

**IBM**

*Aptiva*

**Handbook**

### **First Edition (March 1998)**

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# Safety information

The construction of the IBM Aptiva Personal Computer provides extra protection against the risk of electrical shock. The IBM Aptiva PC has a power cord with a three-prong plug that is required to ground metal parts. It is the responsibility of the person installing the computer to connect it to a properly grounded electrical outlet. Seek professional assistance before using an adapter or extension cord; these devices could interrupt the grounding circuit.

If the computer is connected to an electrical outlet that is incorrectly connected to the building wiring, serious electrical shock could result.

## FOR CONTINUED PROTECTION AGAINST THE RISK OF ELECTRICAL SHOCK:

- Connect your computer only to an electrical outlet of the correct voltage. If you are unsure about the voltage of the electrical outlet you are using, contact your local power company.
- If your computer has cables other than the power cords, you must connect them before plugging the power cords into an electrical outlet. Before removing these cables, you must first unplug the power cords from the outlet.

**Note:**

*In the UK, by law, the telephone line cable must be connected after the power cord.*

*In the UK, by law, the power cord must be disconnected after the telephone line cable.*

- If your computer has a telephone connection, do not touch the telephone cords when there is lightning in the area.
- Do not use or store the computer in an area where it can become wet.
- Make sure all replacement parts have characteristics identical or equivalent to the original parts. Other parts may not have the same safety features.
- Personal injury or electrical shock may result if you undertake actions other than those specifically described in this book. This is particularly true if you try to service or repair the power supply, monitor, or built-in modem. Always refer service or repairs to qualified service personnel.

*Your computer uses lithium batteries. There may be a risk of fire, explosion, or burns if the batteries are handled incorrectly. To ensure safety:*

**Caution:**

- *Do not recharge, disassemble, heat, or incinerate a lithium battery.*
- *Replace the battery with an identical or equivalent type lithium battery.*
- *Discard used lithium batteries according to local country dispositions.*

# Ergonomic information

## Arranging a comfortable and productive work area



## Arranging your work area

When you arrange your computer, position your monitor and keyboard directly in front of you. Try to position the mouse to the side of the keyboard. The keyboard and mouse should be close to your body. Avoid reaching too far to use the keyboard and mouse.

The tower is usually kept on the floor under or beside your desk. Be sure to place it in an area that will not block the space you need to put your legs under the work surface.

Remember to allow space in your work area for other items you might use such as reference books, document holders, notebooks, and diskette or CD-ROM holders.

## Choosing a chair

- Use a chair that gives you good back support.
- When you sit, make sure your thighs are parallel to the floor and your feet are resting flat on the floor or on a footrest. Your knees should form a 90-degree angle.

## Positioning the monitor

- Place the monitor at a comfortable viewing distance, usually 20 to 24 inches away. You can use the length of your arm to determine a comfortable viewing distance.
- Adjust your monitor so the top of the screen is at, or slightly below, eye level.
- Keep the screen clean. For cleaning instructions, refer to the documentation that came with your monitor.
- If you place the monitor near a window, consider using curtains or blinds to minimize glare from sunlight. Also be sure to keep the monitor perpendicular to the windows to reduce glare when the curtains or blinds are open. Try to avoid placing the monitor directly in front of a window.
- Use dim room lighting. If you need more light on your work, you should position the light so it shines on your work surface but not onto the monitor screen.
- Use the monitor controls to adjust the screen's brightness and contrast levels to a comfortable level. You may have to do this more than once a day if the light in the room changes. For monitor control adjustment instructions, refer to the documentation that came with your monitor.
- When your eyes focus on a specific object for a long period of time, they may become tired. If you spend a lot of time looking at your screen, remember to take frequent breaks. Look up periodically and focus on an object that is further away. This will give the muscles in your eyes a chance to relax.

## Positioning the keyboard

- Make sure the keyboard height is comfortable for typing.
- When you type, keep your forearms parallel to the floor and relax your upper arms. Your elbows should form a 90-degree angle.
- Type with a light touch, keeping your hands and fingers relaxed. Your wrists should also be straight.
- If your computer came with a wristrest and you choose to use it, do not rest your hands on the wristrest or desktop while you are typing. Instead, use the wristrest only when resting. If you prefer not to use the wristrest, you may remove it and use the keyboard without it.

## Positioning the mouse

- Position your mouse on the same surface as your keyboard so that they are at the same level. Allow enough space so that you can use your mouse without stretching or leaning over.
- When you use the mouse, hold it lightly with all your fingers and click gently. Move the mouse with your entire arm instead of only using your wrist.

For more detailed information and tips about how to use your computer, refer to the tutorials on your computer or visit the IBM healthy computing web page at:

<http://www.pc.ibm.com/healthycomputing>

# FCC Statement

Federal Communications Commission (FCC) Statement

IBM™ Aptiva™ 2138

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM authorized dealers. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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# United States modem regulations

## FCC and telephone company requirements

If your IBM Aptiva Personal Computer comes with a modem already installed, the following Federal Communications Commission (FCC) and telephone company requirements apply:

1. The modem adapter card is located inside the back of the tower. It complies with Part 68 of the FCC rules. A label is affixed to the built-in modem that contains, among other things, the FCC registration number, USOC, and Ringer Equivalency Number (REN) for this equipment. If these numbers are requested, slide the tower cover forward to see the label, and provide this information to your telephone company.
2. The REN is useful to determine the quantity of devices you may connect to your telephone line and still have those devices ring when your number is called. In most, but not all areas, the sum of the RENs of all devices should not exceed five (5.0). To be certain of the number of devices you may connect to your line, as determined by the REN, you should call your local telephone company to determine the maximum REN for your calling area. The REN for the factory installed modem in your computer is 0.8B.
3. If the built-in modem causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance; if advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.
4. Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If they do, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.
5. If you experience trouble with this built-in modem, check the "FCC and Telephone Company Requirements" section of the *IBM Statement of Limited Warranty, IBM Program License Agreement, and Limited Warranty for Programs* document for information on obtaining service. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected, or until you are sure the equipment is not malfunctioning.
6. No customer repairs are possible to the modem.
7. The modem may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. Contact your state public utility commission or corporation commission for information.
8. When ordering network interface (NI) service from the Local Exchange Carrier, specify service arrangement USOC RJ11C.
9. The Telephone Consumer Protection Act of 1991 makes it unlawful for any person to use a computer or other electronic device to send a message via a telephone fax machine unless such message clearly contains, in a margin at the top or bottom of each transmitted page, or on the first page of the transmission, the date and time it is sent and an identification of the business, or other entity, or other individual sending the message and the telephone number of the sending machine of such business, other entity, or individual. In order to program this information into your computer, you should be sure to follow the installation instructions for your fax software package.



# Canadian modem regulations

## Canadian Department of Communications certification label

**Notice:** The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines, and internal water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

### **CAUTION:**

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

### **LOAD NUMBER (LN)**

The load number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the load of all the devices does not exceed 100. The load number of the built-in modem is 10.

## Étiquette d'homologation du Ministère des Communications du Canada

**AVIS:** L'étiquette du ministère des Communications du Canada identifie le matériel homologué. Cette étiquette certifie que le matériel est conforme à certaines normes de protection, d'exploitation et de sécurité des réseaux de télécommunications. Le ministère n'assure toutefois pas que le matériel fonctionnera à la satisfaction de l'utilisateur.

Avant d'installer ce matériel, l'utilisateur doit s'assurer qu'il est permis de le raccorder aux installations de l'entreprise locale de télécommunications. Le matériel doit également être installé en suivant une méthode acceptée de raccordement. L'abonné ne doit pas oublier qu'il est possible que la conformité aux conditions énoncées ci-dessus n'empêchent pas la dégradation du service dans certaines situations.

Les réparations de matériel homologué doivent être effectuées par un centre d'entretien canadien autorisé désigné par le fournisseur. La compagnie de télécommunications peut demander à l'utilisateur de débrancher un appareil à la suite de réparations ou de modifications effectuées par l'utilisateur ou à cause d'un mauvais fonctionnement.

Pour sa propre protection, l'utilisateur doit s'assurer que tous les fils de mise à la terre de la source d'énergie électrique, des lignes téléphoniques et des canalisations d'eau métalliques, s'il y en a, sont raccordés ensemble. Cette précaution est particulièrement importante dans les régions rurales.

### **CAUTION:**

L'utilisateur ne doit pas tenter de faire ces raccordements lui-même, il doit avoir recours à un service d'inspection des installations électriques ou à un électricien, selon le cas.

### **L'INDICE DE CHARGE (IC)**

L'INDICE DE CHARGE (IC) assigné à chaque dispositif terminal indique, pour éviter toute surcharge, le pourcentage de la charge totale qui peut être raccordé à un circuit téléphonique bouclé utilisé par ce dispositif. L'extrémité du circuit bouclé peut consister en n'importe quelle combinaison de dispositifs pourvu que la somme des INDICES DE CHARGE de l'ensemble des dispositifs ne dépasse pas 100. L'indice de charge du modem intégré est de 10.

# Laser compliance statements

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) 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.*

Opening the CD-ROM drive might result in exposure to hazardous laser radiation. There are no serviceable parts inside the CD-ROM drive.

### **DO NOT OPEN**

The CD-ROM drive contains an embedded Class 3A or 3B laser diode. Note the following:

### **DANGER!**

*Laser radiation when open. Avoid direct eye exposure. Do not stare into beam or view directly with optical instruments.*

# Trademarks

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- HelpWare
- IBM
- Operating System/2
- OS/2

Windows is a trademark of Microsoft Corporation.

Other company, product, and service names, which may be denoted by a double asterisk (\*\*), may be trademarks or service marks of others.



# Learning about this book **Part 1**

This part contains an introduction to the *Aptiva Handbook*. Read this part to understand how to use this book and where to go if you need additional information.

This part contains the following chapter:

- **“Chapter 1: Using this book” on page 1-1**

This chapter explains how the book is organized. It also points you to additional sources of information that are not contained in this book.

---



The Aptiva Handbook contains general information for all users of an IBM Aptiva Personal Computer. Once you have taken your computer out of the box and connected all the components, you can use this book as a guide to your computer's hardware and as a problem-solving tool.

The topics in this book range from an introduction of important Aptiva hardware features to instructions for reconfiguring or upgrading your computer. In addition, if you experience a problem with your Aptiva computer, this book can guide you to a solution.

This book includes information for several Aptiva models. If the model you purchased did not come with some of the hardware mentioned in this book, you will not be able to use the software functions associated with that hardware.

## How this book is organized

This book contains the following parts and chapters:

### Part 1: Learning about this book

This part contains information to help you use the *Aptiva Handbook*. It contains the following chapter:

- “Chapter 1: Using this book” on page 1-1

This chapter contains information about the book's contents and organization. It also points you to other documents or online resources for more information.

### Part 2: Support information

This part is all about the various support and services that the IBM HelpCenter provides. It contains the following chapter:

- “Chapter 2: HelpWare support and services” on page 2-1

This chapter contains details on the IBM HelpWare support and services. It tells you what to do in case you need computer-related assistance or information.

## Part 3: Controlling system settings

This part contains information to help you configure or reconfigure the hardware and hardware features that were installed in your computer at the factory. It includes the following chapters:

- “Chapter 3: Getting started with your Aptiva computer” on page 3-1

This chapter contains instructions for making adjustments to the monitor and the system volume settings on your Aptiva computer. It also provides information to help you connect your computer to a printer or to the Internet.

- “Chapter 4: Power management features” on page 4-1

This chapter describes the software shutdown and suspend features of your Aptiva computer for more efficient power management. It also tells about the monitor standby feature under Windows 95.

- “Chapter 5: BIOS Setup configuration” on page 5-1

This chapter provides instructions for using the Setup Utility, where you can view or change your system’s configuration. It also provides information to help you locate other configuration utilities.

## Part 4: Upgrading and replacing hardware

This part contains information to help you add to or change the hardware that was installed in your computer at the factory. It contains the following chapters:

- “Chapter 6: Preparing to upgrade” on page 6-1

This chapter contains information to help you prepare to add or replace adapter cards, drives, and system board components in your system unit.

- “Chapter 7: Adding and removing adapter cards and drives” on page 7-1

This chapter contains instructions for adding and removing adapter cards and drives.

- “Chapter 8: Adding and replacing system board components” on page 8-1

This chapter contains instructions for adding and replacing hardware components on your system board.



## Part 5: Troubleshooting

This part contains information to help you respond to problems with the hardware, software, and features installed in your computer at the factory. It contains the following chapter:

- “Chapter 9: Diagnosing and recovering from problems” on page 9-1

This chapter provides troubleshooting information, including error code interpretations. It also includes information to help you recover factory-installed programs and files.

## Part 6: Technical reference

This part contains technical information that you might need if you upgrade your computer’s hardware. It contains the following appendices:

- “Appendix A: Specification tables” on page A-1

This appendix contains specific memory, address, interrupt, channel, and port specifications. It also includes connector information.

- “Appendix B: Modem information” on page B-1

This appendix contains information about modems, including AT command set information that you can use if you decide to operate your modem from a Windows 95 DOS box prompt.

- “Appendix C: Monitor terminology” on page C-1

This appendix contains definitions of some of the terms generally used to describe monitor characteristics.

The book also contains an index.

# Presentation conventions used in this book

This book uses the following highlighting conventions to associate special meaning with text:

## Example

Example font indicates text you should type at your keyboard.

## Italics

Italics indicate a new technical term. A definition or explanation of the term follows its first use.

## Bold

Bold indicates the names of keys you should press on the keyboard or screen elements you should click on with the mouse.

Bold also emphasizes hardware labels, such as those used to identify jacks, jumpers, or connectors.

# Where to find more information

The following publications and online documentation contain more information about your computer:

**Setup Poster.** This poster contains instructions to help you unpack, set up, and start using your computer.

## **Program License and Limited Warranty**

**Agreement.** This book contains information about the use of your computer and the software that came with it. It also has information about the terms and conditions of the limited warranty.

**Online documentation.** Your computer comes with different types of online documentation. The software that came preloaded on your computer includes online tutorials and exercises that can help you learn how to use your computer. Help is also available as you use your software. In most software, you can press **F1** for help.

