, 70
 setting, 54
 user, 56
PC

 cannot turn off, 69
 no power, 59
 nothing displayed on the screen, 60
 physical characteristics, 87
 power consumption, 86
 power supply unit
 removing, 31
 replacing, 31
problems
 audio, 73
 beep code, 68
 BIOS update failure, 80
 cannot turn PC off, 69
 CD-ROM drive, 64
 CMOS, 65
 floppy disk drive, 63
 hard disk contents lost, 75
 hard disk drive, 64

IRQ conflict, 72
keyboard, 62
memory test error, 61
mouse, 62
no power, 59
nothing displayed on the screen, 60
parallel port, 66
passwords, forgotten, 70
serial port, 66
software, 74
Wake-On LAN does not work, 71

R

recover
 BIOS update crash, 80
 hard disk contents, 75
removing
 cover, 3, 29
 power supply unit, 31
replacing
 cover, 4, 30
 power supply unit, 31

S

security cable, installing, 23, 48
serial port, POST error, 66
setting passwords, 54
software problems, 74
support, Hewlett-Packard, 90
system board switches, 85

T

tape drive, installing, 13, 40
technical information
 acoustic noise emission, 86
 DMAs, 88
 I/O addresses, 88
 IRQs, 88
 physical characteristics, 87
 power consumption, 86
 system board switches, 85

U

user password, setting, 56

W

Wake-On LAN does not work, 71

Z

Zip drive, installing, 13, 40

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