Personal Computer

Installing Options in Your Personal Computer

PC 300PL Type 6892
PC 300GL Type 6285

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PC 300PL Type 6892
PC 300GL Type 6285

IBM

┌─ **Note** ──┐

Before using this information and the product it supports, be sure to read the general information
under Appendix D, "Notices" on page 78.

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Contents

Safety Information

⚠ **DANGER:**

Electrical current from power, telephone, and communication cables is hazardous. To avoid shock hazard, connect and disconnect cables as shown below when installing, moving or opening the covers of this product or attached devices. The power cord must be used with a properly grounded outlet.

To Connect	To Disconnect
Turn everything OFF.	Turn everything OFF.
First, attach all cables to devices.	First, remove power cord from outlet.
Attach signal cables to receptacles.	Remove signal cables from receptacles.
Attach power cord to outlet.	Remove all cables from devices.
Turn device ON.	

v
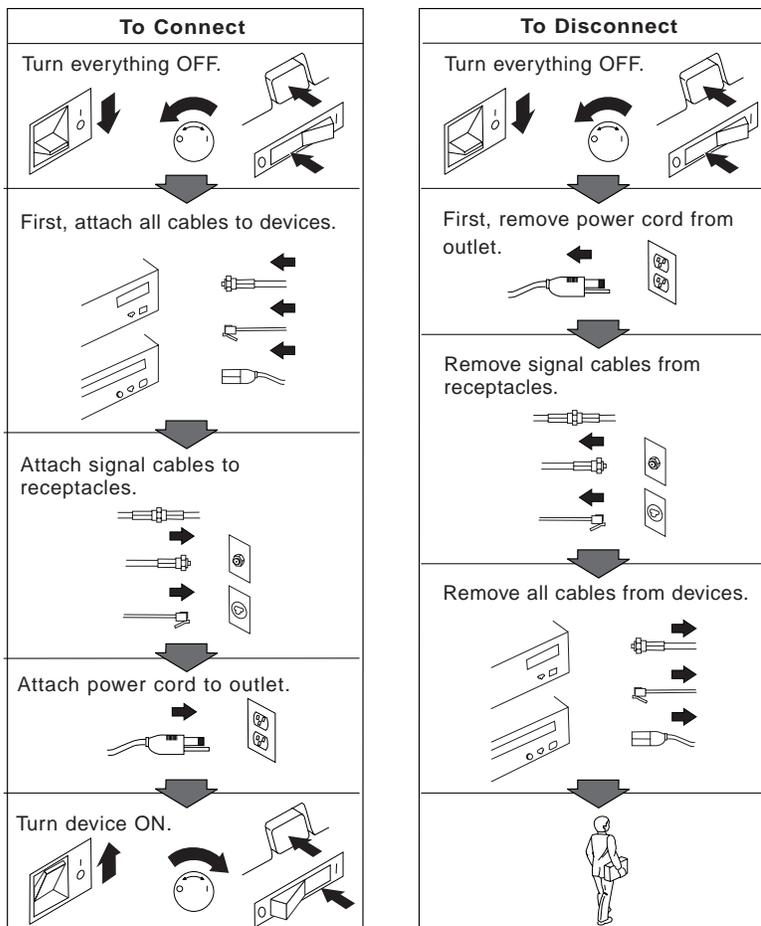
Laser compliance statement

Some IBM Personal Computer models are equipped from the factory with a CD-ROM drive. CD-ROM drives are also sold separately as options. The CD-ROM drive is a laser product. The CD-ROM drive is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 825 and CENELEC EN 60 825 for Class 1 laser products.

When a CD-ROM drive is installed, note the following.

CAUTION:
Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

Removing the covers of the CD-ROM drive could result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive. **Do not remove the CD-ROM drive covers.**

Some CD-ROM drives contain an embedded Class 3A or Class 3B laser diode. Note the following.

DANGER

> **Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.**

Lithium battery notice

CAUTION:
Danger of explosion if battery is incorrectly replaced.

When replacing the battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

Dispose of the battery as required by local ordinances or regulations.

ATTENTION
Danger d'explosion en cas de remplacement incorrect de la batterie.

Remplacer uniquement par une batterie IBM de type 33F8354 ou d'un type équivalent recommandé par le fabricant. La batterie contient du lithium et peut exploser en cas de mauvaise utilisation, de mauvaise manipulation ou de mise au rebut inappropriée.

Ne pas :

- **Lancer ou plonger dans l'eau**
- **Chauffer à plus de 100°C (212°F)**
- **Réparer ou désassembler**

Mettre au rebut les batteries usagées conformément aux règlements locaux.

About This Book

Thank you for selecting an IBM Personal Computer.
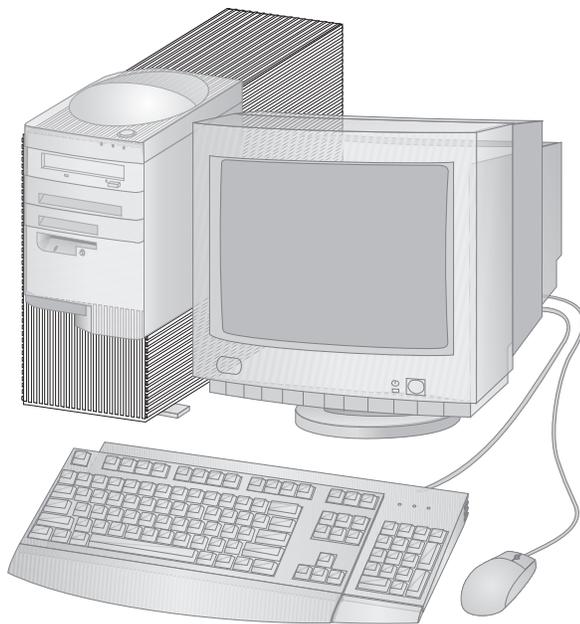
This book provides instructions for installing, removing, and replacing most options. Also, this book contains information to help you decide which options to add to your computer.

This publication provides information for the PC 300PL and the PC 300GL. Some illustrations in this publication might be different from your hardware.

How This Book Is Organized

This book contains the following chapters and appendixes:

- Chapter 1, "Overview" provides an introduction to the options and features for your computer. Safety precautions and handling techniques are discussed along with the required tools you will need to install and remove options.

- Chapter 2, "Preparing to Install or Remove Options" provides instructions for removing the cover and cables for your computer and for locating components.

- Chapter 3, "Working with Options on the System Board" provides instructions for locating, accessing, and working with options on the system board.

- Chapter 4, "Working with Adapters" provides instructions for installing and removing adapters.

- Chapter 5, "Working with Internal Drives" provides instructions for installing and removing internal drives.

- Chapter 6, "Working with Security Options" describes features such as the security U-bolt and erasing lost or forgotten passwords.

- Chapter 7, "Completing the Installation" provides instructions for reassembling your computer after you have finished installing options. Information about using the Configuration/Setup Utility program is also provided.

- Appendix A, "Cover and Component Removal Information" provides important information for the PC 300PL. If you have a PC 300PL model, and have set an administrator password, read this section before removing the computer cover or internal components.

- Appendix B, "Changing the Battery" explains how to change your computer backup battery and the precautions to take when handling and disposing of the battery.

- Appendix C, "Interrupt and DMA Resources" contains the default interrupt and direct memory access (DMA) resources for your computer.

- Appendix D, "Notices" contains IBM notices and trademark information.

Related Publications

The following publications, together with this book, contain information about your computer.

- *Using Your Personal Computer*
  This publication contains the following:

  - Instructions for configuring, operating, and maintaining your computer
  - Information on diagnosing and solving computer problems and how to get help and service
  - Warranty information

- *Understanding Your Personal Computer*
  This online publication includes general information about using personal computers and in-depth information about the specific features of your computer.

- *About Your Software*
  This publication (provided only with computers that have IBM-preinstalled software) contains information about the preinstalled software package.

The following publications contain more information about your computer.

- *Hardware Maintenance Manual*
  This publication contains information for trained service technicians. To obtain a copy, refer to the section on ordering publications in the "Getting Help, Service, and Information" chapter in *Using Your Personal Computer*. It is also available on the World Wide Web at:

  `http://www.ibm.com/pc/us/cdt/hmm.html`

- *Technical Information Manual*
  This publication contains more information about the technical aspects of your computer. It is available on the World Wide Web at:

  `http://www.ibm.com/pc/us/cdt/treport.html`

Chapter 1. Overview

Adding hardware options to your computer is an easy way to increase its capabilities. Instructions for removing, installing, and replacing options are included in this book. When adding an option, use these instructions along with the instructions that come with the option. If you have installed options before, you might be able to perform some activities without detailed instructions.

This chapter provides a brief introduction to the options and features that are available for your computer. Also, important information about required tools, electrical safety, and static-sensitive devices is included.

Important

Before you install or remove any option, read the safety procedures and component-handling guidelines in this chapter. These precautions and guidelines will help you work safely.

See *Using Your Personal Computer* for general information on the use, operation, and maintenance of your computer. *Using Your Personal Computer* also contains information to help you solve problems and get repair service or other technical assistance.

Available Options and Features

The following are some of the available options and features discussed in this book:

- System board components

    - System memory, called dual in-line memory modules (DIMMs)
    - Video memory (some models only)
    - Microprocessor
    - Jumper for clearing CMOS and erasing lost or forgotten passwords
    - Battery

- Adapters

    - Industry standard architecture (ISA) adapters
    - Peripheral component interconnect (PCI) adapters
    - Accelerated graphics port (AGP) adapter (some models only)

- Internal drives

    - CD-ROM
    - Hard disk

- Security U-bolt

The following are some other available options and features for your computer. For more information, refer to the documentation that comes with the optional hardware.

- If your computer does not have an Ethernet connector, you can add a *Wake on LAN* adapter.

- In addition to other power management features, you can add a modem and have your computer start when a ring is detected by the modem. Using an internal modem, you can use the Configuration/Setup Utility program to enable *Modem Ring Detect*, or using an external modem, you can enable *Serial Port Ring Detect*. For more information on the Configuration/Setup Utility program, see *Using Your Personal Computer*.

IBM provides help in selecting drives, cables, and other options for your computer. For the latest information about available options:

- Within the United States, call 1-800-IBM-2YOU (1-800-426-2968), your IBM reseller, or IBM marketing representative.

- Within Canada, call 1-800-565-3344 or 1-800-465-7999.

- Outside the United States and Canada, contact IBM, your IBM reseller, or IBM marketing representative.

IBM maintains pages on the World Wide Web where you can get information about IBM products and services, find the latest technical information, and download device drivers and updates. Some of these pages are:

`http://www.ibm.com`	Main IBM home page
`http://www.ibm.com/pc`	IBM Personal Computer home page
`http://www.ibm.com/pc/us/cdt`	IBM Commercial Desktop home page
`http://www.ibm.com/pc/us/servers`	IBM PC Server and Netfinity Server home page
`http://www.ibm.com/pc/us/options`	IBM Options home page
`http://www.ibm.com/pc/us/intellistation`	IBM IntelliStation home page
`http://www.ibm.com/pc/us/thinkpad`	IBM ThinkPad home page

Tools Required

To install or remove options in your computer, you will need a flat-head screwdriver. Any additional tools needed depend on the specific option and are noted in the instructions that come with the option.

Electrical Safety

CAUTION:
Electrical current from power, telephone, and communication cables can be hazardous. To avoid any shock hazard, disconnect all power cords and cables as described in the following information.

Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the electrical outlet before opening the computer.

For your safety, always do the following *before* removing the cover:

1. Shut down all programs as described in your operating system documentation.

2. Turn off the computer and any attached devices, such as printers, monitors, and external drives.

   Note: Personal computer users in the United Kingdom who have a modem or fax machine attached to their computer must disconnect the telephone line from the computer *before* unplugging any power cords (also known as power cables). When the computer is reassembled, users must reconnect the telephone line *after* plugging in the power cords.

3. Unplug all power cords from electrical outlets.

4. Disconnect all communication cables from external receptacles.

5. Disconnect all cables and power cords from the back of the computer.

   Note: Do not reconnect any cables or power cords until you reassemble the computer and put the cover back on.

CAUTION:
Never remove the cover on the power supply. If you have a problem with the power supply, have your computer serviced.

Handling Static-Sensitive Devices

Have you ever walked across a carpeted floor, then touched an object and received a small electrical shock? That's static electricity, and although harmless to you, it can seriously damage computer components and options.

Important

When you add an option, do *not* open the static-protective package containing the option until you are instructed to do so.

When you handle options and other computer components, take these precautions to avoid static electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.

- Always handle components carefully. Handle adapters and memory modules by the edges. Never touch any exposed circuitry.

- Prevent others from touching components.

- When you are installing a new option, touch the static-protective package containing the option to a metal expansion-slot cover or other unpainted metal surface on the computer for at least two seconds. This reduces static electricity in the package and your body.

- When possible, remove the option and install it directly in the computer without setting the option down. When this is not possible, place the static-protective package that the option came in on a smooth, level surface and place the option on it.

- Do not place the option on the computer cover or other metal surface.

Chapter 2. Preparing to Install or Remove Options

This chapter provides instructions for accessing and locating the options you want to install or remove.

Disconnecting Cables and Removing the Cover

Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Remove any media (diskettes, compact discs, or tapes) from the drives, and then turn off all attached devices and the computer.
- If you plan to work with the computer in an upright position, ensure that the stabilizer feet on the bottom of the cover are positioned correctly. See "Using the Stabilizing Feet" on page 66 for more information.

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1 Unplug all power cords from electrical outlets. If you have a modem or fax machine attached to your computer, disconnect the telephone line from the wall outlet and the computer.

2 Disconnect all cables attached to the computer; this includes power cords, input/output (I/O) cables, and any other cables connected to the computer.
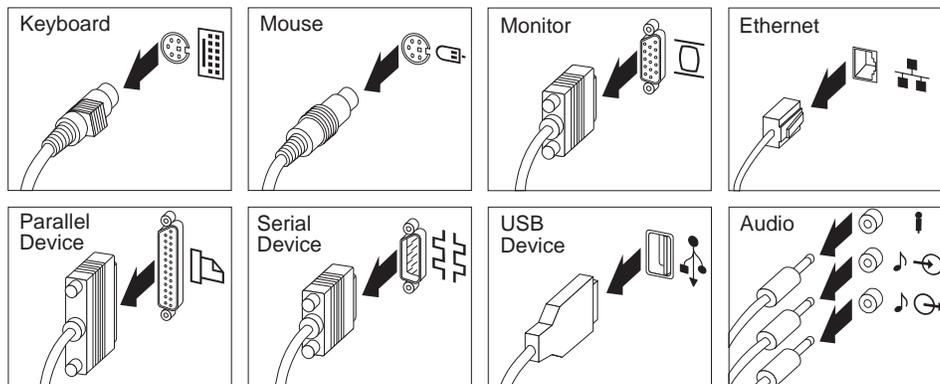
Note: Your computer might not have all the connectors shown. Also, for more information on I/O ports, see *Understanding Your Personal Computer.*

Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the electrical outlet before opening the computer.

3 If a cover lock is present, unlock the computer cover. (The cover lock is located at the rear of the computer on some models.)
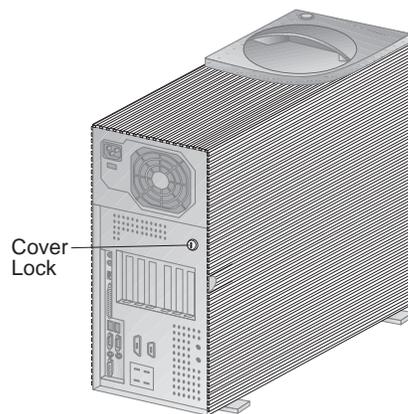
Attention

If your computer is a PC 300PL model and you have set an administrator password, read the important information in Appendix A, "Cover and Component Removal Information" on page 73 about the chassis-intrusion feature of the computer before removing the computer cover in steps 4 and 5.

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4 Locate the cover-release tab.

5 Pull out on the cover-release tab at the rear of the side cover and slide the cover toward the front of the computer. Lift the cover off.