From the Windows 95 desktop, you can search for specific help topics about your computer.

To start your computer's help system, follow these steps:

1. Click on the **Start** button on your desktop.
2. Move your mouse pointer to the **Help** option and click on it.

# Support information **Part 2**

This part is all about the various support and services that the IBM HelpCenter provides.

This part contains the following chapter:

- **“Chapter 2: HelpWare Support and services” on page 2-1**

This chapter contains details on the IBM HelpWare support and services. It tells you what to do in case you need computer-related assistance or information.

---



# HelpWare support and services **2**

## What do I do first?

### What is IBM HelpWare?

IBM HelpWare is a comprehensive set of technical support and service options. These include:

- 24-hour help, 365 days a year
- information by Internet, Bulletin Board System (BBS), fax, and phone

From 30 day “Up and Running” support to help with popular programs, IBM HelpWare has a variety of services and solutions for you. These options are available from IBM whenever you need help for as long as you own your IBM Aptiva Personal Computer. Even when your warranty period expires, HelpWare will still be there to support you with services available for purchase.

Read on to find out what methods of support are available at no additional charge and when charges will apply.

## Need quick help?

There are two ways to get help quickly from IBM:

**Internet**      <http://www.us.pc.ibm.com/aptiva/help/>

**Telephone**      Please refer to the section titled “How and when do I contact the IBM PC HelpCenter?” on page 2-5 for information about the telephone services of HelpWare.

## What can I do on my own?

Sometimes you can quickly solve problems that you may have with your computer. We have given you several different methods you can use to solve problems on your own. If you need to, you can still contact IBM for support. There is more information about telephone support in “How and when do I contact the IBM PC HelpCenter?” on page 2-5.

## Printed documentation

The documentation that came with your computer contains information about solving hardware and software problems. This information begins with the “Quick problem solving chart” on page 9-6 which can help you diagnose hardware and software problems. Once you know the nature of the problem, you can follow the instructions in “Solving hardware and software problems” on page 9-7. Just match the description or error code with your question and follow the instructions to solve the problem.

## Online documentation

Your computer also came with several online resources that you can use to solve problems.

### Help files

The operating system and most preloaded programs in your computer contain online help files. These files contain information about upgrading hardware, using software and many other common computer tasks. The help files also contain information for questions on how to solve problems and prevent future trouble.

### Readme files

Most operating systems and software programs also come with a file named README.TXT. This is a text file that contains important information about the program. You can read README.TXT files by opening them in any text editor on your computer.

## Software

Your computer comes with software programs which can help you solve problems or find answers to your questions.

### Diagnostics

Your computer comes with a diagnostic program to help you identify problems that you may have in your computer. You can run the *PC Doctor* diagnostic program from the Windows 95 Start menu under Programs, or the *Applications* CD-ROM.

### IBM Update Connector

This program allows you to connect to the IBM PC HelpCenter to receive updates for some of the software that came with your system and download them. Once you have received the files, you can begin the automated installation process. IBM Update Connector is available to registered Aptiva customers during the warranty period at no additional charge. Telephone line charges may apply.

### Aptiva Installer

This program allows you to easily install and uninstall programs on your computer. If you install a program with *Aptiva Installer* and you begin to have problems because of the program you added, you may be able to use the uninstall feature to cleanly erase all of the files related to the program.

# How do I get help electronically?

## Electronic support

There are many different ways to receive technical support and information if you have questions or problems. Electronic support is easy to use, quick, and very thorough. Best of all, the only charges that typically apply are the ones you pay to your telephone company or the company you use to log onto the World Wide Web. Here are some of the electronic support options that you can use.

### Internet

You can use the World Wide Web (WWW) to contact us on the Internet. When you link to the IBM Aptiva PC support home page, you can search for technical tips, download update drivers and find out about many other things.

You can visit the IBM Aptiva PC support Internet site at this URL:

**<http://www.us.pc.ibm.com/aptiva/help/>**

## Online services

Online services are companies which provide a wide variety of services like electronic mail, newsgroup, and special forums. These companies often provide IBM forums where customers can receive technical support and information about IBM products.

### America Online

If you want to use America Online to find information related to IBM products and services, use the "Go to" keyword **IBM Connection**.

### Prodigy

If you want to use Prodigy to find information related to IBM products and services, use the Jump command. Type **IBM club** and then select **PC Product Support**.

### CompuServe

If you want to use CompuServe to find information related to IBM products and services, use the "GO" word **IBM**. Then, from the main area, type **Aptiva** to get to the Aptiva support forum.

## Bulletin boards

You can use a Bulletin Board System (BBS) to look at public messaging areas, electronic conferences, and searchable databases. You can also download files for Operating System updates and drivers. There are many other areas of the BBS that contain helpful information and answers to frequently-asked questions. You might find some of these topics on a BBS:

- PC user groups
- PC questions and answers
- Problem solving
- Technical information

You can reach the IBM Personal Systems Group BBS 24 hours a day, 7 days a week. There is no charge from IBM to use the BBS. However, long distance telephone charges may apply.

- In the United States, call 1-919-517-0001
- In Canada:
  - In Markham, call 905-316-4255
  - In Montreal, call 514-938-3022
  - In Toronto, call 416-956-7877
  - In Vancouver, call 604-664-6464
  - In Winnipeg, call 204-934-2735

## Automated fax

In the United States and Canada, if you have a touch-tone telephone and access to a fax machine, you can receive information by fax 24 hours a day, 7 days a week.

To access the Automated Fax System:

- In the United States, call 1-800-426-3395.
- In Canada, call 1-800-465-3299.

Follow the recorded instructions, and the information you request will be sent to the fax machine you specify.

A catalog (approximately 40 pages) of Automated Fax topics is available.



# How and when do I contact the IBM PC HelpCenter?

## What help can I get by telephone?

Sometimes you may have a problem that you just can not solve and we understand that it can be frustrating. This document contains several problem solving options you can use. See the “Quick problem solving chart” on page 9-6 before you call the IBM PC HelpCenter. If you have completed the problem solving steps in the “Solving hardware and software problems” on page 9-7 and you still need help, you may need to call the IBM PC HelpCenter.

Depending on the type of problem, system experts are available to help answer your questions. There may be charges for some calls and not for others. This section contains information about which calls you will be charged for and which calls you will not.

## 30 day “Up and Running” support

If you have questions about setting up your system, we are here to help. Within the first 30 days that you have your computer, you can call us at no additional charge to ask questions about:

- setting up your system and attaching a monitor and printer
- starting the preloaded operating system
- starting the preloaded and bundled software programs

We will calculate the 30 days from the date of purchase.

## Software technical support

If you need help setting up or installing preloaded or bundled software programs during the 30-day “Up and Running” period, technical support representatives will help you install (or reinstall) the software that came with your computer if necessary. HelpWare support will ensure that the program is successfully loaded so that you can start the program. Support for your “how to” questions about software programs is available for a fee. For more information, see “How and when do I purchase additional support?” on page 2-8.

## Additional support

There are times you may need additional assistance after the 30 day “Up and Running” support period. You may also require “how to” help and support as you use your Aptiva PC. In these cases, IBM PC HelpCenter technicians can assist you for a fee. For more information, see “How and when do I purchase additional support?” on page 2-8.

## Hardware warranty service

In some cases, the Aptiva PC that you purchased may not function as warranted. If this happens, during the period of your warranty, the IBM PC HelpCenter will provide warranty service for IBM factory-installed hardware.

Your Aptiva is subject to the terms of the *IBM Statement of Limited Warranty* and *IBM Program License Agreement* which are included with your computer. Read these terms carefully.

If your computer needs to be serviced, please provide the servicer with the Aptiva *Product Recovery CD-ROM* that came with your computer. This will help the servicer to complete the required service.

If your computer is having a problem that is not covered by the warranty, see “How and when do I purchase additional support?” on page 2-8.

## Before you call...

The information in the following three steps will provide the IBM PC HelpCenter technical support representative with valuable information that will assist them when handling your call. It will also help reduce the amount of time it takes to diagnose problems and answer questions.

- 1.** Register your computer with the online IBM Registration form that came installed on your computer.
- 2.** If you are able to run the *PC Doctor* diagnostics, locate the log file (the file type will be “.log”) and have it available for the technical support representative to review.
- 3.** If you have not already done so, you will be required to register your computer the first time you contact IBM. You will be required to provide the following information:

Name \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_

Telephone number \_\_\_\_\_

Machine type and model \_\_\_\_\_

Serial number \_\_\_\_\_

Registration number \_\_\_\_\_  
(when you receive one)

Date of purchase \_\_\_\_\_

**Important:**

*Make sure that you write down your date of purchase and keep your receipt in a safe place. You may be required to present your proof of purchase to receive service under your limited warranty.*

*To find your machine type and model as well as your serial number, look on the bottom of the system unit.*

- description of the problem
- exact wording of any error messages
- system hardware and software configuration information

If your call is not covered by the 30 day “Up and Running” support or the limited warranty, you may be required to provide a major credit card number for support. You will not be billed if it is determined that your call is covered under the “Up and Running” support or the limited warranty.

Please be at your computer when you call.

HelpWare services are available 24 hours a day, 365 days a year (response times may vary).

- In the United States and Puerto Rico, call 1-800-772-2227.
- In Canada, call 1-800-565-3344.
- In all other countries, contact your IBM reseller or IBM marketing representative for telephone numbers, services and hours of operation.

The support representative can also fax or mail additional technical or product information to you, such as:

- sales information
- product brochures
- locations of IBM resellers
- services available through IBM

If you need help with a specific program or if you need help after your warranty has ended, these services are available for a fee. For more information about additional services, see “How and when do I purchase additional support?” on page 2-8.

# How and when do I purchase additional support?

## Purchasing additional HelpWare services

During and after the warranty period for your computer, you can purchase additional HelpWare services. Our Enhanced PC Support Line service includes assistance with the following items:

- assistance with installing, configuring, and using selected applications
- assistance with installing and configuring selected non-IBM peripherals
- using the operating system
- tuning performance (e.g. memory management)
- installing device drivers remotely
- setting up and using multimedia drivers
- installing and configuring out-of-warranty IBM PC products

## You can purchase support in the following ways:

### 900 number

To receive immediate support from an IBM PC HelpCenter technical support representative, you can call the 1-900 number. Your local telephone company will bill by the minute for each call. Persons under age 18 must have permission of a parent or legal guardian prior to placing the call.

In the **United States**, call **1-900-555-HELP (4357)** 9am to 9pm Monday through Friday EST. The current rate is \$2.99 (US currency) per minute beginning after the first minute.

In **Canada**, call **1-900-565-9988** 24 hours a day. The current rate is \$3.50 (Canadian currency) per minute beginning after the first minute.

### Single call

The single call option allows you to pay a flat fee for each individual problem you need to resolve. This option is payable only by credit card.

### 3-incident pack

The 3-incident pack allows you to purchase a block of problem resolutions at a discount from the single call price. This option is payable only by credit card. The 3-incident pack expires one year from the date of purchase.

## 10-incident pack

The 10-incident pack allows you to purchase a block of problem resolutions at a discount from the single call price. This option is payable only by credit card. The 10-incident pack expires one year from the date of purchase.

An incident is a request for telephone assistance about a single question or problem. An incident may involve multiple conversations or actions which may include (but are not limited to):

- your initial request
- research by IBM
- a call back from IBM to you

Requests for assistance on multiple questions or problems will be considered as multiple incidents.

## To order additional support packages:

In the United States, call 1-800-772-2227. Use the following part numbers:

**2419720** for a single call  
**2419721** for a 3-incident pack  
**2419722** for a 10-incident pack

In Canada, call 1-800-565-3344. Use the following part numbers:

**EPCS1** for a single call  
**EPCS3** for a 3-incident pack  
**EPCS10** for a 10-incident pack

In all other countries, contact your IBM reseller or IBM marketing representative.

## For more information

The Enhanced PC Support Line service is available for products on the Supported Products list. To receive a brochure of the Enhanced PC Support Line service or a Supported Products list from our automated fax system:

In the United States:

- 1.** Call 1-800-426-3395.
- 2.** Select option 1.
- 3.** Select option 1.
- 4.** Enter one of the following document numbers:
  - For a brochure, enter 11690 and press the # key.
  - For a supported products list, enter 11682 and press the # key.
- 5.** When finished, press 1.
- 6.** Enter your fax number and press the # key.

In Canada, contact IBM Helpfax:

- 1.** Call 1-800-465-3299.
- 2.** Select the appropriate language.
- 3.** Select option 1.
- 4.** Select option 1.
- 5.** Enter one of the following document numbers:
  - For a brochure, enter 16129.
  - For a supported products list, enter 16130.
- 6.** Follow the instructions given to complete the call.

In all other countries, contact your IBM reseller or IBM marketing representative.



# Controlling system settings **Part 3**

This part contains information to help you configure or reconfigure the hardware and hardware features that were installed in your computer at the factory. It contains the following chapters:

- **“Chapter 3: Getting started with your Aptiva computer” on page 3-1**

This chapter contains instructions for making adjustments to monitor and volume settings on your Aptiva computer. It also provides information to help you connect your computer to a printer or to other computer systems, such as the Internet.

- **“Chapter 4: Power management features” on page 4-1**

This chapter describes the software shutdown and suspend features of your Aptiva computer for more efficient power management. It also tells about the monitor standby feature under Windows 95.

- **“Chapter 5: BIOS Setup configuration” on page 5-1**

This chapter provides instructions for using the Configuration/Setup Utility, through which you can view or change your system’s configuration. It also provides information to help you locate other configuration utilities.

---





# Getting started with your Aptiva computer 3

When you purchased and set up your IBM Aptiva Personal Computer, it was ready for you to use the first time you turned it on. As you begin to use your computer, though, you might want to make adjustments to your monitor and volume settings for optimal comfort and performance. You can also connect your computer to a printer or the Internet.

This chapter contains the following sections to help you make these adjustments and connections:

- “Controlling monitor settings” on page 3-1
- “Controlling volume” on page 3-6
- “Getting ready to print” on page 3-8
- “Setting up communications” on page 3-9
- “Configuring your Aptiva computer for a connection to the Internet” on page 3-10

## Controlling monitor settings

When you connected your monitor to your system unit and turned your computer on for the first time, your computer automatically selected settings for monitor performance. Depending on the monitor you have, you might want to change some of these settings for optimal performance. Using Windows 95, you can customize the refresh rate, screen resolution, number of colors, and the size of displayed characters.

If you have not done so already, follow the setup instructions on the *Setup Poster* to connect the monitor to the system unit. Refer to the documentation that came with your monitor for model-specific monitor information and configuration settings.

# Getting the best performance from your monitor

Follow these guidelines to get the best performance from your monitor:

- Place your monitor away from sources of magnetic interference, such as other monitors, unshielded speakers, and electric power lines. (If your computer came with speakers, those speakers are shielded.)
- Keep the monitor screen clean by using a nonabrasive screen or glass cleaner. Do not spray the cleaner directly onto the screen.
- Under some conditions, interference patterns, such as curved, shadowy lines can occur. If these patterns appear on your screen, change your software program's background color or design.
- To extend the life of your monitor, turn it off at the end of each day.
- Check the documentation that came with your software programs to see if it will let you select combinations of resolution and color. This could make viewing the screen more comfortable.

# Power saver feature

Your monitor documentation should indicate whether your monitor has a power saver feature. This feature may be called Display Power Management Signaling (DPMS). With DPMS, the monitor's display goes blank if you have not used your computer for a predetermined period of time. To redisplay the screen, press the **shift** key on your keyboard or move the mouse.

If your monitor has a power saver feature, you can set the energy saving features of the monitor in the Control Panel in Windows 95. See the section "Monitor standby" on page 4-3 for instructions on using this feature.

# Changing display settings

The first time you turn on your computer, it automatically selects common settings for your monitor. If your monitor supports Display Data Channel (DDC), the computer automatically selects the best refresh rate your monitor can support. The refresh rate determines how quickly the screen image is drawn on the screen. This setting can be changed.

If you purchased a monitor that does not support DDC, you may want to change your monitor's refresh rate setting. With any monitor, you may want to customize one or more display properties.

## Customizing display properties

In Windows 95, you can change display options such as screen resolution, number of colors, refresh rate, and the size of displayed characters.

If you need assistance in selecting display properties, highlight an area of the Display Properties window and press the **F1** key to read about the selected topic.

To customize your display properties:

- 1.** Double-click on the **My Computer** icon on your desktop.
- 2.** In the My Computer window, double-click on the **Control Panel** folder.
- 3.** In the Control Panel window, double-click on the **Display** icon.

- 4.** In the Display Properties window, click on the **Settings** tab.

In the Settings tab of the Display Properties window, you can set the following display properties:

- **Scheme**  
Allows you to select a color scheme for your desktop.
- **Color palette**  
Lets you specify the number of colors that can be displayed on the screen.
- **Font size**  
Lets you specify the size of the characters displayed on the screen.  
You should generally use the default setting for font size since some programs were not designed to work with large fonts.
- **Display area**
  - **Screen**  
Lets you specify the screen resolution. The resolution setting determines the amount of information that can be displayed on your screen. The larger the resolution setting numbers, the more you can see on your screen, but the smaller the images on the screen appear.

The values you can choose for screen area (resolution) and colors will be limited by:

- Your monitor's maximum horizontal and vertical frequencies.
- The amount of video memory available on the computer's system board.

To find out how much video memory your system uses, go to Setup. For these instructions, see "Viewing system information and product data" on page 5-5.

- Desktop

Lets you specify the total viewable area. This area can be larger than the size of your screen. If you select a desktop area that is larger than the size of your screen, your desktop will "scroll" as you move the mouse or cursor beyond the edge of the screen area.

**Note:**

*Windows 95 may reset the desktop area to the size of the screen when you restart the system.*

- Scheme Hot Key

You can specify different schemes (for example: resolution, color, font size) for your computer. Once you specify the settings you want to use, you can assign a scheme name and shortcut key or "hot key" sequence. You can use the hot keys to change schemes without entering the Display Properties window. In some cases, you will be prompted to restart Windows 95 when you select a scheme.

## Changing refresh rate settings for monitors with DDC support

The refresh rate is the rate at which the entire image is drawn on the screen. If you purchased a monitor that supports DDC, this rate is automatically selected for optimum performance. If you need to manually select a monitor refresh rate, follow these instructions:

- 1.** From the "Display Properties" window, click on the **Adjustments** tab.
- 2.** Click on **Refresh Rate...**
- 3.** From the "Change Refresh Rate" window, click on the refresh rate you want your monitor to use.
- 4.** Click **Change**, then click **OK**.

If you select a setting that is greater than the capabilities of your monitor, the image may become distorted. If the image becomes distorted, click **Cancel**. If you do not click **Yes** within ten seconds after selecting an unsupported resolution setting, the computer will return to the last supported resolution.

**Note:**

*You should select the highest (fastest) refresh rate supported by the monitor you purchased. For information on supported refresh rates, refer to the documentation that came with your monitor.*

## Changing refresh rate settings for monitors without DDC support

If your monitor does not support the DDC feature, this rate is automatically set to the default settings.

If your monitor has capabilities greater than VGA, you may want to change the refresh rate setting. To select a monitor refresh rate, follow these instructions:

- 1.** From the “Display Properties” window, click on the **Adjustments** tab.
- 2.** Click on **Refresh Rate...**
- 3.** From the “Change Refresh Rate” window, click on **Show all refresh rates**.

Windows will warn you about using a refresh rate that is not compatible with your monitor. When you have read the message, click **OK**.

- 4.** Click on the refresh rate you want your monitor to use.
- 5.** Click **Change**, then click **OK**.

If you select a setting that is greater than the capabilities of your monitor, the image may become distorted. If the image becomes distorted, click **Cancel**. If you do not click **Yes** within ten seconds after selecting an unsupported resolution setting, the computer will return to the last supported resolution.

## Tips for choosing display properties

Of the settings that your monitor supports, you should select the ones that are most comfortable for you to work with. The highest resolution and color settings are not always best. For example:

- Higher resolutions display more pels (picture elements). While this allows more text and graphics to be displayed, it makes them appear smaller. For most users, 640x480 or 800x600 is a comfortable resolution setting.
- When you select more colors, most software programs will slow down. Choose only as many colors as you need.
- You can determine which settings are most comfortable to work with by selecting and trying each one.
- While your monitor resolution may allow you to change the font size, some programs do not support large fonts. Large fonts may cause words to appear cut off or pushed together.

## Using the Windows Help function to select display properties

Windows Help provides instructions for choosing monitor settings. To select display properties, follow these steps:

1. From the Windows 95 desktop, click on the **Start** button.
2. Click on **Help**.

The Windows Help folder appears.

3. Click on the **Index** tab.
4. In the first box, type:

monitor

5. The second box will automatically display a list of tasks related to the monitor. Select the task you want and click on the **Display** button for instructions.

If you want to return to the Index list, click on the **Help Topics** button.

## Controlling volume

If you purchased a multimedia computer with a CD-ROM drive, your computer may have volume controls in up to three different locations:

- On one of the speakers
- In the multimedia software that came with your system.
- On the CD-ROM drive on the front of the system unit

Your system may not have this volume control. This volume control is used only to control headphone volume and has no effect on the speakers.

The control you use depends on whether you are listening to sound through the speakers or the headphones.


## Adjusting the speaker volume

If you are listening to sound through the speakers, use the volume control on the front of the speaker to adjust the volume.

The volume control on the front of the speaker is affected by the volume control setting in the multimedia software that came with your computer. For example, if you turn the volume on the speaker up, and no sound comes out of the speakers, the volume setting in your multimedia software might be too low. The multimedia software volume controls are located in the multimedia mixer programs.

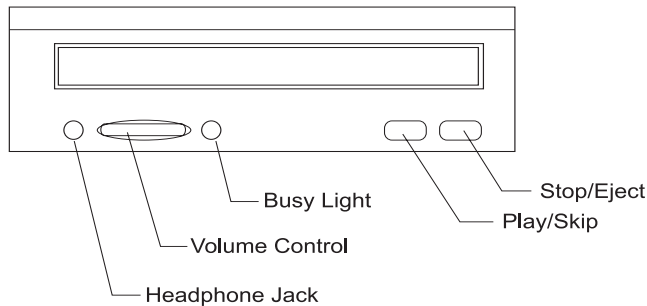
# Adjusting the headphone volume

You may be able to plug headphones into the headphone jack on the CD-ROM drive (not available on all systems) or into the line-out jack on the back of the computer's system

unit. The line-out jack is marked with the icon .

- On some IBM Aptiva PCs, a headphone jack and a volume control are located on the CD-ROM drive on the front of the computer's system unit.

**Note:** *The CD-ROM drive in the computer that you purchased may not include all of these lights and controls.*



When your headphones are plugged into the headphone jack on the CD-ROM drive, they will pick up only the sound coming from an ordinary audio CD in the CD-ROM drive. The headphones will not pick up other sounds generated from your computer or any external device connected to the computer, such as a MIDI (Musical Instrument Digital Interface) keyboard.

When your headphones are plugged into this jack, use the volume control on the CD-ROM drive to adjust the volume of the headphones. This volume control adjusts the volume of the headphones, but not the speakers. If you want to turn the speaker volume down while using the headphones, use the volume control on the speaker.

- On all models of the IBM Aptiva PC, the headphones can be plugged into the line-out jack on the back of the system unit. This is the same jack you plug your speakers into. You must disconnect your speakers to use this jack with your headphones.

If you plug your headphones into the jack on the back of the system unit, the headphones will pick up all sounds generated from your computer and any external devices connected to the computer, such as a MIDI (musical) keyboard. The headphones will also pick up sound coming from a CD in the CD-ROM drive.

**Note:** *When your headphones are plugged into the jack on the back of the system unit, you must control the headphone volume through the volume control in the multimedia software on your computer. You cannot control the headphone volume from the volume control on the CD-ROM drive.*

*When using this jack, a few sounds may not be audible through the headphones, such as the beep when you turn on your computer.*

# Getting ready to print

After you have attached your printer to your computer as described on the *Setup poster*, you need to install the correct printer driver for the operating system you are using. A *printer driver* is a file that describes the characteristics of your printer to the software. The software then uses the file to convert your text and graphics into a form that your printer can understand.

Windows 95 contains printer drivers for many popular printers. If you find that Windows 95 does not have the driver for your printer, use the printer drivers provided with the printer.

Windows Help provides instructions for installing the driver for your printer. To access these instructions, follow these steps:

1. From the Windows 95 desktop, click on the **Start** button.
2. Click on **Help**.
3. The “Windows Help” folder appears.
4. Click on the **Index** tab at the top of the folder.
5. In the first box, type:

printer

6. The second box automatically displays a list of tasks related to the printer. Select “printer drivers, installing” and click on the **Display** button for instructions.

**Note:**

*If you want to return to the Index list after reading the printer drivers entry, click on the **Help Topics** button.*

7. As you follow the instructions, you will need to indicate:

- The manufacturer and the model of your printer. If you do not see the manufacturer or model name of your printer in the list, see if your printer came with a diskette that has a driver for Windows 95. If so, follow the instructions for using the diskette.

Or, your printer may have an emulation mode that allows it to print like one of the printers in the list. Look in the documentation that came with your printer to find information on emulation modes. Then select the name of one of the printers it can emulate in this list.

- The default port for your printer. Select the LPT1: Printer port option.



# Setting up communications

If your computer has a fax/data modem, it can communicate with other computers, fax machines, and telephones.

Some IBM Aptiva computers have a modem already installed. However, if your computer package comes with a modem but it is not installed, open the system and install the modem first. Refer to sections “Opening the system unit” on page 6-4 and “Adding and removing adapter cards” on page 7-3 for instructions.

Before your computer can use its modem, you must complete two procedures in the following sections:

- Connect the modem to the telephone network
- Configure your computer’s communications software

## Connecting your modem to the telephone network

Modems are designed to operate over the *public switched telephone network* (PSTN or PSN). This is an *analog network* commonly used by most households. Connect the modem to an analog network only. If you are not sure about your telephone line, contact your local telephone company.

Before you connect your modem to a telephone network, read the safety notices in “Safety information” on page xi.

### **Warning!**

- *Excessive voltages can occur on telephone lines, especially during lightning storms. To avoid any possible damage to sensitive electronic parts, unplug the computer and the telephone cords during such storms.*
- *Some businesses, schools, and buildings have digital telephone systems, known as digital private branch exchange (PBX) systems. These systems do not work with the modem. Connecting your modem to a digital telephone system might damage the modem.*

The telephone line your modem uses cannot be used for any other purpose while the modem is operating. Any interruption on the line your computer is using will stop computer communications. You should not pick up a telephone on the same line your computer is using. You must also disable any Call Waiting features on your telephone service. Contact your local telephone company for information about how to disable Call Waiting. Your telephone company might have a dialing sequence procedure that lets you temporarily suspend Call Waiting.

If your computer's telephone line connection is interrupted during modem operation, you must clear the telephone line and restart the communication. If you were sending a fax, you must resend the fax. If you were dialed into a network (communicating with other computers), you must redial.

## Configuring your communications software

Your Aptiva computer can run software that allows you to use the system as a telephone or a fax machine. To configure your computer to operate as a fax machine, see the Windows 95 online help.

Your Aptiva also comes with software that lets you connect to the Internet. Proceed to the next section "Configuring your Aptiva computer for a connection to the Internet".

If you decide not to use a communications software program, you can still use your modem. See "Modem commands" on page B-5 for information about typing AT commands in a Windows 95 Terminal program or a Windows 95 DOS box. If you need more information about modems, see "Modem features" on page B-1.

# Configuring your Aptiva computer for a connection to the Internet

If your Aptiva computer is equipped with a modem, you can connect to the Internet. First, you must connect your computer to the telephone network and configure your communications software. See the preceding section "Setting up communications" on page 3-9 for information about these tasks.

You can connect to the Internet using the IBM Global Network, The Microsoft Network, or any other Internet service provider. Internet service provider and line charges may apply.

# The IBM Global Network

The IBM Global Network is IBM's online service that gives you easy access to the Internet. Once you have configured your Aptiva to connect to the Internet, you can access a wide variety of online information. Other online services include electronic mail, news groups (BBS), World Wide Web, and a lot more.