Cover-
Release
Tab
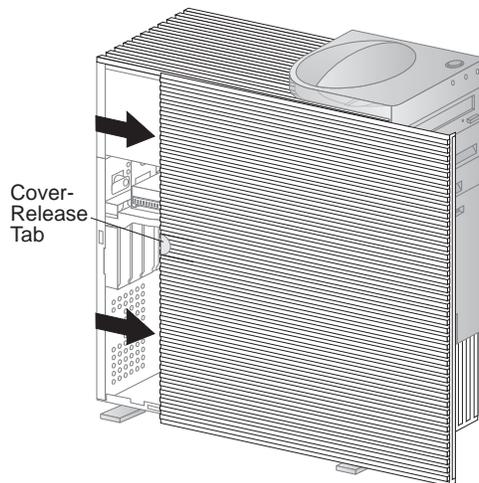
Important

When you need to access the inside of the computer, you might find it easier to lay the computer on its side. If you do so, you should rotate the feet in towards the computer, so they do not break off due to the weight of the computer.

If you access the inside of the computer while it is in upright position, ensure that the stabilizer feet are positioned correctly. For more information, see "Using the Stabilizing Feet" on page 66.

Locating Components

Use the following information to help locate components. Use it as a reference when you need to install options or connect input/output devices.

Internal View

The following illustration shows the internal view of your computer as seen from the front. For information on removing the cover, see "Disconnecting Cables and Removing the Cover" on page 5.

Note: The following illustration is for reference only. Your computer might differ from the one shown.

1	Drive cage for bays 1 through 4
2	System board
3	Riser card
4	Adapter card
5	Expansion slots
6	Drive Cage for Bays 5 and 6
7	Bay 6, hard disk drive
8	Bay 5
9	Power supply
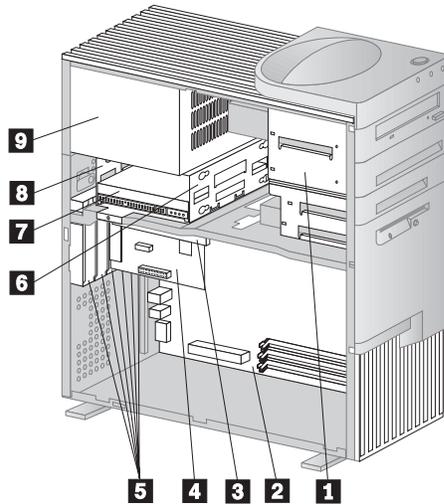
External View

The following illustration shows the external view of your computer as seen from the front.

Note: The following illustration is for reference only.

1	Power-on button
2	Power-on light
3	Hard disk drive light
4	Client LAN light[1]
5	Bay 1
6	CD-ROM eject button
7	CD-ROM emergency eject
8	Bay 2
9	Bay 3
10	Bay 4, 3.5" diskette drive

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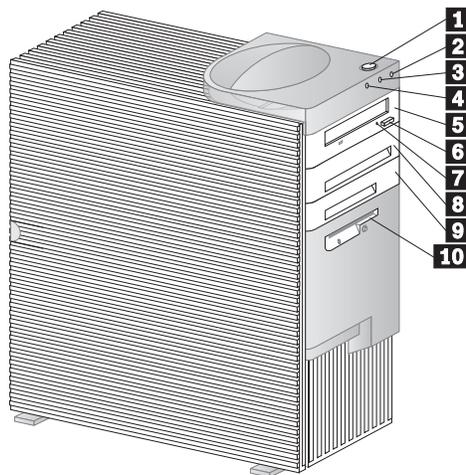
[1] The client LAN light is used with integrated Ethernet systems only.

Your computer comes with a diskette drive installed in bay 4 and a hard disk drive installed in bay 6. If your computer comes with a CD-ROM drive, it is installed in bay 1.

Input/Output Connectors

Input∕output (I/O) connectors provide ports for transferring information into and out of your computer. You can connect a variety of I/O devices to your computer, including a monitor, keyboard, mouse, and printer. For more information on the ports and their specific technologies, see *Understanding Your Personal Computer*.

At the rear of your computer is a panel that provides access to the I/O connectors. Adapters installed in expansion slots might also provide I/O connectors.
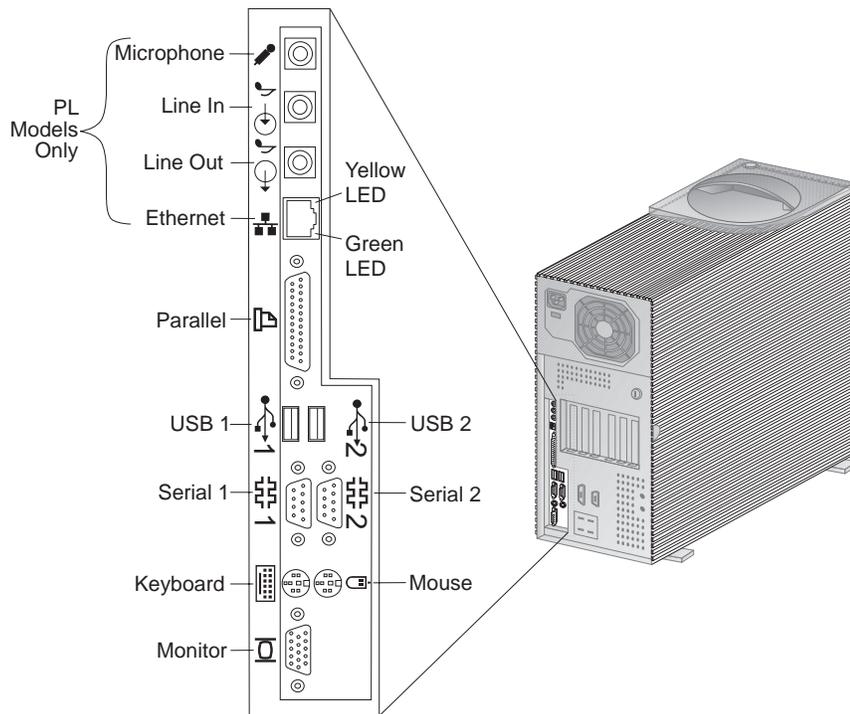
Note: Your computer might not have all the connectors shown.

Chapter 3. Working with Options on the System Board

This chapter provides information about system board options discussed in this book.

This chapter also provides instructions for installing, removing, and replacing system board components, specifically system memory, video memory, and the microprocessor. For information on other system board components, see the appropriate section.

Important

- Run ConfigSafe (or a similar application) to take a *snapshot* of your computer configuration before installing an optional device. This allows you to view and compare the changes in the computer configuration after you install an option. Also, if you have problems configuring the option after it is installed, ConfigSafe allows you to restore the configuration to the previous settings.

  ConfigSafe is a part of the preinstalled software in your computer. For more information, see *About Your Software* that comes with your computer.

- Be careful when working near the microprocessor. Under normal use, the microprocessor can become very hot.

Accessing the System Board

To access the system board, you must remove the computer cover. For information on removing the computer cover, see "Disconnecting Cables and Removing the Cover" on page 5.

When working with options on the system board, it helps to place the computer on its side on a table. Most of the illustrations in this section show the computer on its side.

Also, you might need to remove adapters to access some components of the system board. For more information, see Chapter 4, "Working with Adapters" on page 22.

Identifying Parts on the System Board

The system board, also called the *planar* or *motherboard*, is the main circuit board in your computer. It provides basic computer functions and supports a variety of devices that are IBM-installed or that you can install later.

If you plan to install, remove, or replace hardware in your computer, you need to know the layout of the system board. The following illustration shows the layout of the system board in your computer. The numbered pointers show the components that are discussed in this book.

1	Battery
2	Microprocessor-speed switches
3	Microprocessor
4	DIMM 0
5	DIMM 1
6	DIMM 2 (not on all models)
7	Clear CMOS Request jumper
8	AGP connector (some models only)
9	Video memory connector (some models only)
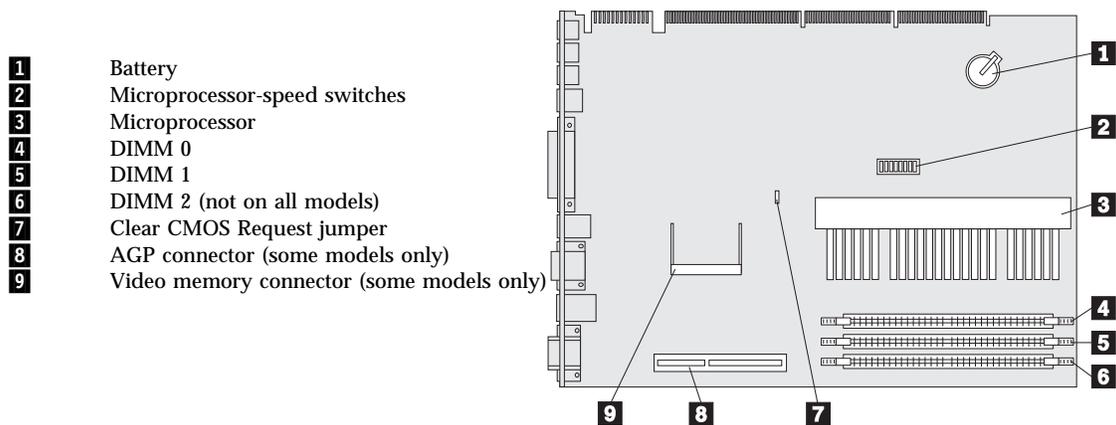
Note: An illustration of the system board and additional information are provided on a label found inside the computer.

Working with System Memory

You can add memory to your computer to increase system performance. Your computer has either two or three connectors (DIMM 0, DIMM 1, and DIMM 2) for installing system memory modules. If your computer has three connectors, the maximum amount of system memory your computer supports is 384 MB. If your computer has two connectors, the maximum amount of system memory your computer supports is 256 MB.