If you find Netscape in any of the following places,

- Netscape icon on your Windows 95 desktop
- Netscape icon in the Online Services folder on your Windows 95 desktop
- Netscape item in the Windows 95 Start menu

follow these steps to connect to the Internet through the IBM Global Network.

- 1.** Click on the **Netscape** icon or on the **Internet Explorer** icon on your Windows 95 desktop.

If you don't find the Netscape icon on your desktop, proceed to the next section "The Microsoft Network."

- 2.** When the IBM Global Network screen appears, click on the text **Sign up...** to display the online instructions on how to set up your computer.
- 3.** Follow the onscreen instructions. If you need assistance, press the **F1** key to display the online help.

# The Microsoft Network

You can also use a Windows 95 program to configure a dial-up connection to The Microsoft Network. Follow these steps if you want to become a member of The Microsoft Network.

- 1.** From the Windows 95 desktop, double-click on the **The Microsoft Network** icon.

If this icon does not appear on your desktop, click on **Start** then on **Programs**. From the list of programs, select **The Microsoft Network** option.

- 2.** Follow the onscreen instructions. If you need assistance, press the **F1** key to display the online help.

# The Internet Connection Wizard

Your Aptiva computer comes with a program that guides you through the steps for connecting to the Internet. You can use this program, called a wizard, to set up an Internet connection using The Microsoft Network or any other service provider.

Follow these steps to use the Internet Connection Wizard:

- 1.** From the Windows 95 desktop, click on the **Start** button.
- 2.** Move your mouse pointer to the **Programs** menu, then to the **Accessories** menu, and finally the **Internet tools** menu.
- 3.** Click on the **Internet Connection Wizard** option.

The wizard lists the information that you need to collect for your connection and then takes you through the steps required to connect. Follow the onscreen instructions. If you need assistance, press **F1** to display the online help.

# Power management features **4**

Your Aptiva computer supports the following power management features:

- **Software shutdown.** Your computer can be powered off using either Windows 95 or the power button on the front of the system. To avoid data loss, it is recommended that you use Windows 95 when you shut down the computer. The power indicator light is off when the computer is shut down.
- **System suspend.** This feature allows you to put your computer into a low power state and then resume operation from where you left off. You can put the system into suspend mode using the Windows 95 Start menu or using the power button. Before you use the power button to enter suspend, you must change the required setting in Setup. Refer to the section "System suspend" on page 4-2 for more information.
- **Monitor standby.** This feature allows the monitor to save energy when you are using Windows 95 standby.

## Software shutdown

### Using the software shutdown feature

Follow these steps to use the software shutdown feature:

- 1.** Click on the **Start** button on the lower left corner of the Windows 95 screen.

**Important:**

*Make sure that you have saved your work before doing the next step. Selecting **Shut Down...** completely turns off the computer and all unsaved data will be lost.*

- 2.** Click on **Shut Down...** to display a confirmation screen with a list of options.
- 3.** Select the option **Shut down the computer?**. Then click on **Yes**. This action completely turns off the system power without pressing the power button on the front panel.

# System suspend

Your computer supports the system suspend feature. This feature lets the computer enter a low power state. You can put the system in suspend mode in two ways:

- using the Windows 95 Start menu
- using the power button

Under suspend mode, programs that are running will go to a suspended state but will not shut down. The power indicator light will flash approximately once per second.

## Using the Windows 95 Start menu

Follow these steps to bring the system into suspend mode using Windows 95:

- 1.** From your Windows 95 desktop, click on the **Start** button.
- 2.** Click on **Suspend**.

To bring your system out of suspend mode, press the **shift** key on the keyboard or move the mouse.

Your computer's BIOS includes another level of power management that you can set under Setup. For more information, see "Power management" on page 5-11.

## Using the power button

By default, the power button simply turns the system on or off. However, setting the Power switch < 4 sec. parameter to Suspend allows you to use the power button to put the system in suspend mode. Refer to the section "Power switch < 4 sec." on page 5-12 for the setting instructions.

After making the necessary setting change in Setup, you can use the power button to enter system suspend mode by pressing the button for less than four seconds while the computer is on.

**Note:**

*The above step works only when the system is already on.*

To bring the system out of suspend mode, press any key on the keyboard or move the mouse.

The system will wake up if a call comes into the modem while the system is in suspend mode. Refer to the section "Modem Wake-Up on Ring" on page 4-3 for more information on this feature.

Take note of the following when using the power button for the system suspend feature.

### **When the system is in "normal on" state**

- Pressing the power button for more than four seconds turns off the system power.
- Pressing the power button for less than four seconds brings the system into suspend mode.

### **When the system is in “suspend” mode**

- Pressing the power button for more than four seconds turns off the system power.
- Any normal IRQ event, such as keyboard or mouse movement or a modem ring in, wakes up the system from suspend mode and returns it to the “normal on” state.

**Note:**

*While the system is in suspend mode, pressing the power button for less than four seconds does not wake the system up.*

### **When the system is in “normal off” state**

- Pressing the power button, regardless of the length of time you press it (less than or more than four seconds), simply turns the system power on.

## Modem Wake-Up on Ring

The Modem Wake-Up on Ring feature enables the system to automatically wake up and return to the “normal on” state in the event of an incoming modem access while the system is in suspend mode. You may enable or disable this feature in Setup. See the section “Modem Wake-Up on Ring” on page 5-12 for more details.

## Monitor standby

Windows 95 provides a monitor energy saving feature. If your monitor supports this function (see your monitor documentation for information), perform the following steps to set the power saving features of your monitor.

- 1.** Click on the **Start** button on your desktop.
- 2.** Select **Settings**, then click on **Control Panel**.

You can also double-click on **My Computer** icon to display the My Computer window. Double-click on the **Control Panel** icon.

- 3.** From the Control Panel window, double-click on the **Display** icon to show the Display Properties window.
- 4.** Select the tab **Screen Saver**.
- 5.** On the lower section where you see Energy saving features of monitor, click on the boxes beside the items **Low-power standby** and the **Shut-off monitor**. Then specify the number of minutes before the monitor enters standby or completely shuts off.

To re-display the screen, press the **Shift** key or move the mouse.





# BIOS Setup configuration **5**

## Configuration/Setup Utility overview

Your IBM Aptiva Personal Computer is already configured for immediate use. You can view your computer's configuration settings using the Configuration/Setup Utility and the Windows 95 Device Manager.

You can also use these configuration utilities to change some configuration settings. For instance, if you add or replace hardware inside your system unit, you might need to verify or update specific settings. For information about working with your system unit's hardware, see "Part 4: Upgrading and replacing hardware".

This chapter contains the following sections to help you reconfigure and optimize your computer:

- "Configuration/Setup Utility overview" on page 5-1
- "Entering Setup" on page 5-3
- "Working with the Setup menus" on page 5-4
- "Setup parameters" on page 5-7
- "Using other configuration utilities" on page 5-18

The Configuration/Setup Utility lets you view and change important information about your computer and its hardware. You might need to use Setup if you upgrade the hardware in your computer or if you get an error message while using your computer.

**Note:**

*For simplification, the Configuration/Setup Utility will be referred to simply as "Setup" throughout this handbook.*

In most circumstances, when you add or replace hardware in your system unit, your computer's Basic Input/Output System (BIOS) detects the hardware changes and updates Setup parameters automatically. In some cases, however, especially if you purchase hardware that does not meet Plug and Play requirements, you might need to manually change the configuration information in Setup. If you add or remove hardware, an online message may ask you to check Setup to verify that automatic detection made the correct configuration changes.

You can use the Setup menus to view information about your system's hardware configuration. In general, the Setup menus contain information on the following:

- Processor type and speed
- System memory
- Diskette, hard disk, and CD-ROM drives
- Serial and parallel ports
- Plug and Play options
- Startup options
- Model information
- Date and time settings
- Security options
- Power management options

Some of the parameters and related settings in Setup are for reference only, such as those items in the System Information and Product Data menus. Refer to the section "Viewing system information and product data" on page 5-5 for details on these menus.

The configurable options allow you to control how your computer operates. For example, you can use Setup to:

- Configure hard disk or CD-ROM drives
- Select and configure I/O devices
- Enable or disable the power management mode
- Customize startup options
- Set date and time
- Create or change a power-on password
- Enable or disable cache options
- Set resource assignments for PCI adapter cards and other system devices
- Load Setup default settings

# Entering Setup

## When the computer is on

Follow these steps to enter Setup when the computer is on:

- 1.** Save all open files and close all running applications.
- 2.** Click on the **Start** button from your Windows 95 desktop.
- 3.** Click on the **Shut Down...** option.
- 4.** From the window that appears, click on the option **Restart the computer?**
- 5.** When you see the IBM logo and the line message “Press F1 to enter Setup”, press **F1** to enter Setup and display the main menu.

**Note:** | *You cannot enter Setup after the Power On Self Test (POST) is complete.*

If you have previously set a power-on password, you are prompted to type in the password after you press the F1 key. See the section “Power-on password” on page 5-14 for information on setting, changing, or removing the password.

## When the computer is off

Follow these steps to enter Setup when the computer is off:

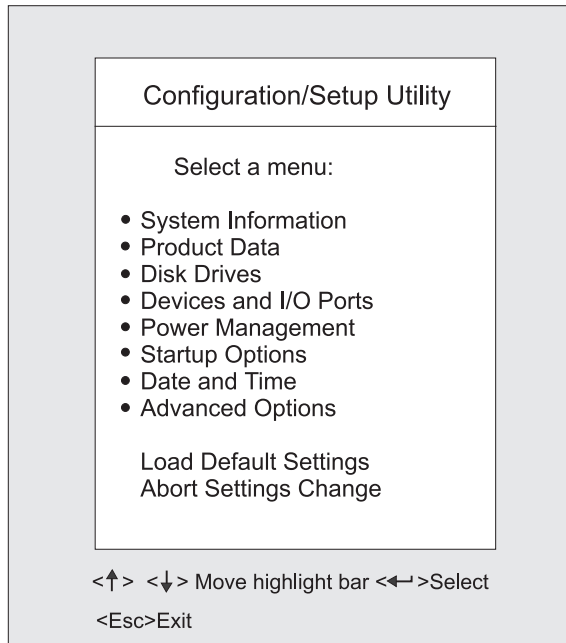
- 1.** Turn on your monitor.
- 2.** Turn on the system unit.
- 3.** When you see the IBM logo and the line message “Press F1 to enter Setup”, press **F1** to enter Setup and display the main menu.

If you have previously set a power-on password, you are prompted to type in the password after you press the F1 key. See the section “Power-on password” on page 5-14 for information on setting, changing, or removing the password.

# Working with the Setup menus

The Setup main menu appears immediately after you press F1.

## Setup main menu



**Note:**

*The main menu that you see on your computer may look slightly different from the menu shown here, but the options will operate just the same.*

The Setup main menu lists system configuration options. When you select one of these options, a menu for that option appears.

An option usually has only one menu, although some can have more than one. In options with multiple menus, use the **PgDn** and **PgUp** keys to move from one menu to another.

The following table lists specific keys on the keyboard that will help you move through the Setup menus:

Keys	Function
↑ ↓	Use these arrow keys to highlight a parameter in a menu. (Press the Enter key to choose the option.)
← →	Use these arrow keys to change a setting. In some menus, you can use these keys to move from one field to another.
<b>PgUp</b>	Press this key to move from a menu to the menu immediately preceding it. This key works only in options with multiple menus.
<b>PgDn</b>	Press this key to move from a menu to the menu immediately following it. This key works only in options with multiple menus.
<b>Enter</b>	Press this key to select a highlighted parameter from a menu.
<b>Esc</b>	After viewing or making changes to the settings on a menu, press this key to exit the menu.
<b>F1</b>	Press this key if you want help for a selected item in a menu.

**Note:**

*Not all of the above keys are available on every menu. The available keys in a menu appear on the bottom of that menu.*

## Viewing system information and product data

To view general hardware information about your computer, select the **System Information** option from the Setup main menu. The items displayed in the System Information menu are not configurable.

Setup automatically updates this menu when you do either of the following:

- Add or change hardware on your computer
- Make changes to other menus in Setup and save those changes

To view other computer information such as the model number, serial number, and BIOS version and date, select the **Product Data** option from the Setup main menu. Like in the System Information menu, the items displayed are not configurable.

## Changing parameter settings

In the Setup menus, all configuration information that you can change is enclosed in brackets like these: [ ]. You cannot change any information that is not enclosed in brackets. Use the up- or down-arrow keys to highlight options then press **Enter** to display a menu. When changing the setting of a particular parameter, highlight the setting then use the left- or right-arrow key to change the setting. Refer to the section “Setup parameters” on page 5-7 for details on the configurable parameters in each menu.

## Loading the default settings

When you purchase an Aptiva computer, it is already configured for use. The original configuration settings, also called *factory or default settings*, are stored in the CMOS. Setup includes an option Load Default Settings that lets you reload the original configuration at any time.

If you have made changes in Setup but would like to restore the default settings, follow these steps:

- 1.** From the main menu, highlight the option **Load Default Settings** then press **Enter**. A dialog box appears confirming if you want to load the default settings.
- 2.** Use the left arrow key to select **Yes**, then press **Enter**.
- 3.** Press **Esc** to exit Setup.  
  
A dialog box appears saying “Settings have been changed. Do you want to save CMOS settings?”
- 4.** Use the left arrow key to select **Yes**, then press **Enter** to save the changes in CMOS.

You must load the Setup default settings in the following instances:

- when you replace the system battery
- when you customize your system configuration settings and some resource assignments conflict causing the computer to stop responding

## Aborting setting changes

There may be times when you have made changes in the Setup parameter settings but decided to discard the changes. The option Abort Settings Change allows you to do this without exiting Setup.

To abort the changes that you have made, follow these steps:

- 1.** Return to the Setup main menu
- 2.** Highlight the **Abort Settings Change** option then press **Enter**.

BIOS then clears all the changes that you made and resets the parameters to their previous settings. These settings are the settings which were in place when you started Setup.

## Exiting Setup

Press **Esc** to return to the main menu when you have finished viewing settings and making changes. From this location, you can exit Setup and save your changes or exit without saving your changes.

Follow these steps to exit Setup:

- 1.** From the main menu, press the **Esc** key.
- 2.** The Exit Setup dialog box appears. If you have made changes in the parameter settings, it will contain an option for saving your changes.
  - If you would like to save your changes, press the left arrow key to select the option **Yes** then press **Enter** to save your changes and exit Setup.
  - If you do not want to save your changes, press the right arrow key to select the option **No** then press **Enter**, to exit Setup without saving.

# Setup parameters

## Disk drives

If you install a new diskette, hard disk, or CD-ROM drive, BIOS automatically detects the presence of these devices. Enter Setup to identify or verify the type of drive installed in the computer. Refer to the section “Entering Setup” on page 5-3. From the Setup main menu, select the option **System Information** to display a screen with a list of the system devices installed. The device settings in this screen are not configurable.

If you want to change any drive setting, select **Disk Drives** from the main menu. The Disk Drives menu appears showing the diskette drive and IDE drive parameters.

### Diskette drive (A or B)

These options display the size and storage capacity of the currently installed diskette drive. Empty drive bays are indicated with a “None” setting. Your Aptiva computer comes with a diskette drive A with the default setting 1.44MB 3.5-inch. If you add an additional diskette drive, it will be designated as diskette drive B.

## IDE hard disk and CD-ROM drives

The Disk Drives menu includes four IDE drive items that allow you to configure the hard disk drives and the CD-ROM drive. Selecting any one of these items displays a submenu with details on a particular IDE drive.

The IDE drive items are identified as follows:

- *IDE Primary Channel Master* is attached to IDE connector 1 on the system board and set as the master device. This is the hard disk that comes preinstalled with your computer.
- *IDE Primary Channel Slave* (if installed) is attached to IDE connector 1 on the system board and set as the slave device.
- *IDE Secondary Channel Master* (if installed) is attached to IDE connector 2 on the system board and set as the master device.
- *IDE Secondary Channel Slave* (if installed) is attached to IDE connector 2 on the system board and set as the slave device. Normally, a preinstalled CD-ROM drive is connected here.

Proceed to the next page for details on the parameters under each IDE drive submenu.

## Type

This item specifies the number of cylinders, heads, and sectors, and the size of a particular IDE drive. If no information appears opposite the parameters, there is no drive installed in that channel.

## Hard disk block mode

This function enhances disk performance depending on the hard disk in use. BIOS automatically detects if your hard disk supports this feature.

The Auto setting allows data transfer in blocks (multiple sectors) to increase the data transfer rate. If your system does not boot after setting this parameter to Auto, change the setting to Disabled. The default setting for this parameter is Auto.

## Advanced PIO mode

The advanced PIO mode feature improves system performance by allowing the use of faster hard disk drives. If your hard disk supports this feature, you may set this parameter to Auto (default), Mode 0, Mode 1, Mode 2, Mode 3, or Mode 4 depending on the hard disk requirements. See the documentation that came with the hard disk.

## Hard disk size > 504MB

This enhanced IDE feature works only under DOS and Windows environments. If set to Auto, which is the default, BIOS allows you to use a hard disk with a capacity of more than 504MB. This is made possible through the Logical Block Address (LBA) mode translation. You may be required to set this parameter to Disabled if you use other operating systems.

To prevent data loss, set this parameter to Auto if you are using a hard disk with more than 504MB capacity that was previously configured through the LBA mode. If you use a hard disk configured through the user-specific Cylinder-Head-Sector (CHS) mode, set this parameter to Disabled.

## Hard disk 32-bit access

Setting this parameter to Enabled improves system performance by allowing the use of the 32-bit hard disk access. This enhanced IDE feature only works under DOS, Windows 3.x, Windows 95, and Novell NetWare. If your software does not support this function, set this parameter to Disabled. The default setting is Enabled.



# Devices and I/O Ports

From the Setup main menu, select the **Devices and I/O Ports** option to view or change port configuration settings. The Devices and I/O Ports menu appears. This menu lets you configure serial and parallel ports.

Also included in this menu are items for enabling or disabling the onboard controller chipsets.

## Onboard communication ports

### Serial Port

Your computer comes with a 9-pin serial port. This parameter is set to Enabled which is the default serial port setting. The default setting base address is 2F8. The default IRQ is 3.

If you install a modem or a serial port adapter card, use this parameter to make any changes to the serial port address which may be needed to avoid conflicts with additional hardware. If you change the serial port address, you might also need to make changes in the software that uses the serial port. For instructions on changing your software, see the user's guide or online documentation that came with the software.

### Parallel port

Your computer comes with one parallel port. This parameter is set to Enabled which is the default parallel port setting. The default base address is 378h. The default IRQ is 7.

If you install an adapter card with a parallel port, use this menu to make sure that each parallel port has a different address. If you change parallel port addresses in this menu, you might also need to make changes in the software that uses the parallel port. For instructions on changing your software, see the user's guide or online information that came with the software.

#### *Operation mode*

As long as the parallel port setting is not disabled, this item allows you to choose an operation mode for the parallel port. You can select either the Standard mode or one of the extended modes (Bidirectional, EPP, or ECP) for a parallel port operation mode. The extended modes increase the efficiency of your parallel port; however, these modes use recent technology and are only supported by newer hardware (such as some printer models). The available modes are:

- **Standard.** This mode allows for one-way operation at a normal speed, and is the default setting.
- **Bidirectional.** This mode allows for two-way operation at a normal speed.
- **EPP.** This mode allows for bidirectional parallel port operation at a maximum speed.

- **ECP.** This mode uses data compression which allows the parallel port to operate in a bidirectional mode and at a speed higher than the maximum data transfer rate.

If you change the mode of a parallel port on an adapter card, you might need to make changes to the port's adapter card and its software. See the user's guide or online documentation that came with the adapter card.

### *ECP DMA channel*

This item becomes active only if you select ECP as the operation mode. It allows you to select DMA channel 1 or DMA channel 3 depending on the available system resource.

## Onboard floppy disk controller

This parameter allows you to enable or disable the onboard floppy disk controller. When set to Enabled, which is the default setting, the controller enables the diskette drive in your computer. When set to Disabled, the controller deactivates the drive and simultaneously frees IRQ 6 which is normally assigned to the diskette drive. You may then assign IRQ 6 to another device.

## Onboard IDE primary channel

This parameter allows you to enable or disable the onboard IDE primary channel controller. Setting this parameter to Enabled lets you use the primary IDE connector (IDE 1) to connect up to two IDE drives. Setting it to Disabled deactivates IDE 1 and frees IRQ 14 for the use of other devices. The default setting is Enabled.

**Note:**

*When you set the Onboard IDE Primary Channel parameter to Disabled, the Onboard IDE Secondary Channel parameter turns gray and non-configurable.*

## Onboard IDE secondary channel

This parameter allows you to enable or disable the onboard IDE secondary channel controller. Setting this parameter to Enabled lets you use the secondary IDE connector (IDE 2) to connect up to two IDE drives. Setting it to Disabled deactivates IDE 2 and frees IRQ 15 for the use of other devices. The default setting is Enabled.

## Onboard PS/2 mouse (IRQ12)

This parameter enables or disables the onboard PS/2 mouse controller. When set to Enabled, which is the default setting, it allows you to use the onboard PS/2 mouse. When set to Disabled, it deactivates the mouse and frees IRQ 12 for the use of other devices.

## Onboard USB

This parameter allows you to enable or disable the Universal Serial Bus (USB) controller. The default setting is Enabled.

### USB legacy mode

This parameter enables or disables the USB legacy mode. This item turns gray and is non-configurable when the Onboard USB parameter is set to Disabled. The default setting is Disabled.

## Onboard audio chip

This parameter enables or disables the onboard audio controller chipset. This item does not appear in the menu if there is no physical audio chipset on the system board. The default setting is Enabled.

## Power management

The system power management feature allows you to reduce power consumption.

### Power management mode

When the Power Management Mode parameter is set to Enabled, you can configure the different power saving timers to your desired settings. Setting this parameter to Disabled deactivates the power management feature and all the timers. The default setting is Enabled.

### IDE hard disk standby timer

This parameter allows the hard disk to enter standby mode after inactivity of 1 to 15 minutes, depending on your setting. When you access the hard disk again, allow 3 to 5 seconds (depending on the hard disk) for the system to recover and return to normal speed. The default setting is Off.

### System sleep timer

This timer allows you to set the period of inactivity (in minutes) before the system enters the sleep state. Use the arrow keys to select a setting. You can turn this timer to Off if you prefer. The default setting is 60 minutes.

## *Stop CPU clock in sleep state*

When set to Yes, the system internal clock stops, along with other internal devices, when the computer enters the sleep state. When set to No, the system internal clock continues to run when the system is in the sleep state. This item turns gray and is non-configurable when the System Sleep Timer is off. The default setting is Yes.

## **Power switch < 4 sec.**

When set to Suspend, this parameter adds the suspend function to the system power button on the front panel. The suspend function allows you to put the system into suspend mode by pressing the power button for less than four seconds while the system is on. When this parameter is set to Power off, the power button simply turns the system power on or off. This parameter is set to Power off by default.

## **Modem Wake-Up on Ring**

This parameter allows you to enable or disable the Modem Wake-Up on Ring feature. If the computer is in suspend and this parameter is enabled, the computer will automatically resume the normal power on mode when it receives an incoming call. When disabled, the system does not return to the “normal on” state even if there is an incoming modem access. The default setting is Enabled.

# **Startup options**

From the Setup main menu, select **Startup Options** to view or change startup configuration settings. The Startup Options menu appears. This menu identifies the startup devices.

## **Fast POST mode**

When set to Auto, which is the default, this parameter allows the system to boot faster by skipping some power on self-test (POST) routines.

## **Silent boot**

This parameter enables or disables the silent boot function. When set to Enabled, which is the default, BIOS is in graphical mode and displays the IBM logo while booting. If an error occurs while booting, the system automatically switches to text mode.

Even if your setting is Enabled, you may also switch to the text mode while booting by pressing **F9** after you see the message “Press <F1> to go to the Setup Utility”.

When set to Disabled, BIOS is in the conventional text mode where you see the system initialization details on the screen.

## Num Lock after boot

This parameter displays whether the NumLock function on the keyboard turns on automatically each time you turn your computer on. You can set this to Enabled or Disabled. The default is Enabled.

## Memory test

When set to Enabled, this parameter allows the system to perform a RAM test during the POST routine. When set to Disabled, the system detects only the memory size and bypasses the test routine. The default setting is Disabled.

When the Fast POST Mode parameter is set to Auto, the Memory Test parameter is disabled and becomes non-configurable.

## System boot drive

This parameter has four options.

### *Drive A Then C*

In this option, the system BIOS checks drive A first. If there is a diskette in the drive, the system boots from drive A. If there is no diskette, the system boots from drive C. This is the default setting.

### *Drive C Then A*

In this option, the system BIOS checks drive C first. If there is no hard disk drive, the system boots from drive A.

### *Drive A Only*

This option directs BIOS to boot up the system from drive A.

### *Drive C Only*

This option directs BIOS to boot up the system from drive C.

## Boot from CD-ROM

When enabled, this parameter prompts BIOS to look first for a bootable CD in the CD-ROM drive. If a bootable CD is present, the system boots from the CD-ROM. If there is no CD, the system boots from the drive specified in the System Boot Drive parameter. The default setting is Enabled.

**Important:**

*This option must be enabled to start the system from the Product Recovery CD-ROM.*

## Date and time

From the Setup main menu, select the Date and Time option to view or change the system clock from the Date and Time menu. If you want to change the system date, enter the date in the format shown on the screen as in the following example:

Tue Nov 10, 1998

If you change the time, enter the time in 24-hour format (hours, minutes, seconds). For example:

- 12 midnight is 00:00:00
- 12 noon is 12:00:00
- 1 p.m. is 13:00:00

When setting date and time, press the up- or down- arrow key to highlight a field. Press the left or right-arrow key to change the settings.

## Advanced options

From the Setup main menu, select the Advanced Options option to view or change a variety of configuration settings. The Advanced Options menu appears, with the following options:

- Security Options
- Memory/Cache Options
- PnP/PCI Options

Each of these options opens an additional menu.

### Security options

The Security Options menu lets you change the settings of the following parameters:

- Power-on Password
- Disk Drive Control

### Power-on password

Select this parameter and press the left- or right arrow key to display the Power-on Password window. In this window, you can set up a password to restrict the use of your computer. You can also change or remove the password.

If you set up a power-on password, you must type this password each time you turn on your computer. If you do not type the correct password, you cannot use your computer. You must also type this password if you want to enter Setup.

*Setting a power-on password*

1. Enter Setup. See “Entering Setup” on page 5-3.
2. From the Setup main menu, select **Advanced Options**, then **Security Options**.
3. Highlight the **Power-on Password** parameter and press the left- or right-arrow key to display the Power-on Password window.
4. Type a password consisting of up to seven characters, then press **Enter**.

**Important:**

*Be careful when typing and retyping the password. The characters do not appear on the screen as you type.*

5. Retype the password then press **Enter**.
6. Press **Enter** again to confirm setting the password. Pressing **Esc** aborts the password setting.

After pressing Enter, the Power-on Password window disappears. The Power-on Password parameter is automatically set to Present.

**Important:**

*Once you set a password, be sure to write it down and put it in a safe place.*

7. Press **Esc** to return to the Setup main menu.
8. Press **Esc** to exit Setup and reboot the system. Answer **Yes** when prompted to save settings.

If you change your mind and decide not set a password, just answer **No** when prompted to save settings.

The next time you turn on the system, you will be prompted to enter your power-on password. If you press **F1** during POST to enter Setup, you must type the password as well.

### *Changing the power-on password*

1. Enter Setup. See “Entering Setup” on page 5-3.
2. Type your current password when prompted and press **Enter**.
3. From the Setup main menu, select **Advanced Options**, then **Security Options**.
4. Highlight the **Power-on Password** parameter and press the left- or right-arrow key **twice** to display the Power-on Password window.
5. Type in a new password then press **Enter**.
6. Retype the new password then press **Enter**.
7. Press **Enter** again to confirm changing the password.
8. Press **Esc** twice to return to the Setup main menu.
9. Press **Esc** to exit Setup and reboot the system. Answer **Yes** when prompted to save settings.