To locate the memory connectors inside your computer, see "Identifying Parts on the System Board." DIMM 2 is not on all models.

```
DIMM 0 — ⊞⊞ ⸋⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⸋ ⊞⊞⊞
DIMM 1 — ⊞⊞ ⸋⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⸋ ⊞⊞⊞
DIMM 2 — ⊞⊞ ⸋⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⊞⸋ ⊞⊞⊞
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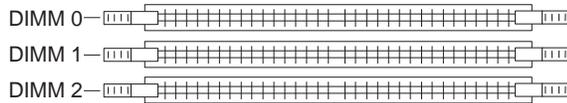
The memory modules your computer uses are *dual inline memory modules (DIMMs)*.

If your computer has an Intel Pentium II or Pentium III processor, the IBM-installed DIMMs that come with your computer are non-parity or Error Checking and Correction (ECC) 100 MHz Synchronous Dynamic Random Access Memory (SDRAM) modules.

If your computer has an Intel Celeron processor, the IBM-installed DIMMs that come with your computer are non-parity or ECC 66 MHz SDRAM modules. However, not all models with an Intel Celeron processor support ECC memory.

When installing or replacing DIMMs, follow these guidelines:

- Use only 3.3 V dc, unbuffered, 100 MHz DIMMs on models with Intel Pentium II processors.

- Use only 3.3 V dc, unbuffered, 66 MHz DIMMs on models with Intel Celeron processors.

- Each memory connector supports a maximum of 128 MB of memory.

- Install only ECC DIMMs to enable ECC. If you mix ECC DIMMs and non-parity DIMMs, your memory will function as non-parity DIMMs.

Memory Configuration

When you are adding or removing memory, you can use any combination of DIMM sizes 16, 32, 64, or 128 MB. Be sure to fill each system memory connector sequentially, starting at *DIMM 0*. For the location of DIMM 0, see "Identifying Parts on the System Board" on page 11.

The following table shows possible memory configurations for your computer; this table and additional information are also found on a label inside the computer.

Note: Values in the following table are represented in megabytes (MB).

Total Memory (MB)	DIMM 0	DIMM 1	DIMM 2
16[2]	16	0	0
32[2]	16	16	0
32[2]	32	0	0
48	16	16	16
48[2]	32	16	0
64	32	16	16
64[2]	32	32	0
64[2]	64	0	0
96[2]	32	32	32
96	64	32	0
128[2]	64	32	32
128[2]	64	64	0
128	128	0	0
256	128	64	64
256[2]	128	128	0
384	128	128	128

Installing a Memory Module

Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Read the instructions that come with the optional device.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer.

  Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer cover.

- Remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5), and lay the computer on its side.


Note: For information on memory configuration, see the table on page 12.

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[2] Valid values for models with only two DIMM connections.

1 To locate the memory connectors inside your computer, see "Identifying Parts on the System Board" on page 11.

2 Be sure the retaining clips are in the open position, as shown in the second illustration below. If the retaining clips are perpendicular with the connector, push outward on them until they click open.
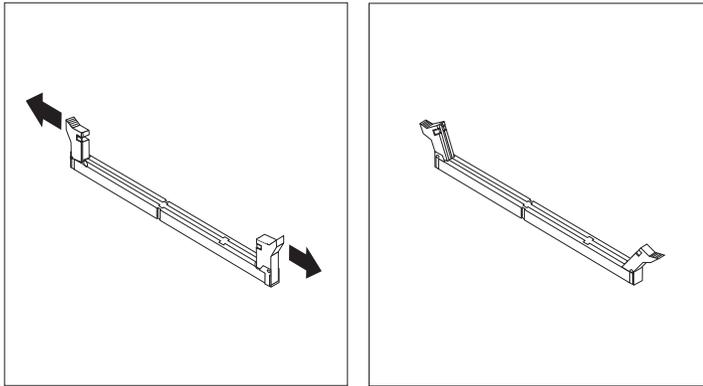
3 Touch the static-protective package containing the memory module to any *unpainted* metal surface in the computer, and then remove the module.

4 Position the module above the connector so that the two notches on the bottom edge of the module align properly with the connector.
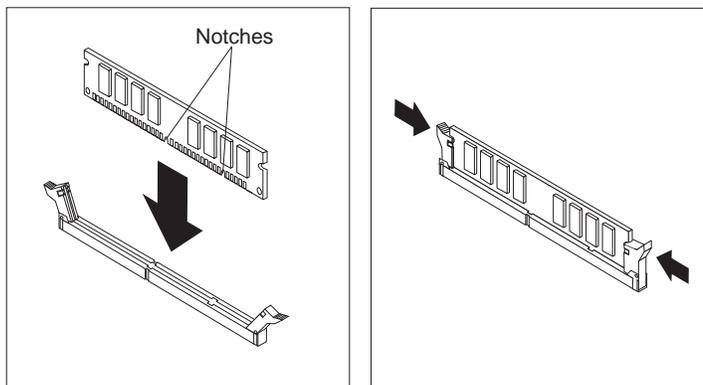
5 Firmly push the module straight down into the connector until the retaining clips pop up and snugly fit around both ends of the module.

6 To install another memory module, repeat steps 1–5.

7 Go to the device-record form in *Using Your Personal Computer* and record this installation.

What to do next

- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 7, "Completing the Installation" on page 66.

Removing a Memory Module

Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Read the instructions that come with the optional device.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer.

  Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer cover.

- Remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5), and lay the computer on its side.

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1 To locate the memory connectors inside your computer, see "Identifying Parts on the System Board" on page 11.

2 At both ends of the memory module connector, push outward on the retaining clips until the module is loosened. Lift the memory module out of the connector.

  Note: Be careful not to push too hard on the retaining clips because the module may abruptly eject from the connector.
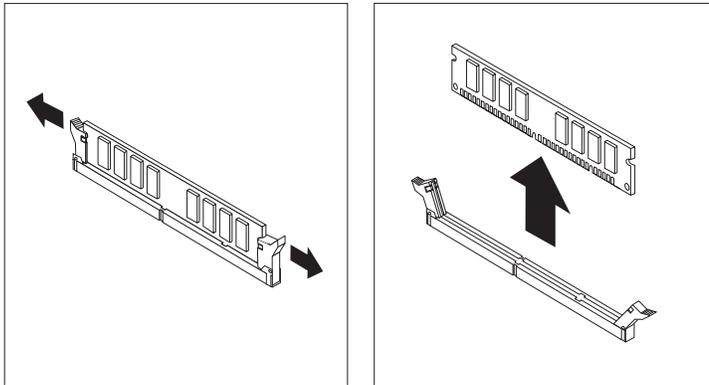
3 Store the module in a static-protective package.

What to do next

- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 7, "Completing the Installation" on page 66.

Installing a Video Memory Module

The video memory module is a small outline DIMM (SODIMM).

Because not all PC 300PL and PC 300GL models have a connector for installing a video memory module upgrade, the following instructions are for some computers only.

If your computer comes with 4 MB of video memory, installing a video memory module on the system board is not an option. To view the amount of video memory of your computer, see the "System Summary" menu in the Configuration/Setup Utility program (see *Using Your Personal Computer*).

1 Touch the static-protective package containing the video memory module to any *unpainted* metal surface in the computer, and then remove the module.

2 Seat the video memory module at an angle in the connector.

3 Move the video memory module toward the system board until it is secured by the two clips.
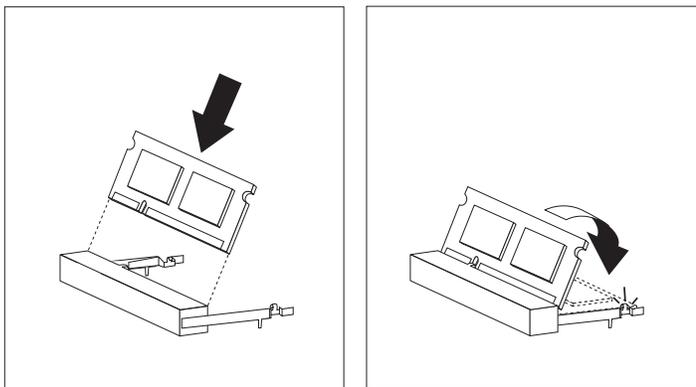
Replacing a Microprocessor

Your computer comes with either an Intel® Pentium®II microprocessor, a Pentium Intel III microprocessor, or an Intel Celeron® microprocessor installed on the system board.

For the latest information on microprocessor upgrades available for your computer, contact your IBM reseller or IBM marketing representative. If you do upgrade the microprocessor, use the instructions that come with the upgrade along with the instructions in this publication.

Note: Upgrading a microprocessor may require a BIOS update. After replacing or upgrading your processor, you may get a '167' POST error code. If you get this error, you must update the BIOS.

CAUTION:
The microprocessor and heat sink will be hot if the computer has been running. To avoid the possibility of a burn, if the computer has been on, let the microprocessor and heat sink cool for 10 minutes before continuing with the procedure.


Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Read the instructions that come with the optional device.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer.

   Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer cover.

- Remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5), and lay the computer on its side.

Note: The heat sink in your computer might look different from the one shown.

1 See "Identifying Parts on the System Board" on page 11 to locate the microprocessor socket.

2 Place your index fingers on the small tabs on the top of the microprocessor. Push in toward the microprocessor until the tabs release.

Tabs
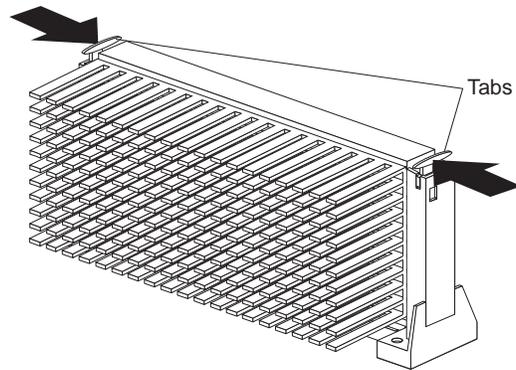
3 Carefully place one hand on the computer frame and with the other hand pull the microprocessor up and out of the connector.
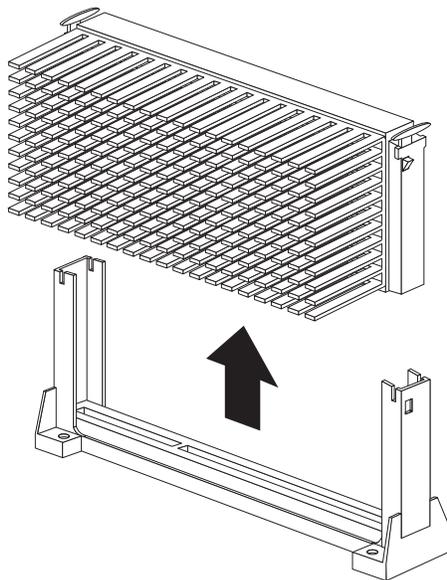

4 Store the old microprocessor in a static-protective package.

5 Touch the static-protective package containing the new microprocessor to any *unpainted* metal surface in the computer, and then remove the new microprocessor.

6 Press in on the retainer tabs until they click into place.

7 Align the new microprocessor with the connector on the system board and slide it into the guides. Press the microprocessor down until it seats in the connector.
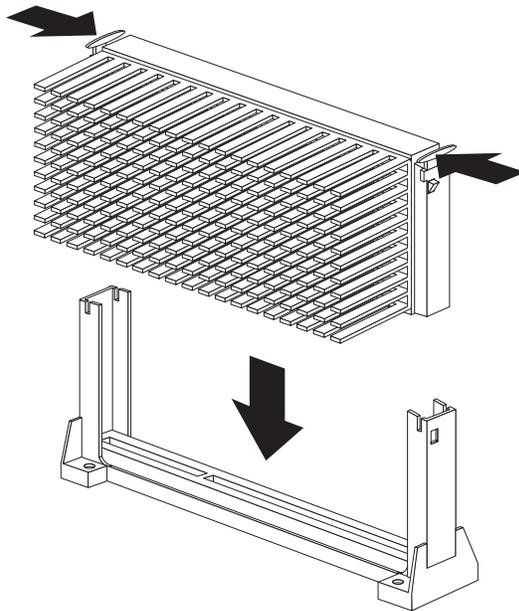
8 Pull outward on the retainer tabs.
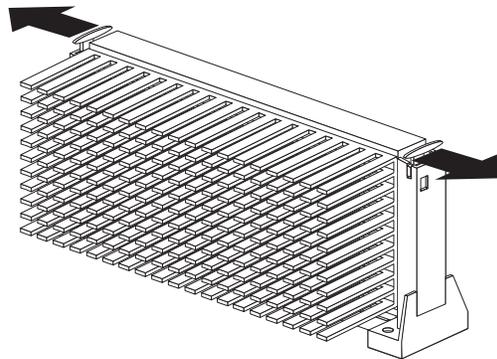
Note: If you replaced the microprocessor with one that has a different speed, you must update the microprocessor speed. To do this, you must access the switches on the system board and set them accordingly. For information on locating the switches, see "Identifying Parts on the

System Board" on page 11. For information on the appropriate switch
settings, see the label on the underside of the computer cover, or
contact your place of purchase or IBM reseller.

What to do next

- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 7, "Completing the Installation"
  on page 66.

Chapter 4. Working with Adapters

This chapter provides information and instructions for installing and removing adapters, including instructions for working with adapters on the riser card and for installing an accelerated graphics port (AGP) adapter.

When you are installing or removing adapters, it is important to resolve any resource conflicts that might arise. For example, if you install an ISA legacy adapter, you might need to manually configure the adapter by setting a variety of switches on the adapter and by using the Configuration/Setup Utility program.

Many adapters now use *Plug and Play* technology, which enables the computer to automatically configure the adapter, provided that the required resources are available. Refer to the instructions that come with your adapter to determine if it is Plug and Play. For more information, see "Adapter Configuration" on page 24.

Important

- Run ConfigSafe (or a similar application) to take a *snapshot* of your computer configuration before installing an optional device. This allows you to view and compare the changes in the computer configuration after you install an adapter. Also, if you have problems configuring the adapter after it is installed, ConfigSafe allows you to restore the configuration to the previous settings.

  ConfigSafe is a part of the preinstalled software in your computer. For more information, see *About Your Software* that comes with your computer.

- Be careful when working near the microprocessor. Under normal use, the microprocessor can become very hot.

Riser Card

Your computer uses a riser card for expansion. The riser card contains expansion slots that connect adapters to the industry standard architecture (ISA) and peripheral component interconnect (PCI) buses.

You can install a variety of adapters in the expansion slots on the riser card. For information on locating the riser card, see "Locating Components" on page 7.

The riser card in your computer has three dedicated ISA slots and three dedicated PCI slots. The following illustration shows the expansion slots and connectors on the riser card.

ISA

ISA

ISA

PCI

PCI

PCI

CD
Audio

Fan

SCSI Hard Disk LED

Wake on LAN

Asset ID Antenna

Chassis-Intrusion Detector

Internal
Speaker

340-Pin
Connector

Alert on LAN
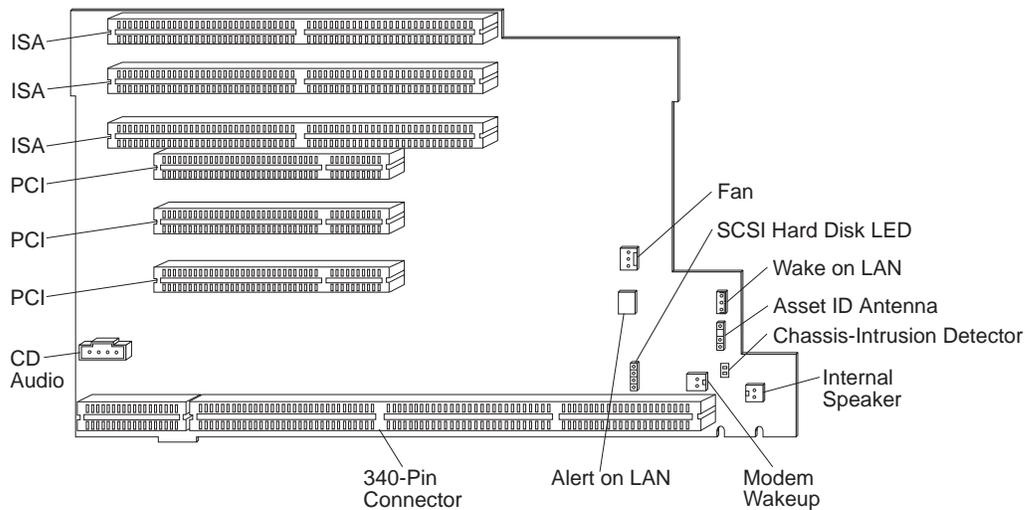
Modem
Wakeup

Notes:

1. Chassis-intrusion, Alert on LAN, and Asset ID are available on some models only.

2. If you attach a 4-position cable connector to the 2-pin Modem Wakeup connector, ensure that the unused positions are *next to the bottom of the riser card.* If this cable is incorrectly attached, the computer might automatically restart each time you turn power off.

The diskette and IDE drive connectors are on the back side of the riser card. When installing optional drives, refer to the following illustration for the location of the appropriate connectors.

Diskette Drive
Secondary IDE
LED Panel
Primary IDE   Power
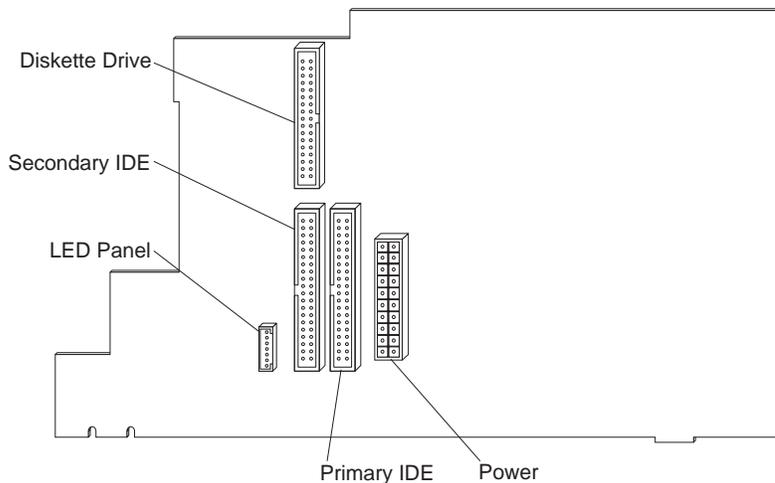
Adapter Configuration

Along with the documentation that comes with your adapter, use the following
information to help with adapter configuration.

Plug and Play Adapters

Your computer uses the *Plug and Play* method to configure adapters. Support for
Plug and Play is built into the system board of your computer.

If an adapter is Plug and Play, there are no switches or jumpers that must be set on
the adapter. A Plug and Play adapter comes with configuration specifications set in
memory to provide installation information to the computer during startup. When
you install or remove Plug and Play adapters, this information is interpreted by the
basic input/output system (BIOS), which supports Plug and Play technology. If the
required resources are available, the BIOS software automatically configures the
adapter around the resources already in use by other devices.

Most adapters designed for PCI slots are Plug and Play devices; many ISA adapters
are not Plug and Play devices.

Notes:

1. If a resource conflict arises after installing a Plug and Play adapter, you might need to change the default resource settings on the adapter. For more information, refer to the documentation that comes with the adapter.

2. For information on error messages from resource conflicts, see *Using Your Personal Computer.*

Legacy Adapters

Adapters that are not Plug and Play-compatible are known as *legacy* devices. If you install a legacy adapter, you must manually configure it by setting switches on the adapter and by allocating system resources using the Configuration/Setup Utility program.

In the Configuration/Setup Utility program, the ISA Legacy Resources screen shows the computer resources that are typically required by adapters:

- Memory resources
- I/O port resources
- DMA resources
- Interrupt resources

From the appropriate screens, you can select available resources for the adapter you are installing. Resources not being used by ISA legacy adapters are listed as [**Available**]. You must set the resources used by the newly installed ISA legacy adapter to [**ISA Resource**]; this reserves the resources for the legacy adapter and prevents the BIOS from using these resources for the system or other Plug and Play adapters.

Just as you change system resources when you install an ISA legacy adapter, you must also change resources when you remove an ISA legacy adapter. If you remove a legacy adapter, change the resources that were being used to [**Available**]. This allows the Plug and Play software to automatically use these resources for future configurations, or they can be used later when other legacy adapters are installed.

Note: Refer to the documentation that comes with the adapter for information on required system resources.

For information on configuring ISA legacy adapters, see "Configuring an ISA Legacy Adapter" on page 71 or refer to *Using Your Personal Computer.* For information on error messages from resource conflicts, see *Using Your Personal Computer.*

Installing Adapters in the Riser Card

Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Read the instructions that come with the new adapter. Determine if the adapter must be installed in an ISA or PCI slot.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer (see "Disconnecting Cables and Removing the Cover" on page 5).

  Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer.

- Remove the computer cover, and lay the computer on its side (see "Disconnecting Cables and Removing the Cover" on page 5).
- To install some adapters, you might need to remove the bottom cover, the system board, and the fan. For more information, see "Opening the Bottom Cover" on page 32, "Moving the System Board" on page 34, and "Moving the Fan" on page 36.

---

1 Remove the screw and bracket.
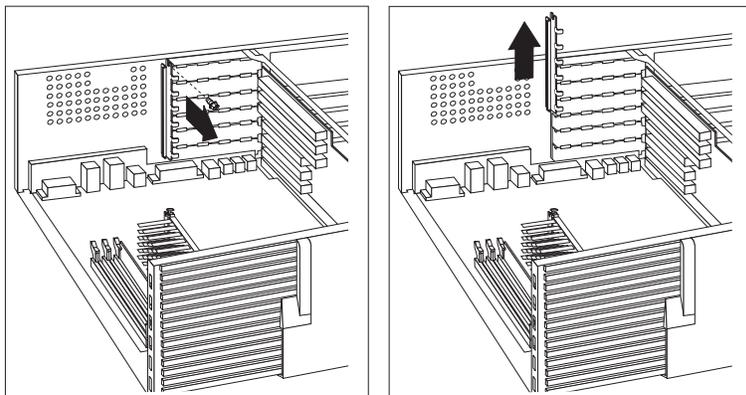
2 Remove the appropriate expansion-slot cover.

Next, touch the static-protective package containing the adapter to any *unpainted* metal surface in the computer; then, remove the adapter from the package. Install the adapter.

Note: The components of a PCI adapter face down toward the system board, and the components of an ISA adapter face up.
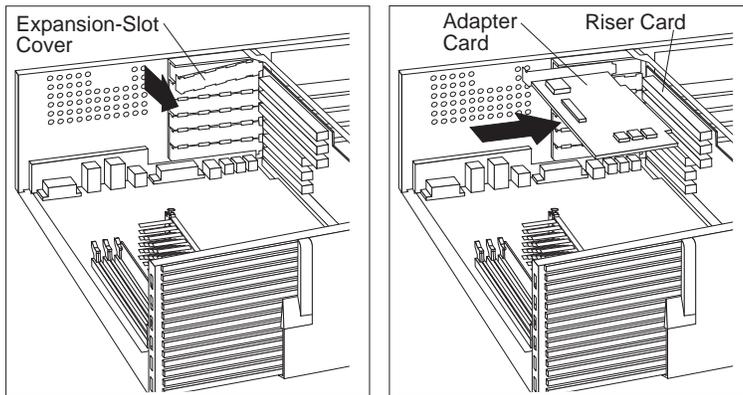
3 Install the bracket and the screw.
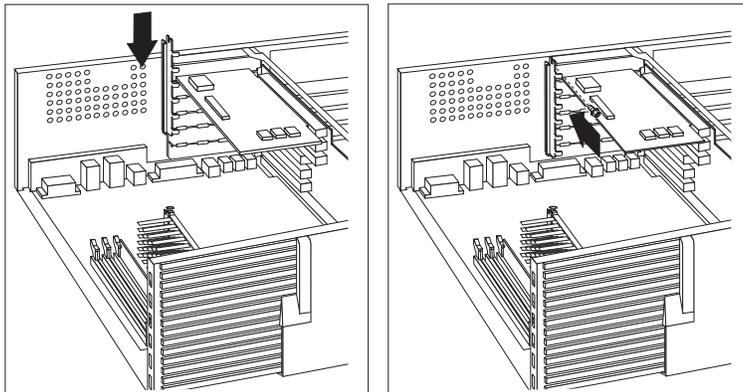
4 If you installed a network adapter that uses Wake on LAN or Alert on LAN, attach the cable from the riser card to the adapter. See page 22 to locate the Wake on LAN or Alert on LAN connectors. If you installed a modem and want to use Modem Wakeup, see page 22 to locate the Modem Wakeup connector on the riser card.

Removing Adapters from the Riser Card

┌─ **Before you begin** ────────────────────────────────────┐

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer (see "Disconnecting Cables and Removing the Cover" on page 5).

  Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer.

- Remove the computer cover, and lay the computer on its side (see "Disconnecting Cables and Removing the Cover" on page 5).
- To remove some adapters, you might need to remove the bottom cover, the system board, and the fan. For more information, see "Opening the Bottom Cover" on page 32, "Moving the System Board" on page 34, and "Moving the Fan" on page 36.

└──┘

1 Remove the screw and the bracket.
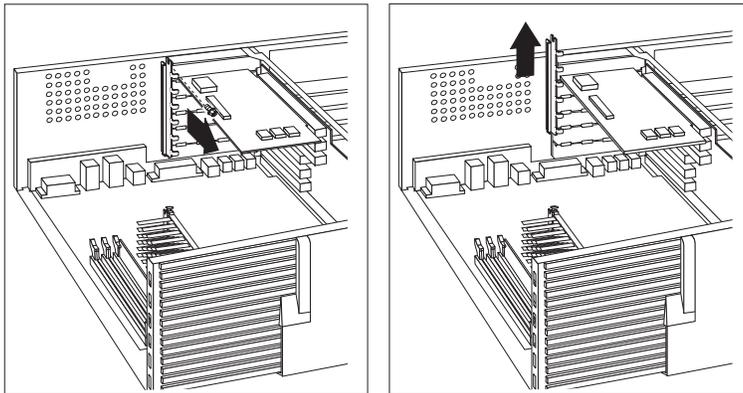
2 Disconnect any cables attached to the adapter, remove it, and insert it into a static-protective package. If you are not installing another adapter in this slot, install an expansion-slot cover.
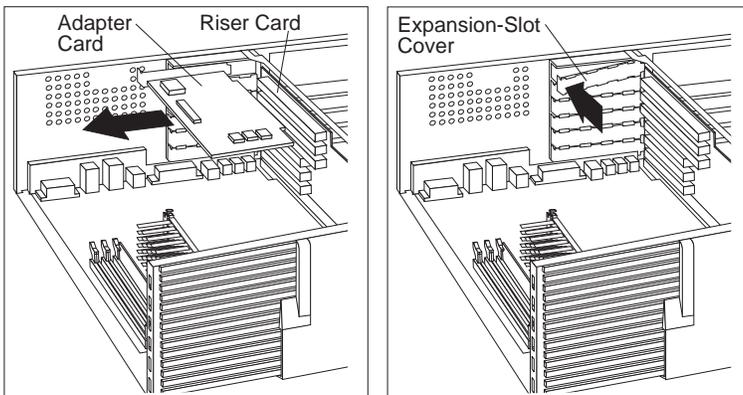
3 Install the bracket and the screw.
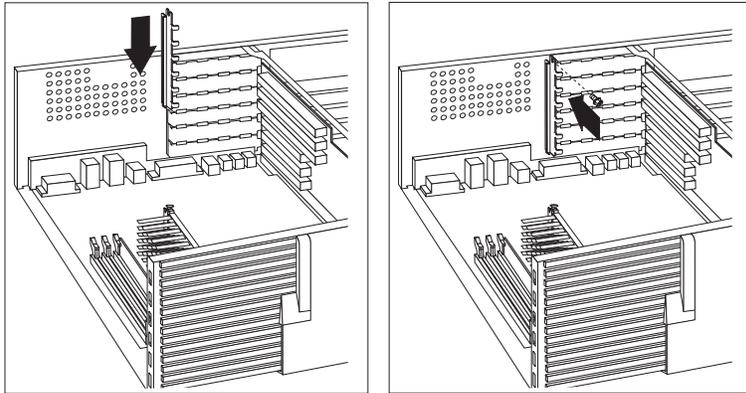
Note: Removing an adapter frees up system resources. If you remove an ISA legacy adapter, you must use the Configuration/Setup Utility program to set the previously used resources to [**Available**]. For more information, see Chapter 7, "Completing the Installation" on page 66.

What to do next

- Go to the device-record form in *Using Your Personal Computer*, and delete the name of the adapter you removed.
- If you removed the bottom cover, the fan, or the system board, replace them. See "Moving the Fan" on page 36, "Moving the System Board" on page 34, and "Opening the Bottom Cover" on page 32.
- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 7, "Completing the Installation" on page 66.


Installing an AGP Adapter

Not all PC 300PL and PC 300GL models have an AGP connector on the system board. Therefore, the following instructions are for some computers only.

1 Remove the screw and then remove the cover to access the two slots on the computer wall.
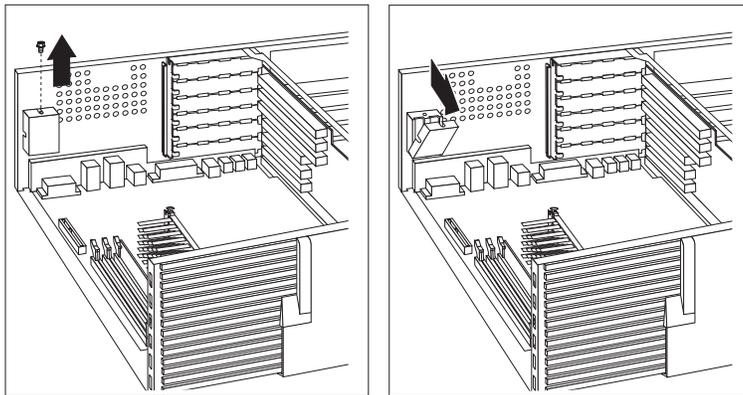
The slots on the computer wall provide access to the connector(s) on the AGP adapter for attaching external devices.

2 Install the AGP adapter. The following illustration shows the installation of an AGP adapter. Note that the connector for external devices on the AGP adapter is accessible through the slot on the computer wall.
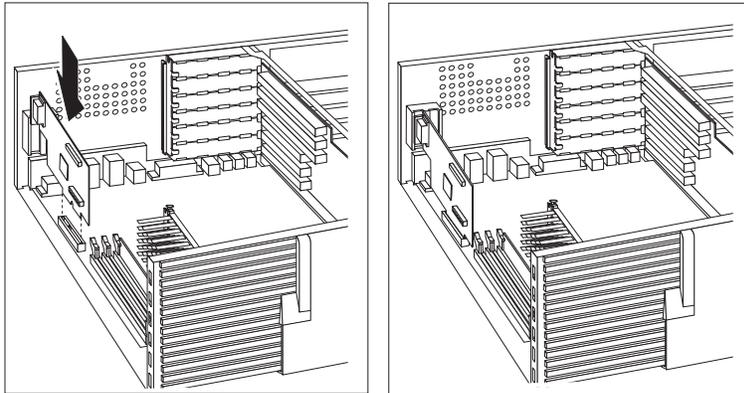
Note: Some adapters support the attachment of *daughter cards.* Because a daughter card might provide another connector for external devices, a second slot is provided on the computer wall for access.

What to do next

- Go to the device-record form in *Using Your Personal Computer*, and add the name of the AGP adapter you installed.
- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 7, "Completing the Installation" on page 66.

Opening the Bottom Cover

The following instructions are for removing and replacing the bottom cover.

Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Read the instructions that come with the optional device.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer.

  Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer cover.

- Remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5), and lay the computer on its side.


To remove the bottom cover:

1 Remove the screws from the bottom cover, and pivot the end of the bottom cover away from the computer frame.
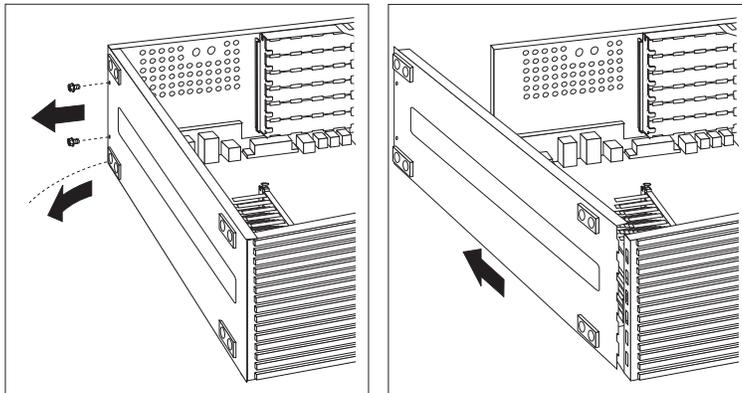
2 Slide the tabs on the end of the cover out of their openings and remove the cover.

To replace the bottom cover:

1 Hold the bottom cover at an angle and align the tabs on the end with the openings in the frame.

2 Fit the tabs into the openings and pivot the bottom cover until it is closed.
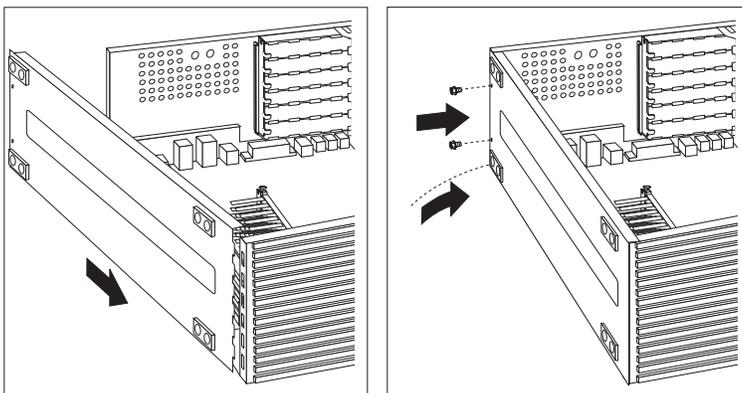
3 Align the holes and insert the two screws.

Moving the System Board

The following instructions are for removing and reinstalling the system board that comes with your computer.

Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Read the instructions that come with the optional device.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer.

  Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer cover.

- Remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5), and lay the computer on its side.
- Remove the bottom cover (see "Opening the Bottom Cover" on page 32).

To remove the system board:

1 On the left-hand rail, lift the system board latch handle upward to disengage the plastic tab on the bottom of the handle from the chassis.

2 Lift the end of the right-hand rail to disengage the plastic tab from the bottom of the chassis.

3 Grasp and turn the latch clockwise to the extended position. This releases the system board from the riser card.

4 Grasp the rails supporting the system board and carefully slide the system board out and set it aside.

CAUTION:
Do not pull on the microprocessor, memory modules, memory sockets, or other system board components to remove the system board.
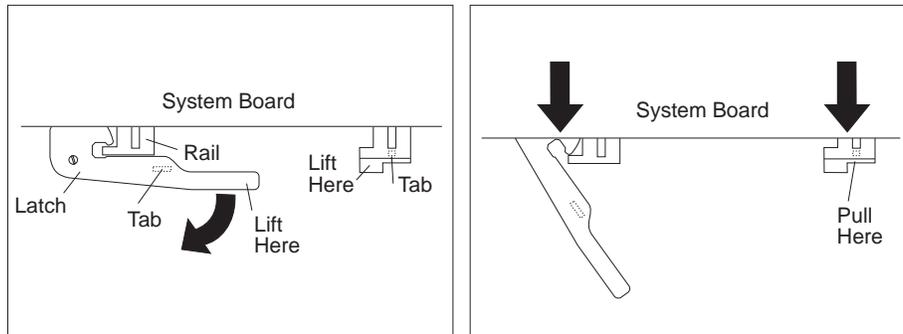
To reinstall the system board:

1 Make sure the system board latch handle is in the extended position.

2 Align the system board rails with the tracks on the chassis. Grasp the rails and slide the board in until it is approximately 6 mm. (0.25 in.) from the riser card edge connector.

3 Rotate the latch handle counter-clockwise until the system board is properly aligned with the riser card edge connector. Continue rotating the latch handle counter clockwise while firmly pushing on the end of the right-hand rail. When the system board is fully seated the tab on the right-hand rail is engaged in an opening in the chassis.

CAUTION:
Do not push on the microprocessor, memory modules, memory sockets, or other system-board components to install the system board.

4 Push down on the latch handle to engage the tab on the under side into the opening in the chassis. This holds the latch in the latched position.
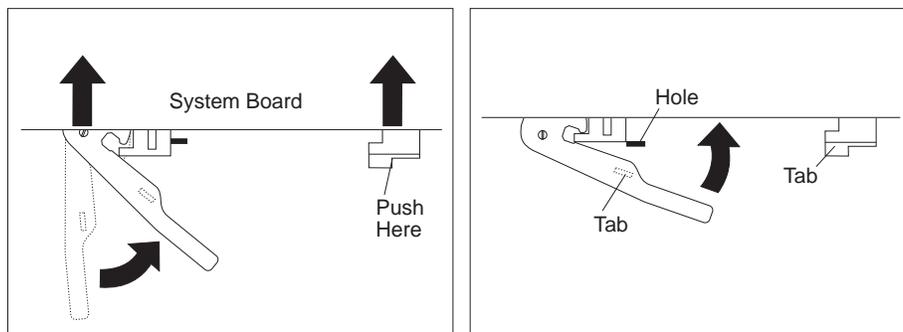
Note: You cannot see the connection with a full-sized adapter in place. To make sure the system board is fully seated, it is important that the tab on the right-hand rail is engaged in the opening in the chassis.

Moving the Fan