If you change your mind and decide not to change your password, just answer **No** when prompted to save settings.

## Removing the power-on password

1. Enter Setup and select **Advanced Options**, then **Security Options**.
2. Press the left- or right arrow key once to select **None**.
3. Press **Esc** to return to Setup main menu.
4. Press **Esc** to exit Setup and reboot the system.  
Answer **Yes** when prompted to save CMOS settings.

## Disk drive control

There are two items under this parameter: Diskette Drive and Hard Disk Drive. These items allow you to write protect the diskette and hard disk drives.

The settings include:

- Write protect all sectors - disables the write function for all sectors of the diskette or hard disk drive.
- Write protect boot sector - disables the write function only on the boot sector of the diskette or hard disk drive.
- Normal - allows the diskette or hard disk drive to function normally. This is the default setting.

## Memory/cache options

The Memory/Cache Options menu allows you to configure the internal and external caches. Enabling the cache parameters optimizes system performance.

Some older programs, however, may not run properly with the caches enabled. Set the parameters to Disabled when you run these programs. Disabling the caches will degrade system performance.

### Internal cache

This parameter enables or disables the internal cache memory. The default setting is Enabled.

### External cache

This parameter enables or disables the external cache memory. The default setting is Enabled.

#### *Cache scheme*

This item indicates the cache scheme of the external cache. This is fixed to the setting Write Back and is non-configurable.

The Write Back cache scheme allows updates in the cache but not in the memory when there is a write instruction. The memory is only updated when there is inconsistency between the cache and the memory.



## Maximum cacheable size

This parameter indicates the maximum cacheable size of the external cache.

## Memory parity mode

This parameter allows you to activate the Error Check and Correct (ECC) feature. Select ECC to enable BIOS to detect and correct data errors. Select Disabled if you do not wish to use the feature. The default setting is Disabled.

## PnP/PCI options

The parameters in the PnP/PCI Options menu allow you to set the IRQ assignments for your PCI devices.

### PCI IRQ setting

This parameter allows for automatic or manual configuration of PCI devices. If you use Plug and Play devices, you can keep the default setting as "Auto". The system will automatically configure installed Plug and Play devices.

If you install non-Plug and Play adapter cards, see "Adding and removing adapter cards" on page 7-3.

If you have to configure PCI resources manually, use the up- or down-arrow key to move between fields and select the IRQ assignments using the left- or right-arrow key.

**Note:**

*When the PCI IRQ Setting parameter is set to Auto, all the IRQ setting fields become gray and non-configurable.*

### PCI slots

These parameters allow you to specify the appropriate PCI devices. You may assign IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, IRQ12, IRQ14, or IRQ15 if they have not been previously assigned to other devices. Some IRQs are normally assigned to specific system devices. To avoid resource conflicts, see "System interrupts" on page A-4 to make sure the IRQ that you want to use is available.

### Bus mastering

When set to Enabled, this option allows for the PCI cycles not to pass through the CPU for faster operation. When set to Disabled, all PCI transactions pass through the CPU. The default setting is Enabled.

### PCI IRQ sharing

When set to Yes, this parameter allows you to assign the same IRQ to more than one PCI device installed in the system. When set to No, you must assign different IRQs to the PCI devices. The default setting is Yes.

### VGA palette snoop

The VGA palette snoop function allows the system to refresh all ISA and PCI graphic adapters installed in the system. This is needed if you install an additional graphics overlay card such as an MPEG or an advanced 3D graphics adapter. If the image on your monitor has problems after installing such an adapter, set this parameter to Enabled. Otherwise, leave it set to the default (Disabled) to achieve better performance.

## Plug and Play OS

When this parameter is set to Yes, BIOS initializes only Plug and Play boot devices, then the Plug and Play operating system takes care of the other devices. When set to No, BIOS initializes all Plug and Play boot and non-boot devices.

Set this parameter to Yes if you are using the Windows 95 operating system. Set it to No if you run any other operating system. The default setting is Yes.

## Reset resource assignments

Set this parameter to Yes to avoid IRQ conflicts when installing non-Plug and Play cards. This clears all resource assignments and allows BIOS to reassign resources to all installed Plug and Play devices the next time the system boots. After clearing the resource data, the parameter resets to the default setting No.

Before you install non-Plug and Play cards, set this parameter to Yes, exit Setup and turn off the computer. Then refer to “Installing ISA cards” on page 7-5 for instructions on installing non-Plug and Play adapter cards.

# Using other configuration utilities

You can use Setup to view or change configuration settings for most of your factory-installed hardware. If you install new hardware, however, you might need to use other configuration utilities.

Windows 95 includes a Device Manager utility to help you view or change the system resources used by the hardware installed in your computer. See the section “Using the Windows 95 Device Manager” on page 6-4.

When you purchase new hardware to install in your Aptiva computer, a configuration utility or new drivers may come with the new hardware. See the documentation that comes with the new hardware for instructions.

# Upgrading and replacing hardware **Part 4**

This part contains information to help you add to or change the hardware that was installed in your Aptiva computer at the factory. It contains the following chapters:

- **“Chapter 6: Preparing to upgrade” on page 6-1**

This chapter contains information to help you plan and prepare to add or replace adapter cards, drives, and system board components in your system unit.

- **“Chapter 7: Adding and removing adapter cards and drives” on page 7-1**

This chapter contains instructions for working with adapter cards and drives.

- **“Chapter 8: Adding and replacing system board components” on page 8-1**

This chapter contains instructions for working with the hardware components on your system board.

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# Preparing to upgrade **6**

To upgrade your computer's hardware, you can add or replace cards, drives, or system board components. If you take the time to evaluate your new hardware and plan your hardware changes, you can reduce the effort required to make the changes.

For instance, the type of hardware you plan to add or replace determines whether you begin with your computer turned on or off.

As you prepare to add or replace hardware in your system unit, follow the instructions in these sections:

- “Evaluating your new hardware” on page 6-1
- “Planning your hardware changes” on page 6-3
- “Resolving resource conflicts” on page 6-3
- “Opening the system unit” on page 6-4
- “Looking inside the system unit” on page 6-6

## Evaluating your new hardware

The documentation that came with your new hardware should contain information about required settings and the instructions on how to install the hardware. Study the documentation carefully.

If the documentation refers you to information about your computer's I/O addresses, system interrupt requests (IRQs), or DMA channel assignments, see “Appendix A: Specification tables”.

## For conflicts with system resources used by adapter cards

If you install new hardware in your system, it might attempt to use a system resource that is already assigned.

If you install a PCI adapter card, the system BIOS automatically detects it, assigns an available system resource to it, and configures your computer to use the card. However, some ISA Plug and Play adapter cards require specific system resources. If you install this kind of card, BIOS detects the card but there is a possibility of resource conflict between the new ISA Plug and Play card and a previously installed card. In this case, you will have to manually assign the system resources.

Follow the procedure in the section “Resolving resource conflicts” on page 6-3.

## For conflicts with other system resources

If you install hardware that creates conflicts with other system resources, you may receive an error message the first time you turn on your computer after you have installed the new hardware. If you receive an error message, use the Windows 95 Device Manager to reassign system resources. See the section “Using the Windows 95 Device Manager” on page 6-4 for instructions.

Refer also to “Appendix A: Specification tables” for information on system resources.

# Planning your hardware changes

You should understand how your new hardware will work with your existing hardware before you unplug your system unit, pull the cover off, and start removing or adding hardware. You should also record your changes as you work.

Make sure that you have read the preceding section “Evaluating your new hardware” on page 6-1 before you proceed.

## Recording your changes

When you add or replace hardware, you should record the changes you make. The information you need to record as you work includes, but is not limited to:

- Changes to jumper positions
- Connection of drive and adapter card cables to the system board
- Changes to CMOS settings in Setup
- Changes to settings in other online configuration utilities, such as the Windows 95 Device Manager or a configuration utility that might come with your new hardware.

# Resolving resource conflicts

## Using Setup

Your computer’s Basic Input/Output System (BIOS) automatically detects most hardware changes and then updates the related CMOS configuration settings in Setup. In cases when the CMOS settings are not automatically updated, you receive a message reminding you to manually update the settings.

To resolve resource conflicts between system devices in Setup, follow these steps:

- 1.** Enter Setup. See “Entering Setup” on page 5-3 for instructions.
- 2.** From the Setup main menu, select **Advanced Options**.
- 3.** From the Advanced Options menu, select **PnP/PCI Options**.
- 4.** Highlight the **Reset Resource Assignments** parameter and set it to **Yes** to clear the resource assignments of all installed cards.

After the above steps, proceed to the next section on how to use the Windows 95 Device Manager to assign system resources to your hardware devices.

# Using the Windows 95 Device Manager

Use the Windows 95 Device Manager to verify system device settings or to resolve system resource conflicts, such as those that might occur with Interrupt Request (IRQ) and Direct Memory Access (DMA) resources.

Follow these steps to start the Device Manager and change device settings:

- 1.** From the Windows 95 desktop, double-click on the **My Computer** icon.
- 2.** In the My Computer window, double-click on the **Control Panel** icon.
- 3.** In the Control Panel window, double-click on the **System** icon.
- 4.** In the System Properties window, click on the **Device Manager** tab.
- 5.** Select a device item then click on the **Properties** button. A display box appears showing the properties of the device.
- 6.** Make the necessary changes in the settings that will not conflict with other devices.
- 7.** Click on **OK**.

# Opening the system unit

Each time you open your system unit, you must follow specific safety procedures to ensure that you do not damage your computer.

## Taking safety precautions

For your safety and the safety of your equipment, follow these steps before you remove the system unit cover:

- 1.** If your computer is on, or in 'suspend' mode, shut down the machine.
- 2.** Turn off the monitor and any external components, such as a printer.
- 3.** Unplug all cables from the system unit except the system unit power cord. Be sure to disconnect any telephone line connections as well.

**Note:**

*In the UK, by law, the telephone line cable must be connected after the power cord.*

*In the UK, by law, the power cord must be disconnected after the telephone line cable.*

- 4.** Proceed to the next section for instructions on removing the cover.



# Removing the cover

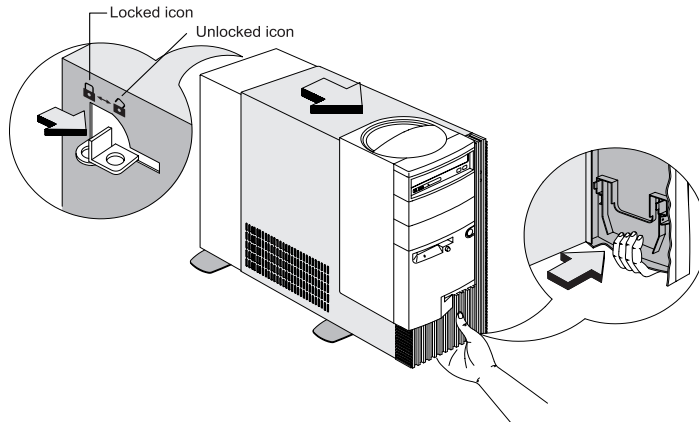
Follow these steps to remove the system unit cover:

- 1.** Release the lock that secures the cover at the back of the unit by pressing it toward the unlocked icon.
- 2.** Slip your hand underneath the front panel and pull on the handle to fully release the cover.

**Note:**

*If you have trouble releasing the lock, make sure that the cover is pushed all the way back.*

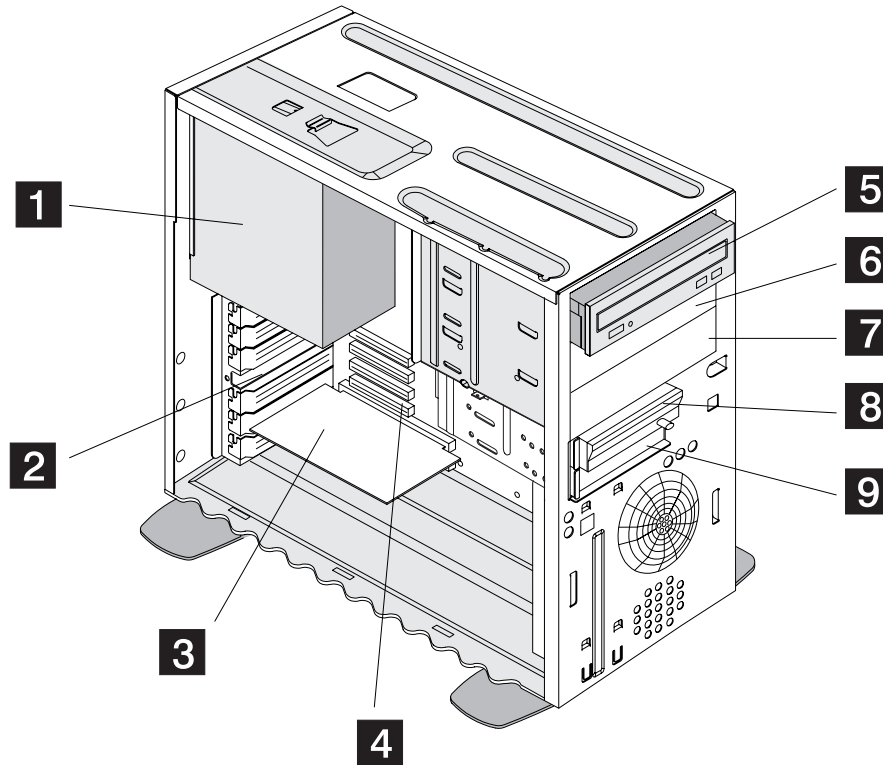
- 3.** Slide the cover forward to remove it completely. The cover slides along grooves that run on the sides of the unit.



- 4.** Touch the bare metal frame of your system unit to dissipate the static electricity from your body. Do not touch any of the components inside the frame before you touch the frame. Do not touch any component with a voltage warning label.
- 5.** Disconnect the system unit power cord.

# Looking inside the system unit

After you remove the system unit cover, the system unit looks like the following figure.



Your computer's system unit has five bays that can hold up to three 5.25-inch and two 3.5-inch drives. You can purchase a drive to install in any empty bay.

Diskette drives use the standard diskette Advanced Technology (AT) interface. Hard disks use an Integrated Drive Electronics (IDE) AT interface. Your computer supports the American National Standards Institute (ANSI) standard for AT attachment disk drives.

It also has adapter card slots for installation of additional expansion cards. You can install Industry Standard Architecture (ISA) and Peripheral Component Interconnect (PCI) adapter cards into the system.

- 1** **Switching power supply.** The system comes with a 200-watt switching power supply.
- 2** **Expansion slots.** On the rear panel of the system unit are seven slot openings for installation of adapter cards. When installing an adapter card with external connectors, remove the cover of the slot that you intend to use.
- 3** **Modem card.** The system may include a K56flex voice fax modem. See "Appendix B: Modem information" on page B-1 for details on modems.
- 4** **System board.** The system board is secured by screws on the inner wall of the chassis.
- 5** **Bay 1.** This drive bay can accommodate a 5.25-inch half-high drive such as a diskette, hard disk, tape, or CD-ROM. Normally, this bay holds a factory-installed CD-ROM drive.

- 6** **Bay 2.** This drive bay can accommodate a 5.25-inch half-high drive such as a diskette, hard disk, tape, or CD-ROM.
- 7** **Bay 3.** This drive bay can accommodate a 5.25-inch half-high drive such as a diskette, hard disk, tape, or CD-ROM.
- 8** **Bay 4.** This drive bay can accommodate a 3.5-inch slim drive such as a diskette or tape. Normally, this bay holds a factory-installed diskette drive.
- 9** **Bay 5.** This drive bay can accommodate a 3.5-inch slim drive such as a diskette, hard disk, or tape drive.



# Adding and removing adapter cards and drives **7**

Before you begin working with the hardware inside your system unit, read the following sections:

- “Evaluating your new hardware” on page 6-1

This section contains the information you need to understand about potential system resource conflicts. Your new hardware might attempt to use a resource that is already assigned to other hardware.

- “Planning your hardware changes” on page 6-3

This section contains important information about planning for hardware changes and recording changed hardware settings. You can avoid repeated steps if you follow the recommendations in this section.

- “Resolving resource conflicts” on page 6-3

This section will help you prevent potential system resource conflicts when you install additional adapter cards or drives.

## Resolving conflicts with installed adapter cards

If you purchased a computer with an installed modem card, this section can help you resolve some potential conflicts between your new hardware and the card.

Using the Windows 95 Device Manager and the documentation that came with your new hardware, compare the resources used by the installed modem card and the new hardware. If both devices attempt to use the same resource, refer to the new hardware’s documentation to change the resource used by the new hardware.

If the resource for the new hardware cannot be changed, change the resource for the modem card in the Device Manager.

# Setting modem card configurations

If your system is equipped with a modem, follow these steps to view or change I/O addresses and interrupt request resources for a port on an installed modem card:

- 1.** Right click on the “My Computer” icon and select **Properties**.
- 2.** In the System Properties window, click on the **Device Manager** tab.
- 3.** Click on **View devices by type**.
- 4.** Double-click on the modem list item to expand the list underneath this item.
- 5.** Double-click on the **LT Win Modem** or **Modem** item in the expanded list.
- 6.** In the LT Win Modem or Modem **Properties** window, click on the **Resources** tab.

If you need help in using the Device Manager, press the **F1** key to view the online help.

You must restart your computer before any Device Manager changes can take effect.

# Working with the hardware in the system unit

If you have not removed the cover from your system unit, see “Opening the system unit” on page 6-4.

If you plan to add both an adapter card and a drive, install or replace the drive before you install or replace the adapter card. If you also plan to make hardware changes on the system board, see Chapter 8 and finish your work with the system board before continuing to work with the drives and adapter cards.

To add or remove adapter cards or drives in the system unit, complete the instructions in the following sections:

- “Adding and removing adapter cards” on page 7-3
- “Adding and removing drives” on page 7-5

# Adding and removing adapter cards

The system board includes one ISA, three PCI, and one ISA/PCI shared adapter card connectors. You can install a maximum of five adapter cards in the system unit.

**Important:**

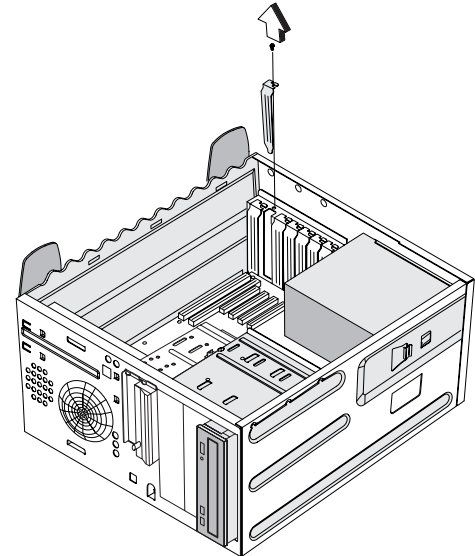
*Make sure that you have followed the proper procedure in "Opening the system unit" on page 6-4. This ensures that you discharge the static electricity that you may have accumulated.*

## Installing adapter cards

See "Identifying adapter card connectors" on page 8-4 for information on which adapter card connector to use.

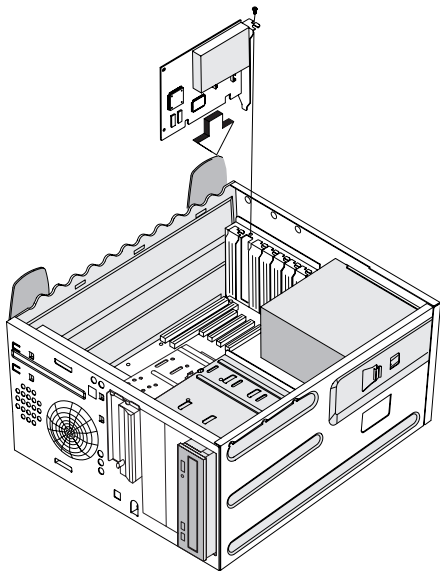
Follow these steps to install an adapter card:

- 1.** Remove the screw that secures the adapter card slot cover. Then remove the slot cover.



- 2.** Align and insert the adapter card into the adapter card connector.

3. Secure the card with the screw that you removed in step 1.



4. Reinstall all hardware and screws that you removed prior to the installation of the adapter card.

For more information on the types of adapter cards that you can install to the specific card connectors, refer to the section “Identifying adapter card connectors” on page 8-4.

## Connecting card cables

If you have not already done so, connect the cable or cables from the adapter card to the correct connection on the system board or CD-ROM drive.

If you disconnected any cables to gain access to the adapter card connector on the system board, reconnect the cables.

## Removing adapter cards

Follow these steps to remove an adapter card:

1. Position the system unit so that the card is accessible to you.
2. If the adapter card has cables, disconnect them. Be sure to take note of where the cables are connected. You will have to reconnect these cables when you reinstall the card.
3. Remove the adapter card screw.
4. Firmly hold the adapter card and carefully pull it from the card connector.
5. If you are not reinstalling the card, reinstall all hardware and screws that you removed prior to the removal of the adapter card.



## Installing ISA cards

Both Plug and Play and non-Plug and Play ISA cards require specific IRQs. When installing ISA cards, make sure that the IRQs required by these cards are not previously assigned to PCI devices to avoid resource conflicts.

Follow these steps when installing ISA cards:

- 1.** Remove all Plug and Play cards installed in the system.
- 2.** Enter Setup and set the Reset Resource Assignments parameter to Yes to clear the resource data assigned to the Plug and Play devices. Refer to “PnP/PCI options” on page 5-17.
- 3.** Install non-Plug and Play ISA cards.
- 4.** Turn on the system.
- 5.** Use Windows 95, or the ISA Configuration Utility (ICU) if your ISA card came with it, to manually assign the appropriate IRQs to the cards. This ensures that BIOS will not use the resources assigned to the non- Plug and Play ISA cards.  
  
**Note:** | *BIOS configures only Plug and Play cards.*
- 6.** Turn off the system.
- 7.** Install Plug and Play ISA and PCI cards.
- 8.** Turn on the system. This time, BIOS automatically configures the Plug and Play ISA and PCI cards with the remaining free IRQs.

## Adding and removing drives

The system unit has five drive bays to accommodate various types of drives. Some of these bays hold drives that were installed at the factory.

When you purchase a new drive, make sure that you also purchase the appropriate power and signal cables.

See the section “Looking inside the system unit” on page 6-6 for the location and description of the drive bays.

## Removing and replacing bay panels

When you first unpack your computer, all drive bays that do not contain drives are covered with plastic bay panels. These bay panels are attached to the system unit cover (not to the system unit internal frame).

To install an externally accessible drive in a previously unoccupied bay, you must remove the bay panel in front of that bay. If you install a drive that does not require external access, such as a hard disk, you do not need to remove the bay panel. If you remove a drive from a bay and you do not intend to install a new drive immediately, replace the bay panel to cover the bay.

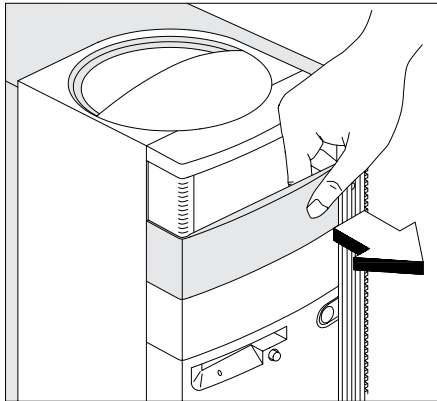
## Removing a bay panel

To remove a plastic bay panel:

1. Remove the system unit cover. Refer to “Opening the system unit” on page 6-4 for instructions.
2. Press the latch on the inner right side of a bay panel and pull it out about an inch. This step releases the right side of the panel.

**Note:**

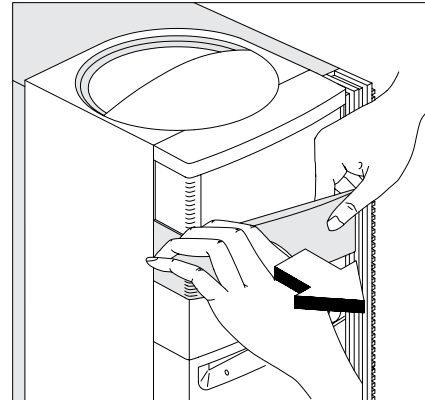
*You may need to temporarily remove the bay panel above the panel you are removing.*



3. Use both hands to pull the bay panel and remove it completely from the system unit cover.

**Caution:**

*Be careful when performing the above step to avoid breaking the latches and tabs on the bay panel. DO NOT force the panel out.*



## Replacing a bay panel

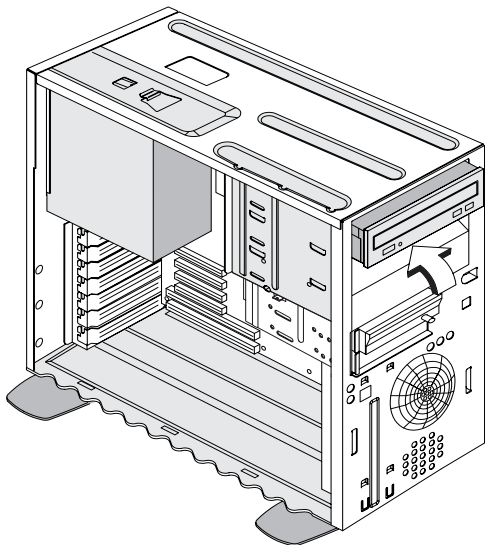
To replace a bay panel in front of an empty drive bay:

1. Fit the left side of the bay panel (the side with the angle) to the left edge of the system unit cover, aligning the panel latches with the groove on the side of the cover.
2. Push the bay panel in until the latch on its inner right side locks the panel into place.

## Pushing back the metal bay covers

After removing the system unit cover, you will see that the empty drive bays on the system unit internal frame still have metal covers. Push back these metal covers to a 90-degree angle before you install disk drives.

**Caution:** *Take extra care when pushing back the metal covers to avoid hurting yourself.*

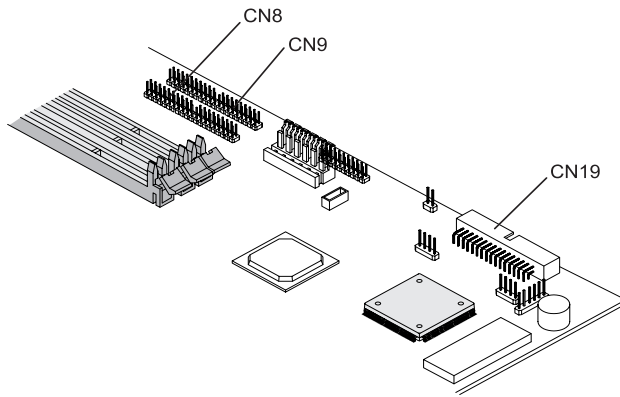


## Identifying signal cable connectors

When you install a drive of any type, you must attach the signal cable (also called the data cable) from the drive to a connector on the system board. The following table identifies each connector on the system board and the type of drive that uses the connection. Note that the first two connectors are for IDE/ATA PCI bus drives (such as hard disk drives and CD-ROM drives), while the third connector is for diskette interface drives (such as diskette drives or tape drives).

<b>System board connector</b>	<b>Interface type</b>	<b>Type of drive using the connector</b>
Primary IDE – <b>CN9</b>	IDE/ATA PCI bus	Preferred location for first and second hard disk drives. A CD-ROM drive can also be attached here.
Secondary IDE – <b>CN8</b>	IDE/ATA PCI bus	Preferred location for a CD-ROM drive. An additional hard disk drive could be attached here.
Diskette – <b>CN19</b>	Standard diskette	Should be used for diskette drives or tape drives.

Use the following illustration to identify the signal cable connectors on your system board:



When attaching a drive signal cable to any of these connectors, take note of the pin 1 indicator (usually marked by colored stripes or dots) on the cable to ensure that it matches the pin 1 on the connector.

## Guidelines for connecting IDE/ATA signal cables

Your system board has two connectors for attaching IDE/ATA signal cables, but you can install two IDE/ATA drives to each of these connectors if you have the proper cables. When two drives are attached to one connector, one drive must be the master device, and the other the slave device. Jumper settings on the drives determine which drive is the master and which is the slave.