```
┌─ Before you begin ──────────────────────────────────────────────┐
│                                                                  │
│  • Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" │
│    on page 4.                                                     │
│  • Read the instructions that come with the optional device.     │
│  • Turn off the computer and all other connected devices.        │
│  • Disconnect all cables attached to the computer.               │
│                                                                  │
│    Attention: The presence of 5 V standby power might result in damage to │
│    your hardware unless you disconnect the power cord from the wall before │
│    opening the computer cover.                                   │
│                                                                  │
│  • Remove the computer cover (see "Disconnecting Cables and Removing the │
│    Cover" on page 5), and lay the computer on its side.          │
│                                                                  │
└──────────────────────────────────────────────────────────────────┘
```

Note: You might have to remove the bottom cover in order to move the fan. For instructions, see "Opening the Bottom Cover" on page 32.

1 Disconnect the fan cable from the riser card. See the label inside the computer for the location of the fan connector.

2 Press the tab and pull the fan forward until it clears the computer wall.

Tab
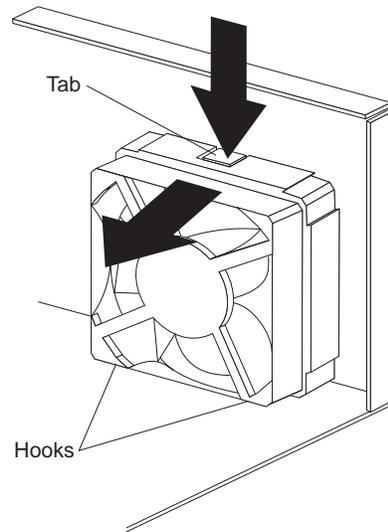
Hooks

3 Replace the fan by aligning the two hooks on the bottom of the fan assembly with the slots on the computer wall. Next, insert the tab on the fan assembly into the slot on the computer wall.

4 Connect the fan cable to the connector on the riser card.

Chapter 5. Working with Internal Drives

This chapter provides information and instructions for installing and removing internal drives.

When you are installing an internal drive, it is important to note which drive types and sizes you can install in each bay. Also, it is important to correctly connect the internal drive cables to the installed drive. For more information, see "Internal Drives."

Important

- Run ConfigSafe (or a similar application) to take a *snapshot* of your computer configuration before installing an optional device. This allows you to view and compare the changes in the computer configuration after you install an option. Also, if you have problems configuring the option after it is installed, ConfigSafe allows you to restore the configuration to the previous settings.

  ConfigSafe is a part of the preinstalled software in your computer. For more information, see *About Your Software* that comes with your computer.

- Be careful when working near the microprocessor. Under normal use, the microprocessor can become very hot.

Internal Drives

Internal drives are devices that your computer uses to read and store data. You can add drives to your computer to increase storage capacity and to enable your computer to read other types of media. Some types of drives available for your computer are:

- Hard disk drives
- CD-ROM drives

Internal drives are installed in *bays* at the front and rear of your computer. The bays are referred to as bay 1, bay 2, and so on.

Drive bays 1 through 4, at the front of your computer, are contained in one drive cage, and drive bays 5 and 6, at the back of your computer, are contained in another.

Your computer comes with the following IBM-installed drives:

- A 3.5-inch diskette drive in bay 4

- A 3.5-inch hard disk drive in bay **6**
- A CD-ROM drive in bay 1 (in some models)

The following illustration shows the location of the drive bays in your computer.

1	Bay 1
2	Bay 2
3	Bay 3
4	Bay 4
5	Bay 5
6	Bay 6
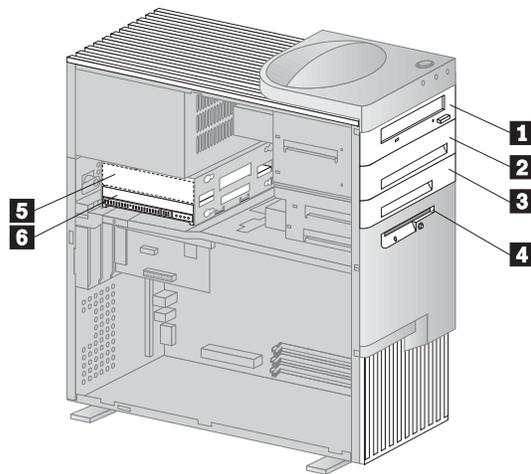
Drive Bay Specifications

The following table describes the drives you can install in each bay and their height requirements.

Bay	Drives Supported	Max. Height mm (in.)	Min. Height mm (in.)
Table 1. Drive Bay Specifications			
1	5.25-inch CD-ROM Tape backup drive 3.5-inch or 5.25-inch hard disk drive	41.3 (1.6)	25.4 (1.0)
2	5.25-inch CD-ROM Tape backup drive 3.5-inch or 5.25-inch hard disk drive	41.3 (1.6)	25.4 (1.0)
3	Hard disk drive	25.4 (1.0)	25.4 (1.0)
4	3.5-inch diskette drive	25.4 (1.0)	—
5	Hard disk drive	25.4 (1.0)	25.4 (1.0)
6	Hard disk drive	25.4 (1.0)	25.4 (1.0)

Notes:

- You cannot install drives that are greater than 41.3 mm (1.6 in.) high.
- You must install drives that require removable media (diskettes, tapes, or CDs) in the accessible bays: bay 1, 2, 3, or 4.
- You can install one diskette drive only.
- To properly mount a 3.5-inch drive into bay 1 or 2, you must use a 3.5-inch conversion kit for a 5.25-inch bay. For more information, contact your IBM reseller or IBM marketing representative.

Power and Signal Cables

Your computer uses cables to connect the power supply to the riser card and to integrated drive electronics (IDE) drives. The diskette drive is also powered through a cable attached to the riser card. The following cables are provided:

- Four-wire *power cables* connect most drives to the power supply. At the ends of these cables are plastic connectors that attach to different drives; these connectors vary in size. Also, some power cables attach to the riser card.

- Flat *signal cables*, sometimes called *ribbon cables*, connect IDE drives to the riser card. There are two sizes of signal cables that come with your computer:

  – The wider signal cable attaches to the installed hard disk drive and to the primary IDE connector on the back of the riser card.

    Note: The IDE signal cable provided with the PC 300PL has a second connector for attaching drives.

  – The narrower signal cable attaches to the diskette drive and to the diskette drive connector on the back of the riser card.

Each cable attaches to a connector on the riser card. To locate these connectors, see "Riser Card" on page 22. The following are some important points to remember when connecting power and signal cables to internal drives:

- The diskette drive and hard disk drive that are preinstalled in your computer come with power and signal cables attached. If your computer comes with a CD-ROM drive, it is attached to the secondary IDE connector on the back of the riser card. If you replace any drives, it is important to remember which cables are attached to which drives.

- When you install a drive, ensure that the drive connector at the end of the signal cable is always connected to the drive; also, ensure that the drive connector at the other end is connected to the riser card. This reduces electronic noise from the computer.

- If more than one IDE device is used on a single cable, one must be designated as the primary or master device and all others as slave or subordinate devices; otherwise, some of the IDE devices might not be recognized by the system. The master or slave designation is determined by switch or jumper settings on each IDE device.

- To optimize performance when installing more than two hard disk drives, be sure to attach hard disk drives with faster data transfer speeds (Mode 1 or higher) to the primary hard disk drive signal cable (hard disk drives 0 and 1).

- On some models, to install more than one IDE hard disk drive, you must purchase an additional signal cable. The cable must meet the following specifications:

  – Maximum length: 0.46 meters (18 inches)
  – Wire size: 28 AWG
  – Cable capacitive loading: 200 pF maximum

- You can install one diskette drive only.

Working with Drives in Bays 1, 2, 3, or 4

This section provides instructions for two different mechanical drive cage designs that contain bays 1 through 4. One drive cage is removable, and the other is not. Because the procedure for installing and removing drives is different for each design, both designs are explained below to help you identify which one you have.

- **Removable Drive Cage**

  Computers with the removable drive cage have a support bracket and screw that secure the front drive cage. If the drive support bracket is present, you must remove the drive cage before installing or removing drives (see "Removable Drive Cage Instructions"). The following illustration shows a computer with a removable drive cage.

Front Drive Cage

Drive Support Bracket
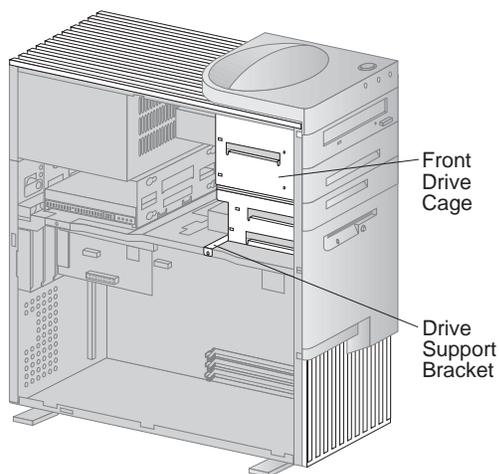
- **Non-Removable Drive Cage**

  If your computer does not have the drive support bracket (as shown in the preceding illustration), your computer has a non-removable drive cage.

  This drive cage is permanently fixed to the computer, and drives are installed or removed through the front of the computer. See "Non-Removable Drive Cage Instructions" on page 49.

Removable Drive Cage Instructions

The following instructions are for computers that have a removable drive cage for bays 1 through 4. To determine if your computer has this type of drive cage, see "Working with Drives in Bays 1, 2, 3, or 4."

The steps for installing or removing a drive in the removable drive cage are:

1. Remove the drive cage
2. Install or remove the drive
3. Replace the removable drive cage
4. Remove or replace a bay panel

Details of these steps are given over the following pages.


Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Read the instructions that come with the drive you want to install or replace.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer.

  Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer.

- Remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5).

Note: The following illustrations show the computer in an upright position. When installing or removing drives, you might find it easier to lay the computer on its side.

1 Remove the Drive Cage

    a Disconnect any cables connected to drives 1 through 4.
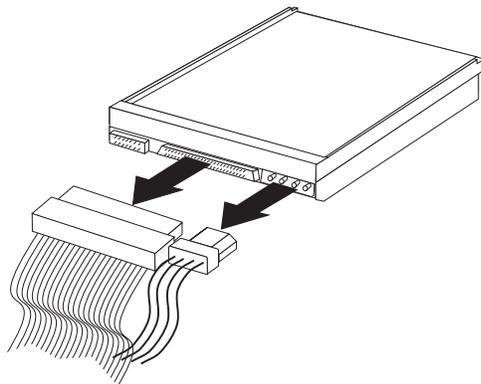
b Remove the top-handle cover and set it aside.
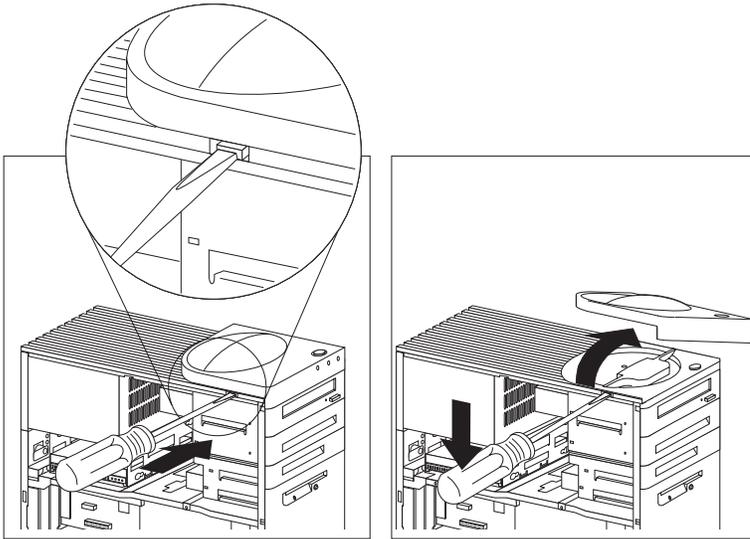
c Remove the top-handle screw and the screw from the drive support bracket. Next, move the drive cage towards the power supply until it stops, and then lift it away from the computer.
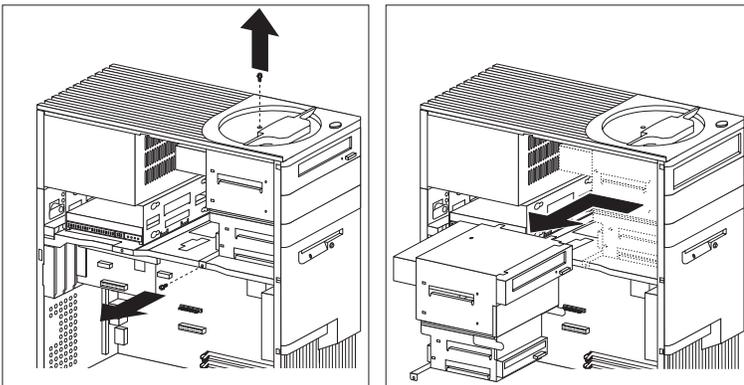
2 **Install or Remove the Drive**

To install a drive:

   a Remove the metal shield for the drive bay you want to use by pulling out the tabs on the sides of the shield until it flexes. Lift off one side, then the other.
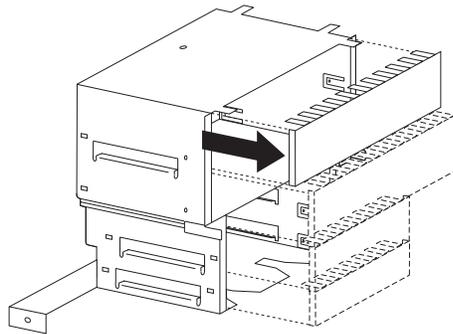

   b Touch the static-protective package containing the new drive to any *unpainted* metal surface and then remove the drive from it.

   c Install the drive into the drive bay. Insert and tighten the screws that hold the drive in place. The following illustration shows a CD-ROM drive being installed in bay 1.
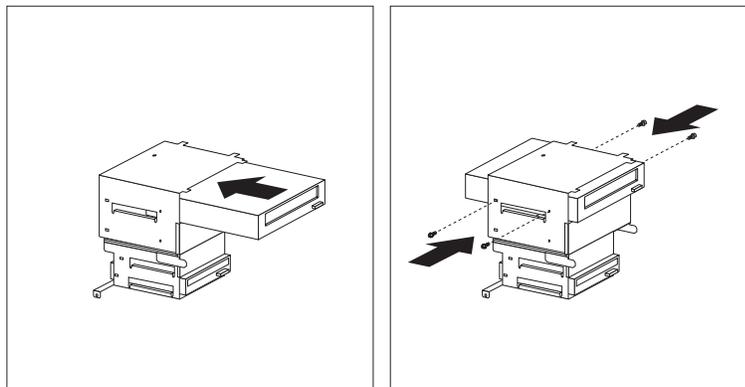
To remove a drive:

   a Remove the screws holding the drive in place; then slide the drive out of the bay.
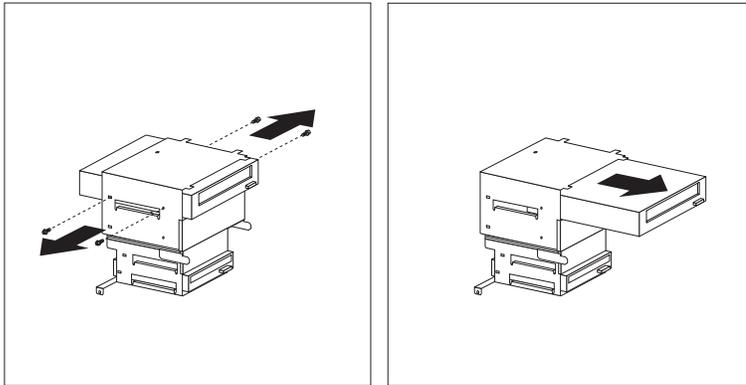
b Place the removed drive in a static-protective package.

c Insert the metal shield into the front drive cage.
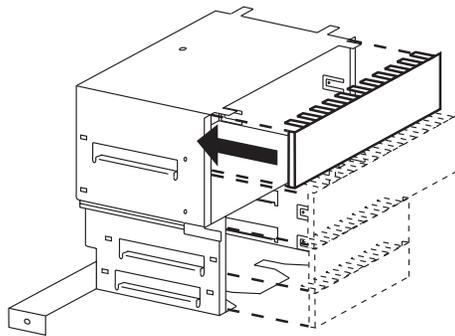

3 **Replace the Removable Drive Cage**

a Insert the drive cage and slide it to the right until it docks against the front of the computer; be sure the holes (for the screws) in the drive cage and support bracket are aligned.

b Insert and tighten the screw anchoring the drive cage at the side; then insert and tighten the screw on top.
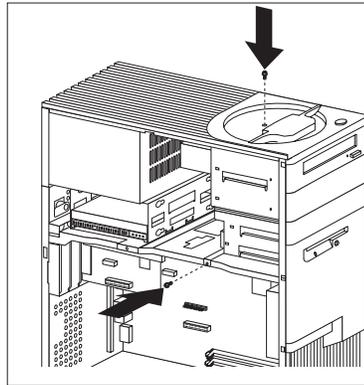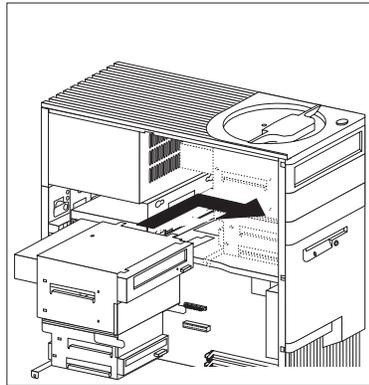
c Replace the top-handle cover.
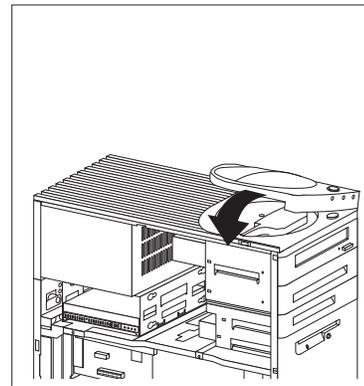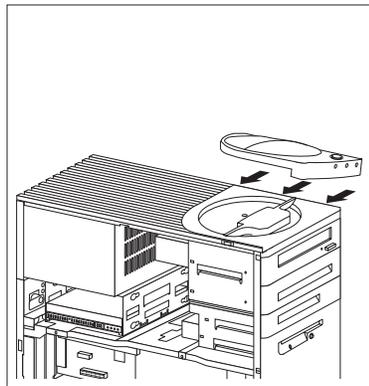
d Attach the cables to the drives. If necessary, refer to page 23 for an illustration showing the locations of the drive connectors on the riser card.
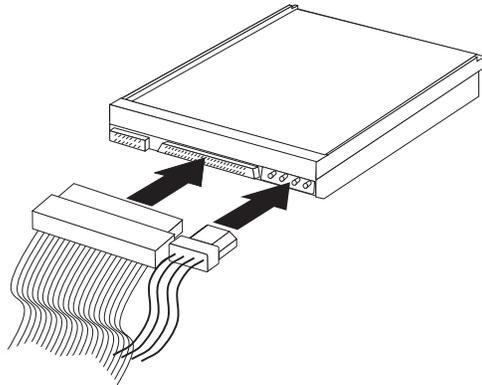
4 Remove or Replace a Bay Panel

To remove a bay panel:

If you have installed a drive with removable media, you must remove the bay panel. Use the tip of a screwdriver to release the bay panel.
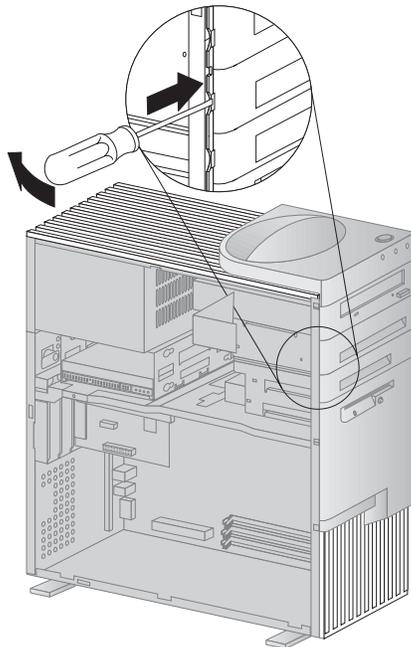
To replace a bay panel:

If you have installed a drive with non-removable media, or if the drive bay is empty, you must install a bay panel (if not already installed). Align the right-hand edge of the bay panel with the matching opening in the front of the computer, and gently press the left edge closed until it snaps.
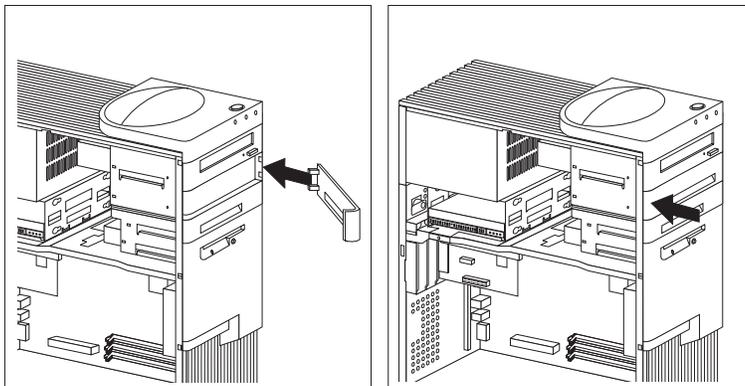
What to do next

- If you installed a CD-ROM drive and want to connect the drive to the CD-ROM audio connector, see page 22 to locate the CD-ROM audio connector on the riser card.
- Go to the device-record form in *Using Your Personal Computer* and record the installation or removal of the drive.
- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 7, "Completing the Installation" on page 66.

Non-Removable Drive Cage Instructions

The following instructions are for computers that have a non-removable drive cage for bays 1 through 4. To determine if your computer has this type of drive cage, see "Working with Drives in Bays 1, 2, 3, or 4" on page 42.

- "Installing a Drive" on page 50
- "Removing a Drive" on page 53

Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer.

  Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer.

- Remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5).

Note: The following illustrations show the computer in an upright position. When installing or removing drives, you might find it easier to lay the computer on its side.

Installing a Drive

1 Use the tip of a screwdriver to remove the bay panel for the appropriate drive bay. The following illustration shows a bay panel being removed from drive bay 2.
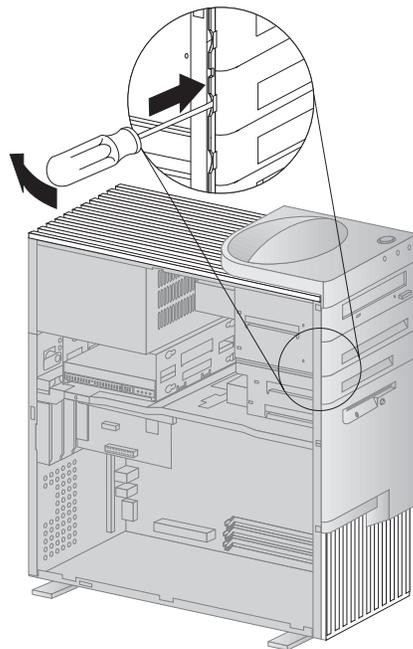
2 If knockouts are present in the drive bay opening, twist them with a screwdriver or pliers to remove.

The following illustration shows the type of knockouts in bay 1.
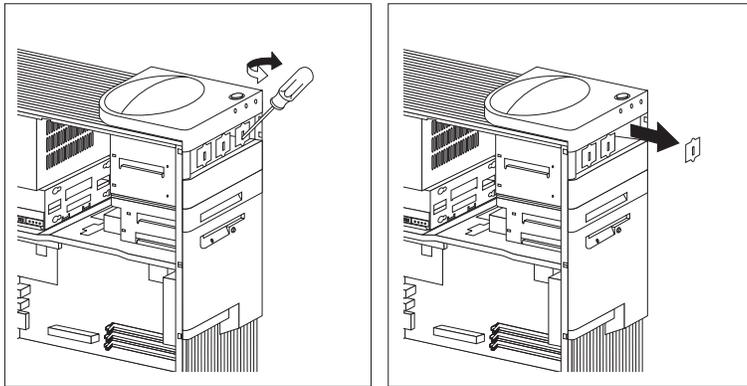
The following illustration shows the type of knockout in bays 2 and 3.
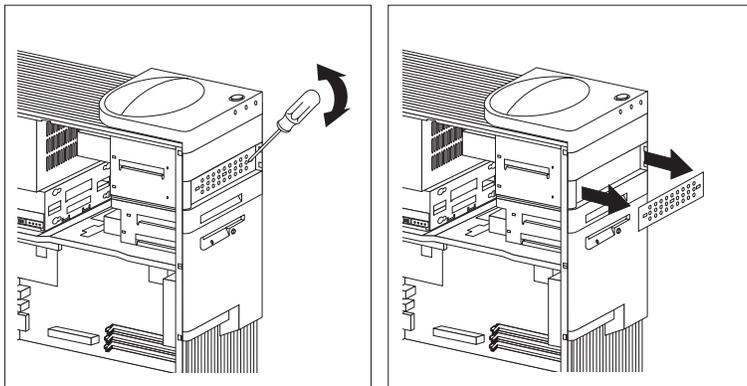
3 Install the drive in the bay opening and secure the drive by inserting screws.

> **Note:** As shown in the following illustration, only two screws are needed to secure the drive within the drive bay.
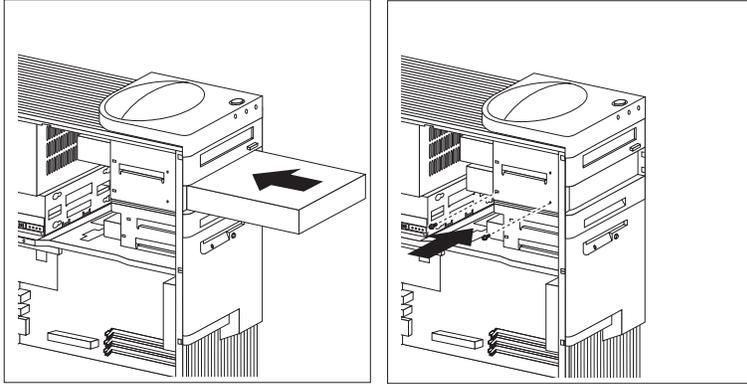
4 Attach the cables to the drives. If necessary, refer to page 23 for an illustration showing the locations of the drive connectors on the riser card.
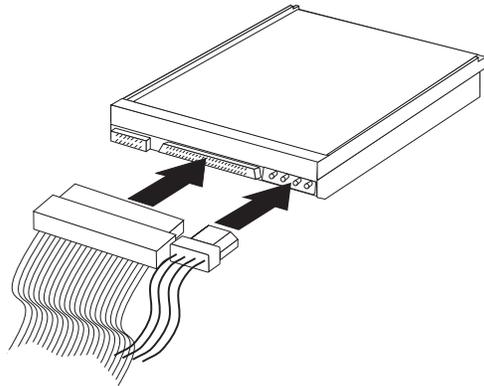
5 If the installed drive has non-removable media, replace the bay panel.
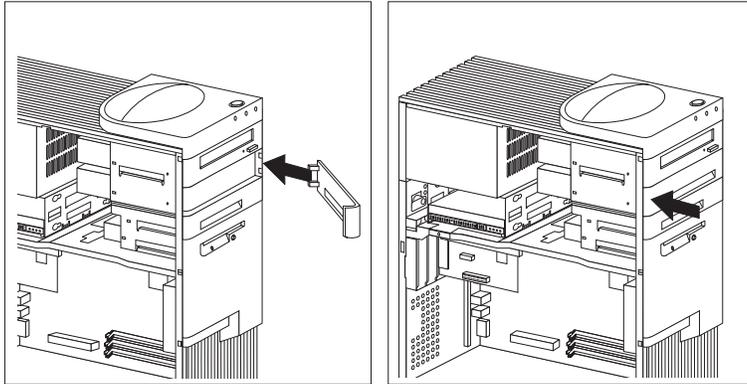

What to do next

- If you installed a CD-ROM drive and want to connect the drive to the CD-ROM audio connector, see page 22 to locate the CD-ROM audio connector on the riser card.
- Go to the device-record form in *Using Your Personal Computer* and record the installation of the drive.
- To remove a drive, see "Removing a Drive."
- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 7, "Completing the Installation" on page 66.


Removing a Drive

Note: The following instructions are for computers that have a non-removable drive cage.

**1** Disconnect all cables from the drive you want to remove.
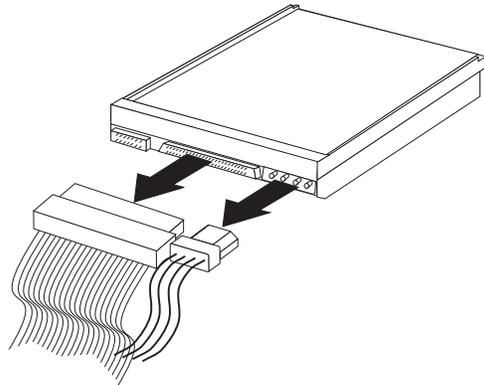
2 Use the tip of a screwdriver to remove the panel for the appropriate drive bay.
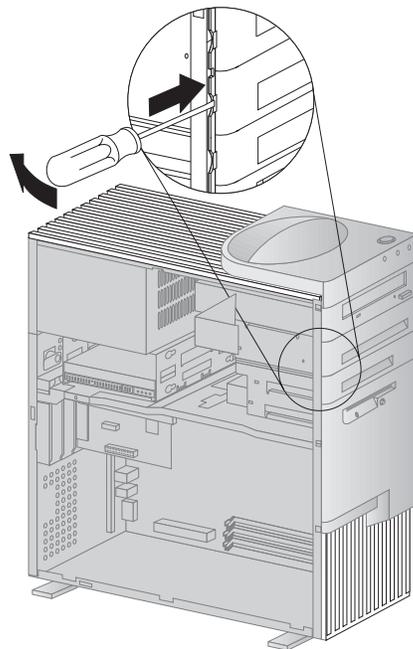
3 Remove the two screws holding the drive and slide it out the front of the computer.
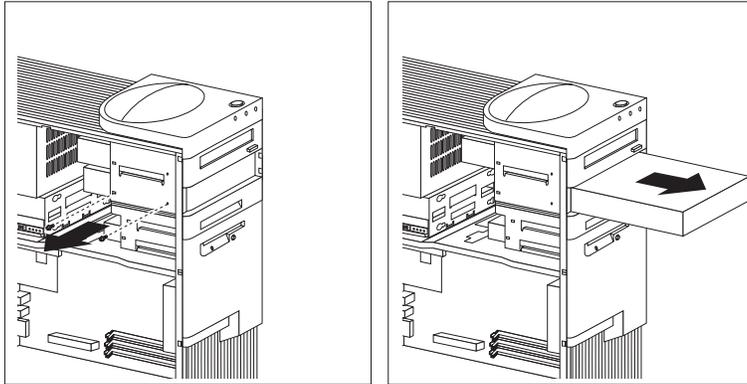
4 If you are not installing another drive, replace the bay panel.
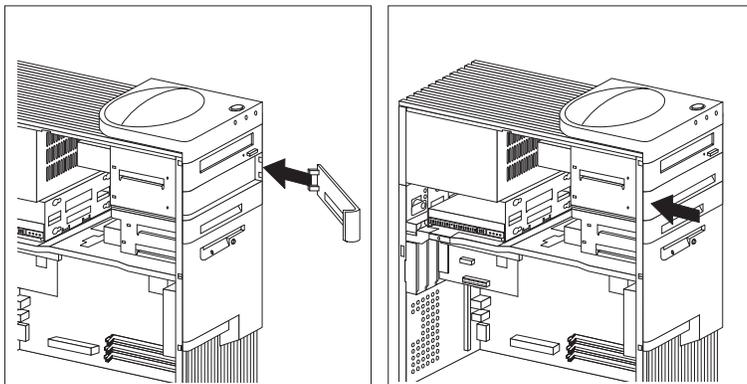
> **What to do next**
>
> - Go to the device-record form in *Using Your Personal Computer* and record the removal of the drive.
> - To install a drive, see "Installing a Drive" on page 50.
> - To work with another option, go to the appropriate section.
> - To complete the installation, go to Chapter 7, "Completing the Installation" on page 66.

Working with Drives in Bays 5 and 6

Any drives installed in bays 5 and 6 must be devices with non-removable media, such as hard disk drives. (Your computer comes with a hard disk drive in bay 6.)

To install or remove drives in these bays, you must remove the drive cage. This section contains instructions for installing and removing drives.


Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Read the instructions that come with the optional device.
- Turn off the computer and all other connected devices.
- Disconnect all cables attached to the computer.

  Attention: The presence of 5 V standby power might result in damage to your hardware unless you disconnect the power cord from the wall before opening the computer cover.

- Remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5).

Note: The following illustrations show the computer in an upright position. When installing or removing drives, you might find it easier to lay the computer on its side.

**1** Disconnect all cables attached to drives in bays 5 and 6.
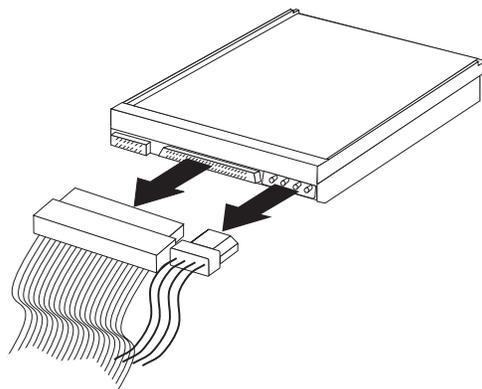
2 Remove the screw holding the drive cage and carefully slide the drive cage away from the computer.
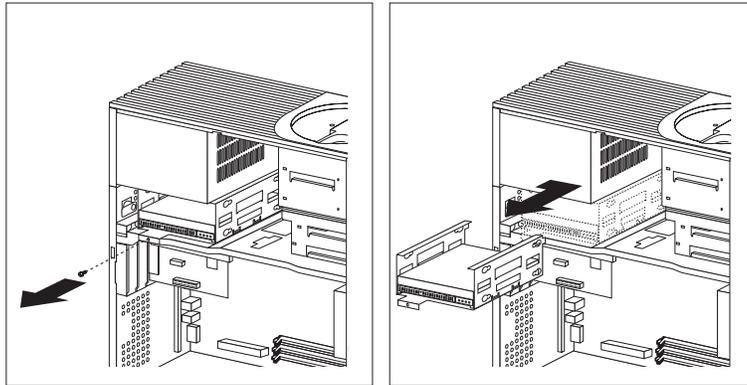
3 Do one of the following:

- To install a drive, slide the drive into the bay and secure it with the screws. There are two ways to install a drive into bay 5 or 6, using either top screws or side screws and grommets, which reduce noise caused by faster hard drives. To install a drive using top screws, slide the drive into the bay and tighten the screws in the top holes to secure the drive.
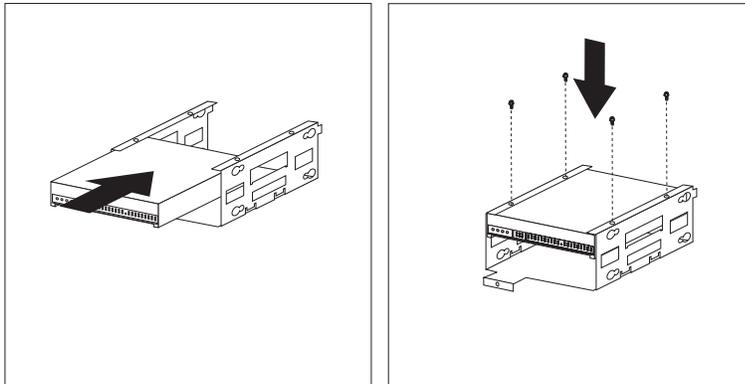

To install a drive that uses side screws and grommets for installation, insert the grommet into the large part of the hole (if not already installed), as demonstrated below, and slide it into the smaller part of the hole. Once the grommet is installed, slide the drive into the bay and tighten the screws in the hole.
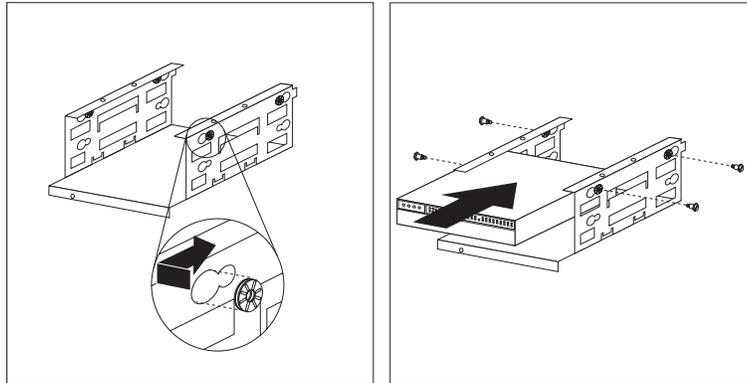
- To remove a drive, remove the screws holding the drive in the cage and slide the drive out of the cage.
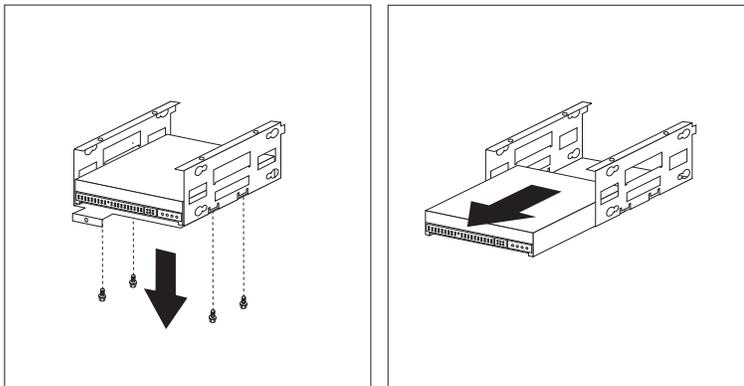
If your drive is installed with side screws and grommets, as shown in the second illustration, leave the grommets in the holes when removing the drive. The following illustration shows a drive removed this way.
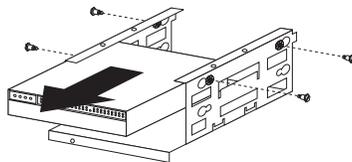
4 Reinstall the drive cage and secure it with the screw you removed in step 2 on page 56.

5 Connect the cables to the drive.
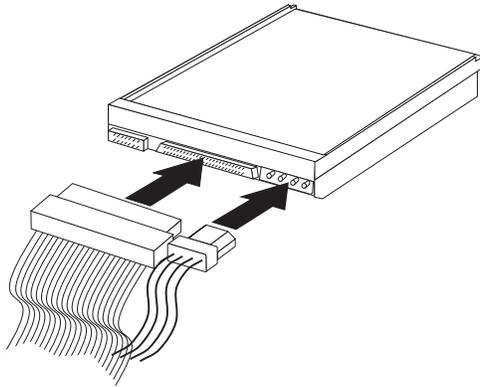
What to do next

- Go to the device-record form in *Using Your Personal Computer*, and record the installation or removal of the drive.
- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 7, "Completing the Installation" on page 66.

Chapter 6. Working with Security Options

This chapter describes some of the security options that are available for your computer.

To help prevent hardware theft, you can add a security U-bolt and cable to your computer. To erase lost or forgotten passwords, you can move the Clear CMOS Request jumper on the system board.

Note: Use the Configuration/Setup Utility program to set, change, or delete passwords. For more information, see *Using Your Personal Computer*.

The following list is a quick reference to these procedures:

- "Installing a U-Bolt"
- "Erasing Lost or Forgotten Passwords" on page 62

Installing a U-Bolt

Adding a U-bolt to the rear of your computer enables you to add a security cable and lock, which helps prevent hardware theft. After you add the security cable, make sure that it does not interfere with other cables that are connected to the computer.


Before you begin

- Obtain the following:
    - A 19-mm (3/4 in.) U-bolt and threaded nuts that fit the U-bolt
    - A security cable
    - A lock, such as a combination lock or padlock
    - An adjustable wrench
- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Turn off the computer and all connected devices.
- Disconnect all external cables and power cords, and remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5).

Note: The external connectors on the rear of your computer might differ from the ones shown in this section.

1 Locate the two holes on the lower right edge of the rear of the computer.

2 Insert the U-bolt through the rear panel; then, attach and tighten the nuts with an adjustable wrench.
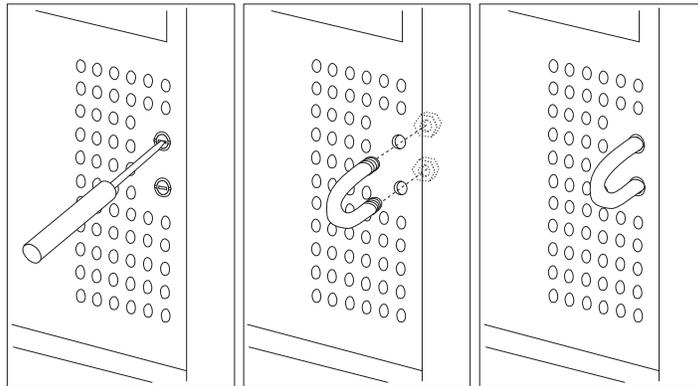
3 Replace the computer cover. For more information, see "Replacing the Cover and Connecting the Cables" on page 66.

4 Thread the cable through the U-bolt and around an object that is not a part of or permanently secured to the building structure or foundation, and from which it cannot be removed, then fasten the cable ends together with a lock.

The following illustration shows an example of how this might work.

Cable

Padlock
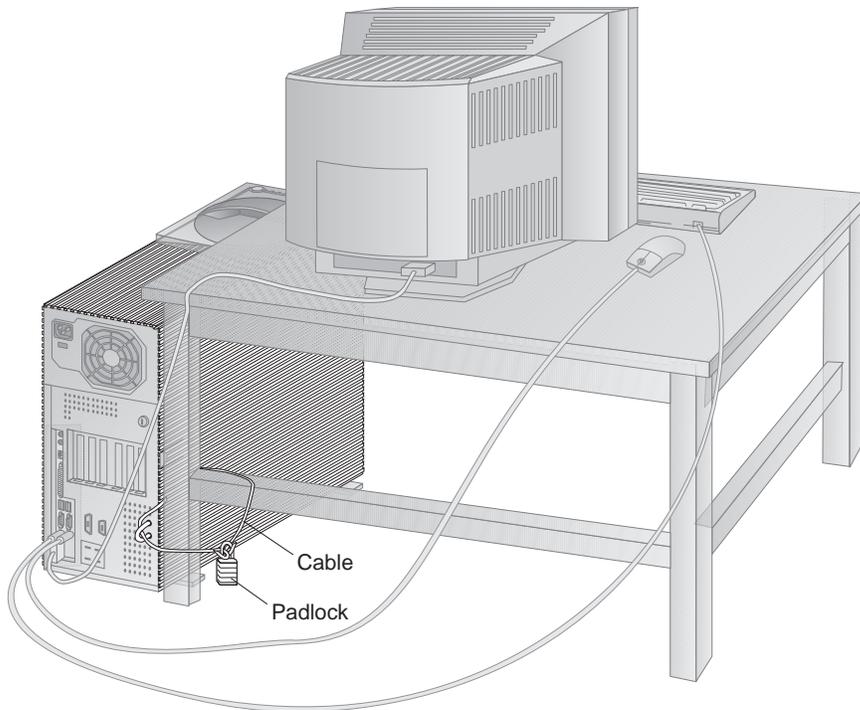
Erasing Lost or Forgotten Passwords

Note: To set a new password after completing this procedure, see *Using Your Personal Computer.*

Your computer uses *complementary metal-oxide semiconductor (CMOS)* memory on the system board for storing configuration and setup information. CMOS memory maintains information about:

- Date and time
- Security features
- Power-management devices
- Storage devices
- Keyboard and mouse
- ISA legacy configuration information
- Plug and Play configuration information
- Port assignments
- I/O addresses and interrupts
- Other selectable features

Within the security features are the settings for the power-on and administrator passwords. If you need to *erase* a lost or forgotten password, you must move a jumper to clear CMOS memory.

Enhanced Security Information for PC 300PL Models

Some models have a new, Enhanced Security feature that provides extra protection for your administrator password, as well as your startup sequence settings. With Enhanced Security enabled, your administrator password and startup sequence area stored in a highly-protected, nonvolatile, security EEPROM module that is separate from CMOS memory and the EEPROM module that stores system programs. When your administrator password and startup sequence are locked in the security EEPROM, they remain intact even if the battery in your computer expires or is removed by someone.

Be careful to keep a copy of your administrator password locked in a secure place, because if you have this Enhanced Security feature and forget your administrator password, your system will be unusable.

For more information on Enhanced Security, see *Using Your Personal Computer*.

Before you begin

- Using the Configuration/Setup Utility program, record all configuration information. Clearing CMOS memory sets the configuration of your computer to the default settings. Because you need to reconfigure the computer after clearing CMOS memory, record the configuration information of your computer *before* moving the Clear CMOS Request jumper.
- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Turn off the computer and disconnect all cables except the power cord.
- Remove the computer cover.
- Lay the computer on its side.
- Locate the Clear CMOS Request jumper. See "Identifying Parts on the System Board" on page 11.

  Note: You might have to remove adapters to gain access to the jumper. See "Removing Adapters from the Riser Card" on page 28.

---

1 Move the jumper from its normal position (pins 1 and 2) to pins 2 and 3. It might be helpful to use needle-nose pliers to move the jumper, but be careful not to scrape any system board components or crush the jumper.
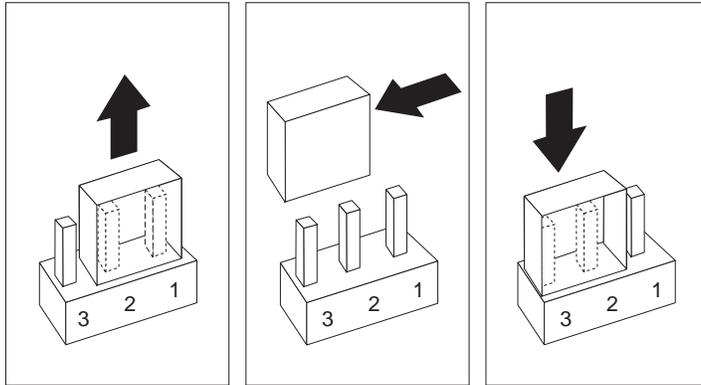
CAUTION:
Do not touch any of the internal components of the computer.

2 Reconnect the cables and turn on the computer. CMOS memory is now cleared and the passwords have been erased. After the POST completes, configuration error messages are displayed.

3 Follow the instructions on the screen to continue.

4 When the Configuration/Setup Utility program starts, make the necessary changes, save the settings, and exit setup. Refer to "Updating the Computer Configuration" on page 68. When the message is displayed that instructs you to move the jumper to the normal position, turn power off.

5 Disconnect the power cord from the rear of the chassis.

6 Move the jumper back to its normal position (pins 1 and 2).
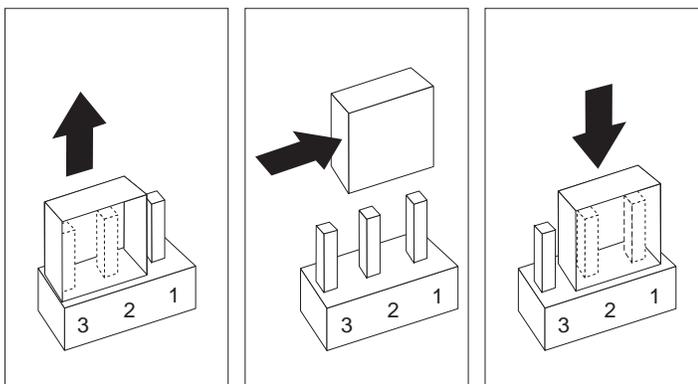
What to do next

After reassembling the computer (go to Chapter 7, "Completing the Installation" on page 66), use the Configuration/Setup Utility program to set any passwords or other configuration parameters. For more information, refer to *Using Your Personal Computer.*

Chapter 7. Completing the Installation

After working with options, you need to install any removed parts, replace the cover, reconnect any cables, including power cords and telephone lines. In addition, depending on the option installed, you might need to update information in the Configuration/Setup Utility program.

The following list is a quick reference to the completion procedures:

- "Using the Stabilizing Feet"
- "Replacing the Cover and Connecting the Cables"
- "Updating the Computer Configuration" on page 68

Using the Stabilizing Feet

The four feet attached to the bottom cover rotate 90 degrees to provide additional stability for your computer.

When you are finished installing the option(s), turn the four stabilizing feet a quarter turn out from the computer and set it carefully back on its feet.
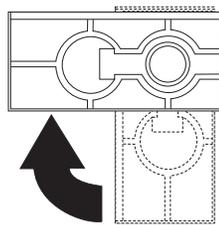
## Replacing the Cover and Connecting the Cables

> **Before you begin**
>
> - Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
> - If you set the computer in an upright position, ensure that the stabilizer feet are positioned correctly. See "Using the Stabilizing Feet."

1 Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer.

2 Clear any cables that might impede the replacement of the cover.

3 Make sure the cover lock (if present) is in the unlocked position.

4 Place the cover on the computer frame. Secure the cover by sliding it until the cover aligns with the rear of the computer.
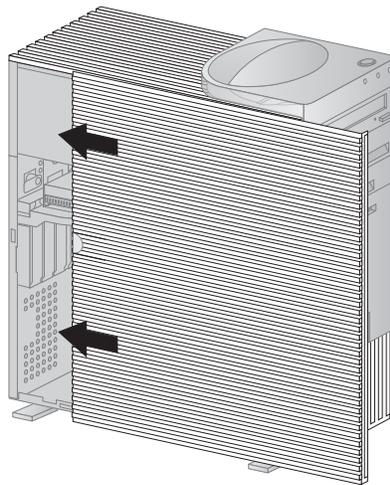
5 If a cover lock is present, go to the back of the computer and lock the cover.

6 Reconnect the external cables and cords to the computer.
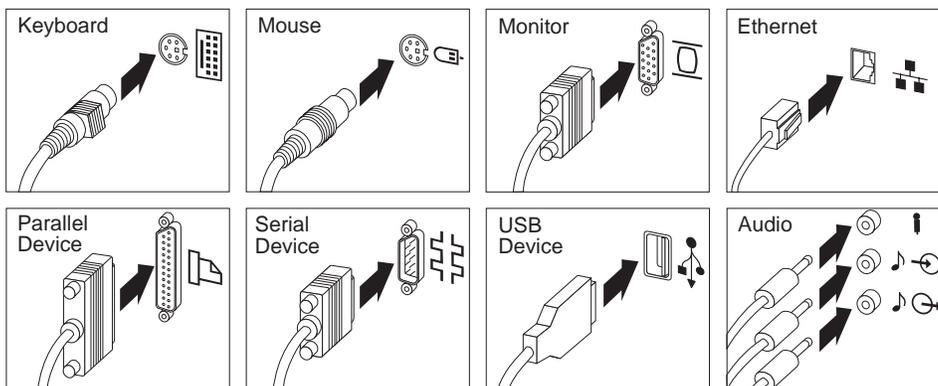
Note: Your computer might not have all the connectors shown.

7 If you have a modem or fax machine attached to the computer, reconnect the telephone line to the wall outlet and the serial port. Plug the power cords into properly grounded electrical outlets.

Important

In the United Kingdom, by law, the telephone cable must be connected after the power cord.

---

8 Update the computer configuration. See "Updating the Computer Configuration."

Note: If an error message related to the chassis-intrusion detector appears after you restart your computer, you must enter the administrator password. For more information, see Appendix A, "Cover and Component Removal Information" on page 73.

Updating the Computer Configuration

Important

The configuration information in this section applies to installing options. For more information on using the Configuration/Setup Utility program, see *Using Your Personal Computer.*

Also, you might need to install device drivers after updating the configuration settings. For more information, see the instructions that come with the option to determine if device drivers are required and how to install them. Also, video device drivers are on the *Software Selections* CD.

After you add, remove, or replace options, you must update the information in the configuration settings. This reconfiguration is performed automatically by the computer (but you must save the changes), or *manually* by you. When the computer automatically configures an option, it uses system programs. If the system programs do not update the settings, you can use the Configuration/Setup Utility program to reconfigure the appropriate settings.

For example, when you start your computer after adding most internal hard disk drives, the settings are automatically updated and you use the Configuration/Setup Utility program to save those changes. However, if a resource conflict arises after an ISA legacy adapter is installed or removed, you must manually update the computer configuration and save the information.

Notes:

1. Make a record of all customized settings before you make any modifications.

2. For more information on error messages from resource conflicts, see *Using Your Personal Computer.*

Starting the Configuration/Setup Utility Program

When you restart the computer for the first time after working with most options, a message appears indicating that a configuration change has occurred. You are then prompted to enter the Configuration/Setup Utility program to manually update the configuration settings or to confirm and save the settings that were automatically updated by the system programs.

After you change an option and restart the computer, the following screen might appear.

```
                          POST Startup Error(s)

         The following error(s) were detected when the system was
         started:

          162 Configuration Change Has Occurred

         Select one of the following:

         Continue
         Exit Setup
```
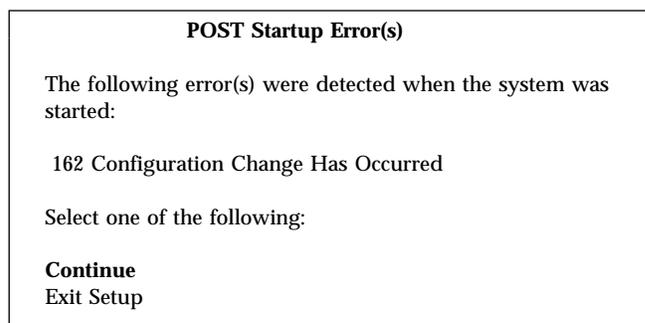
Note: Depending on the configuration changes that occurred, the error message you see might be different from the one shown here.

If the preceding screen appears, select **Continue** until you reach the Configuration/Setup Utility menu and then go to "Changing Settings and Exiting" on page 70.

If the preceding screen does not appear, use the following procedures to access the Configuration/Setup Utility menu. To access the Configuration/Setup Utility program:

1 Turn on the computer.

   If your computer is on when you start this procedure, you must shut down the operating system, turn off the computer and wait a few seconds, and then restart the computer. Do not use **Ctrl**+**Alt**+**Del** to restart the computer.

2 When the Configuration/Setup Utility prompt appears in the lower left corner of the screen, press **F1**.

    a. If you have *not* set an administrator password, the Configuration/Setup Utility program menu appears. If you have set an administrator password, type the administrator password and press **Enter**.

    b. If you have set both an administrator and a power-on password, you can type either of the passwords at the password prompt. However, if you type your power-on password, you can *view* limited information in the Configuration/Setup Utility program, but you cannot *change* settings. To change settings in the Configuration/Setup Utility program, type your administrator password at the password prompt.

```
┌────────────────────────────────────────────┐
│         Configuration/Setup Utility        │
├────────────────────────────────────────────┤
│                                            │
│              Select Option:                │
│                                            │
│          • System Summary                  │
│          • Product Data                    │
│          • Devices and I/O Ports           │
│          • Start Options                   │
│          • Date and Time                   │
│          • System Security                 │
│          • Advanced Setup                  │
│          • ISA Legacy Resources            │
│          • Power Management                │
│                                            │
│           Save Settings                    │
│           Restore Settings                 │
│           Load Default Settings            │
│                                            │
│           Exit Setup                       │
│                                            │
└────────────────────────────────────────────┘
```
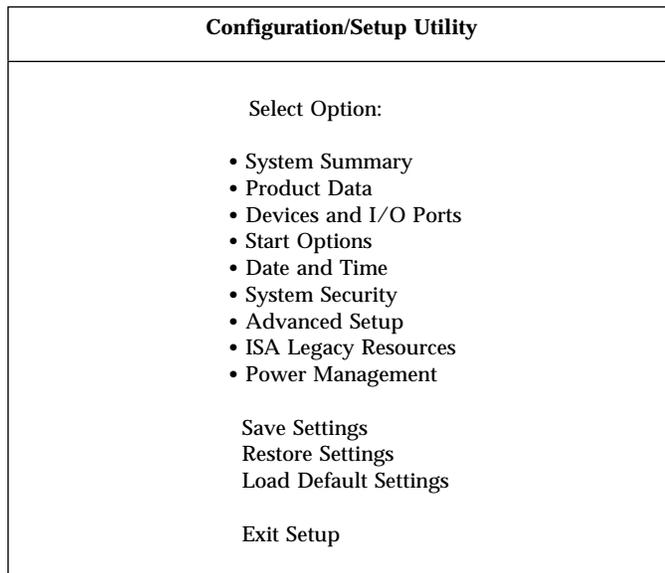
Note: The menu you see on your computer might look slightly different from the menu shown here, but it will operate the same way.

Changing Settings and Exiting

In the Configuration/Setup Utility menus, you can accept the configuration changes by viewing and saving the changes, or you can make manual changes and then save the settings.

The following is a quick reference for identifying symbols in the Configuration/Setup Utility program. For information on the function of keys, see *Using Your Personal Computer.*

- If a bullet (•) is beside a menu item, an additional menu is available.

- Most information enclosed in brackets ([ ]) can be changed. You cannot change information that is not surrounded by [ ].

- If a right arrowhead (▶) is beside a menu item, a configuration change occurred in that category. The ▶ might also appear in subsequent menus.

- If an asterisk (*) is beside a menu item, a resource conflict is detected.

When you complete your changes or finish viewing information, return to the Configuration/Setup Utility menu and select **Save Settings** to save the changes. From this location, you can exit the Configuration/Setup Utility program.

To exit from theConfiguration/Setup Utility program, follow these steps:

1 From the Configuration/Setup Utility menu, press **Esc**.

2 The Exit Setup menu appears. You can save your changes, exit from the Configuration/Setup Utility program without saving your changes, or return to the Configuration/Setup Utility menu. Use the arrow keys to select the desired option and press **Enter**.

Configuring an ISA Legacy Adapter

To configure an installed ISA legacy adapter, you might need to alter switch or jumper settings on the adapter. If there is a conflict, you must use the Configuration/Setup Utility program to set the ISA legacy resource information, such as memory locations, I/O assignments, and DMA and interrupt assignments. For more information about required resources and switch settings, refer to the documentation that comes with the adapter.

To set the legacy resource information for an installed adapter:

1 Start the Configuration/Setup Utility program (see "Starting the Configuration/Setup Utility Program" on page 69).

2 Select **ISA Legacy Resources** from the Configuration/Setup Utility menu.

3 As needed, select **Memory Resources, I/O Port Resources, DMA Resources,** or **Interrupt Resources**.

4 Set the appropriate resource to **ISA Resource**.

5 Press **Esc** to return to the main menu.

6 Select **Save Settings** and press **Enter**.

If you remove an ISA legacy adapter, you must reset the system resources that are no longer being used to **Available**. To do this, follow the above procedures and select **Available** at step 4.

Note: For more information on adapters and resolving conflicts, see "Adapter Configuration" on page 24 and Appendix C, "Interrupt and DMA Resources" on page 76.

Configuring Startup Devices

Startup devices are devices where the computer looks for an operating system when it is powered on. After adding new devices to the computer, you might want to change the sequence of the startup devices. You can use the Configuration/Setup Utility program to change the sequence of startup devices.

To change the sequence of startup devices:

1 Start the Configuration/Setup Utility program (see "Starting the Configuration/Setup Utility Program" on page 69).

2 Select **Start Options** from the Configuration/Setup Utility menu.

3 Select **Startup Sequence**.

4 Select **First Startup Device** from the Primary Startup Sequence.

5 Use the arrow keys to make your selection and press **Enter**.

6 If necessary, repeat step 5 for the **Second Startup Device**, **Third Startup Device**, and **Fourth Startup Device**.

7 If **Automatic Power On Startup Sequence** is enabled, repeat steps 3-5 to select the startup devices for Automatic Power On Startup.

8 Press **Esc** to return to the main menu.

9 Select **Save Settings** and press **Enter**.

Appendix A. Cover and Component Removal Information

Note: The following information is for the PC 300PL model only.

If you have set an administrator password on a PC 300PL system, read the following.

The AssetCare and Asset ID settings in the Configuration/Setup Utility program are enabled when your computer is shipped. If you set an administrator password with the AssetCare and Asset ID settings enabled, the following occurs:

- The chassis-intrusion feature of your computer is enabled. After this, each time you remove the computer cover and subsequently power on the computer, the Power-On Self-Test (POST) notifies you that the cover has been removed. The message displayed on the computer screen is the POST message 176.

  To bypass the message, you must enter the correct administrator password.

- Each time a component that is protected by asset security is removed, and the computer is powered on, a POST message notifies you of the removal. Examples of such components are system memory modules and the microprocessor. The message that displays is the POST message 177.

  To bypass the message, you must enter the correct administrator password.

Important

When enhanced security is enabled, it is vital that you keep a record of your administrator password in a secure place. If you forget or lose the administrator password, the system board in your computer must be replaced in order to regain access to the Configuration/Setup Utility program.

For more information on Enhanced Security and the other security features of your computer, see *Using Your Personal Computer*.

Appendix B. Changing the Battery

If you replace the original lithium battery with a heavy-metal battery or a battery with heavy-metal components, be aware of the following environmental consideration. Batteries and accumulators that contain heavy metals must not be disposed of with normal domestic waste. They will be taken back free of charge by the manufacturer, distributor, or representative, to be recycled or disposed of in a proper manner.

Before you begin

- Read "Electrical Safety" on page 3 and "Handling Static-Sensitive Devices" on page 4.
- Read the instructions that come with the replacement battery.
- Turn off the computer and all connected devices.
- Disconnect all external cables attached to the computer and then remove the computer cover (see "Disconnecting Cables and Removing the Cover" on page 5 if you need additional information).

For information on locating the battery, see "Identifying Parts on the System Board" on page 11.

1 If necessary, remove any adapters or cables that might impede access to the battery. For instructions, see "Removing Adapters from the Riser Card" on page 28.

2 Read "Lithium battery notice" on page vii.

3 Remove the old battery as shown in the following illustrations.
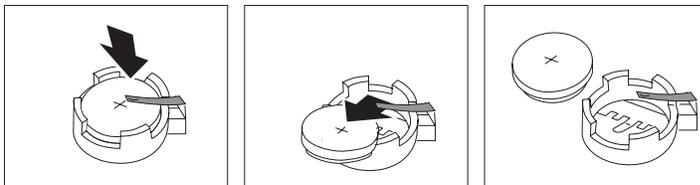
4 Install the new battery as shown in the following illustrations.
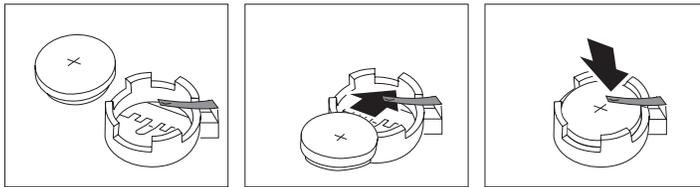
> **Note:** When the computer is turned on for the first time after the battery has been replaced, an error message might be displayed. This is normal.

What to do next

- To work with another option, go to the appropriate section.
- To complete the replacement, go to Chapter 7, "Completing the Installation" on page 66.
- Use the Configuration/Setup Utility program to set the date and time and any passwords. For information on setting the date and time, or setting passwords, refer to *Using Your Personal Computer.*
- Dispose of the old battery as required by local ordinances or regulations.

Appendix C. Interrupt and DMA Resources

This appendix lists the settings for the default interrupt and direct memory access (DMA) resources for both the PC 300PL and PC 300GL.

Note: The interrupt and DMA settings might change under configuration control or can be changed by using the Configuration/Setup Utility program.

Table 2. Interrupt Resources for the PC 300PL	
Interrupt Request	**System Resource**
0	Timer
1	Keyboard
2	Interrupt Controller
3[3]	Serial Port B
4[3]	Serial Port A
5[3]	Audio, if installed
6	Diskette
7[3]	Available
8	Real time clock
9	Available
10	Available
11	Available
12[3]	Mouse
13	Coprocessor
14	IDE Drives (0, 1), if installed
15	IDE Drives (2, 3), if installed

Table 3. DMA Resources for the PC 300PL		
DMA Request	**Data Width**	**System Resource**
0	8 bits	Audio, if installed
1	8 bits	Audio, if installed
2	8 bits	Diskette
3[3]	8 bits	Available
4	–	System Resource
5	16 bits	Available
6	16 bits	Available
7	16 bits	Available

---

[3] Can be modified to alternative settings or disabled.

Table 4. Interrupt Resources for the PC 300GL	
Interrupt Request	**System Resource**
0	Timer
1	Keyboard
2	Interrupt Controller
3	Serial Port B
4	Serial Port A
5	Available
6	Diskette
7	Available
8	Real time clock
9	Available
10	Available
11	Available
12	Mouse
13	Coprocessor
14	IDE Drives (0, 1), if installed
15	IDE Drives (2, 3), if installed

Table 5. DMA Resources for the PC 300GL		
DMA Request	**Data Width**	**System Resource**
0	8 bits	Available
1	8 bits	Available
2	8 bits	Diskette
3	8 bits	Available
4	–	System Resource
5	16 bits	Available
6	16 bits	Available
7	16 bits	Available

Appendix D. Notices

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