The hard disk that came installed in your computer is attached to IDE connector 1 and is set as a master device. If your computer came with a CD-ROM drive, it is attached to IDE connector 2 and is set as a slave device.

These are the general guidelines for IDE/ATA signal cable connections:

- If only one drive is attached to a connector, it typically must be set as a master device.
- On each connector, there can be only one drive set as the master device and one drive set as the slave device.
- A maximum of four IDE drives can be attached to your computer, two on the primary IDE connector, and two on the secondary IDE connector.
- If a hard disk shares the same connector with a drive that requires a software device driver (such as a CD-ROM drive), the hard disk must be set as the master device.

If you are installing a drive to the **PRIMARY IDE** connector, follow these guidelines:

- Attach the signal cable from the drive to the primary IDE connector (**CN9**) on the system board. Refer to “Card connector and jumper information” on page 8-4.
- Set the newly installed drive as a master device if one of these conditions exists:
  - The new drive is the only drive attached to the connector.
  - Another drive that is not a hard disk drive (such as a CD-ROM) is already attached to the connector. Set the drive that is already attached to the connector as the slave device. Jumpers for setting CD-ROM drives as master or slave devices are typically located at the back of the drive.
- Set the newly installed hard disk as a slave device if another hard disk is already attached to the connector.

If you are installing a drive to the **SECONDARY IDE** connector, follow these guidelines:

- Attach the signal cable from the drive to the secondary IDE connector, which is labeled **CN8** on the system board. Refer to “Card connector and jumper information” on page 8-4.
- Set the newly installed drive as a master device if one of these conditions exists:
  - The new drive is the only drive attached to the connector.

— Another drive that is not a hard disk drive (such as a CD-ROM) is already attached to the connector. Set the drive that is already attached to the connector as the slave device. Jumpers for setting CD-ROM drives as master or slave devices are typically located at the back of the drive.

- Set the newly installed hard disk as a slave device if another hard disk is already attached to the connector.

## Guidelines for connecting diskette interface signal cables

Your system board has one connector for attaching diskette interface signal cables, but you can install two diskette interface drives to this connector if you have the proper cables.

If you are installing a second diskette drive or a tape drive, follow these guidelines:

- Attach the signal cable from the drive to the diskette drive connector labeled **FLOPPY (CN19)** on the system board.
- Do not change any settings on a diskette drive that is already installed.

When you have finished installing the diskette drive, enter Setup to make sure that the drive parameter setting is correct. See “Setup parameters” on page 5-7 for instructions.

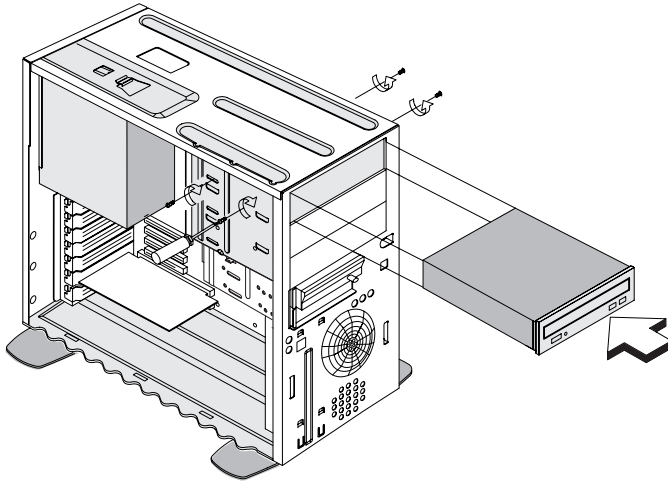
## Tips for proper drive alignment

Do the following to ensure that the drive is aligned properly in a bay:

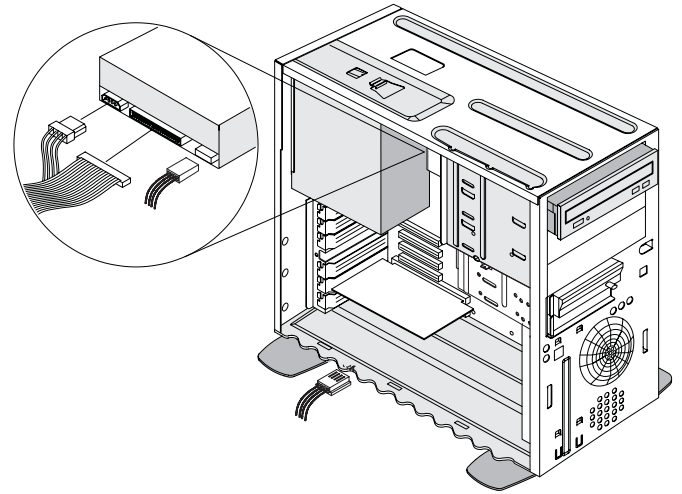
- 1.** Insert each screw and lightly tighten.
- 2.** After all the screws are properly set in their correct positions, tighten each screw securely.

# Installing a drive in bay 1, 2, or 3

- 1.** Insert the drive into the bay.
- 2.** Align the screw holes and secure the drive with four screws.

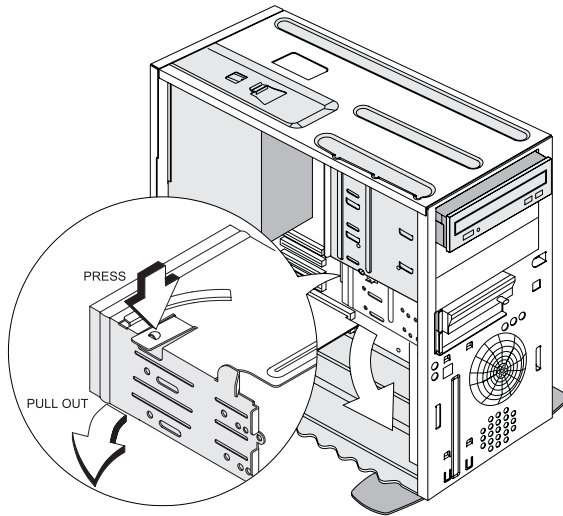


- 3.** Connect the power and signal cables to the drive.

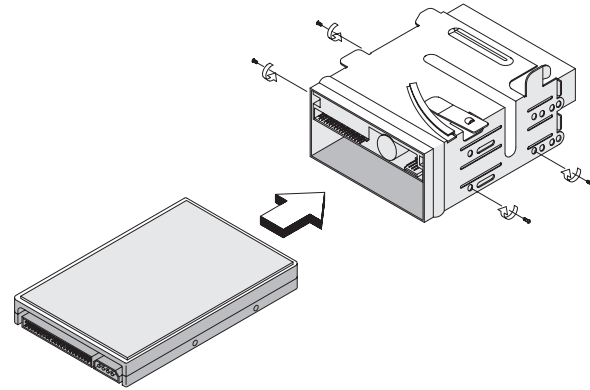


# Installing drives in bays 4 and 5

- 1.** Disconnect the power and signal cables that connect to the diskette drive.
- 2.** Remove the 3.5-inch drive frame from the housing by pressing the tab on top and swaying the frame outward.



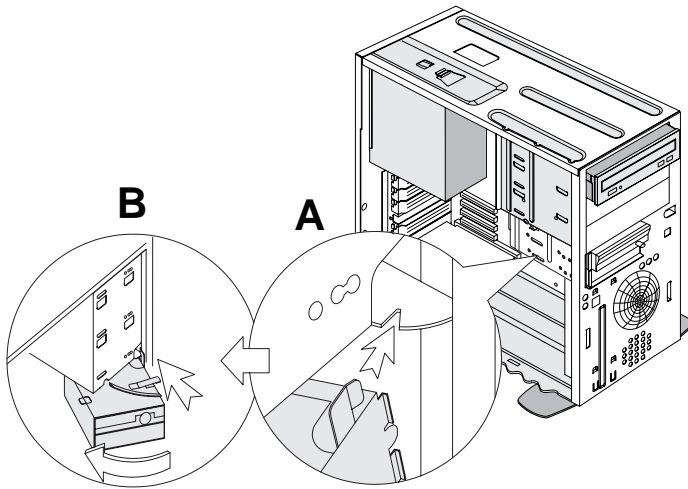
- 3.** From the back of the frame, carefully insert a 3.5-inch hard disk drive then secure it with four screws on the sides.



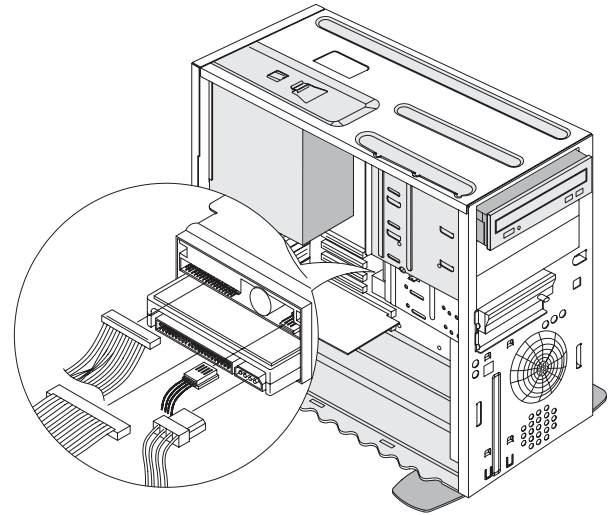


**4.** Insert the frame into the system unit as in the following figure.

- a.** Align the frame with the notch.
- b.** Pivot the frame toward the system unit until the tab clicks into place.



**5.** Connect the signal and power cables to the drives.



## Removing drives

To remove a drive from a specific bay, reverse the steps for installing a drive in that bay.

# Putting the system back together

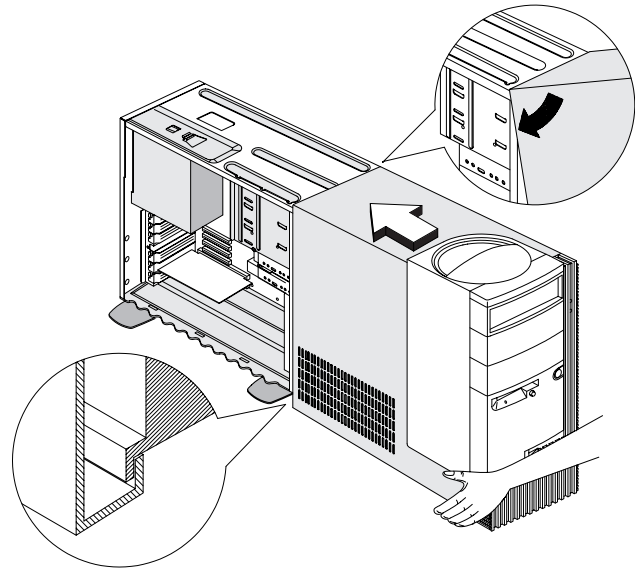
When you have completed your hardware installation, check the following before replacing the system unit cover:

- all internal cables are properly connected
- all adapter cards are securely installed
- all jumpers are correctly set

# Replacing the cover

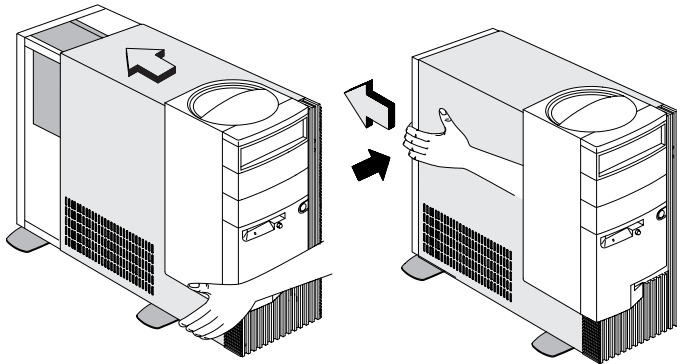
- 1.** Align the upper back corners of the cover with the upper front corners of the system unit. Tilt the front of the cover up about an inch.
- 2.** Align the lower back corners of the cover with the lower front corners of the system unit.

This ensures that the rails of the system unit slide along the grooves on the sides of the cover.



**3.** Slide the cover back until it fits in place.

If the cover does not slide all the way to the back, hold the upper back corners of the cover. Gently press them inward while pushing the cover toward the back of the system unit.



**4.** Turn the lock at the back of the unit toward the “locked” icon to secure the cover to the chassis.

## Reconnecting peripherals

After making sure that the cover is in place, reconnect all the peripherals. Refer to the *Setup poster* for instructions on cable connections.

# Updating the CMOS settings in Setup

When you add Plug and Play adapter cards and drives, your system's Basic Input/Output System (BIOS) detects the hardware changes and updates the CMOS settings automatically.

When you add devices that are not Plug and Play, you have to enter Setup to manually assign resources (IRQs) to the devices.

## For adapter cards

When you install a new adapter card, you can select the **Advanced Options** from the Setup main menu. From the Advanced Options menu, select **PCI Options** to view or change PCI adapter card information. See the section "PnP/PCI options" on page 5-17.

For other Plug and Play and non-Plug and Play adapter cards, go to the Windows 95 Device Manager for information.

## For drives

When you install a diskette drive, you should check the size and storage capacity of the drive and make any required changes in Setup. To specify the diskette drive size and capacity, select the **Disk Drives** option in the Setup main menu. See "Disk drives" on page 5-7 for information about this option.

If you remove a diskette, hard disk, or CD-ROM drive, the power-on self test generates an error message. In Setup, verify that the information the BIOS automatically recorded is correct. Use this opportunity to verify that the remaining drives are installed as intended.

Select the following options from the Setup main menu to verify drive settings:

- **System Information**

See "Viewing system information and product data" on page 5-5 for information about this option.

- **Disk Drives**

See "Disk drives" on page 5-7 for information about this option.

- **Startup Options**

See "Startup options" on page 5-12 for information about this option.

# Adding and replacing system board components **8**

To work with the hardware components on the system board, you must first unplug the system and remove the system unit cover. If you have not removed the cover from your system unit, see “Opening the system unit” on page 6-4.

To access the section of the system board that you need to work with, you might have to remove adapter cards and drives. With **the** system board exposed, you can work with the connectors, system memory modules, and the system battery.

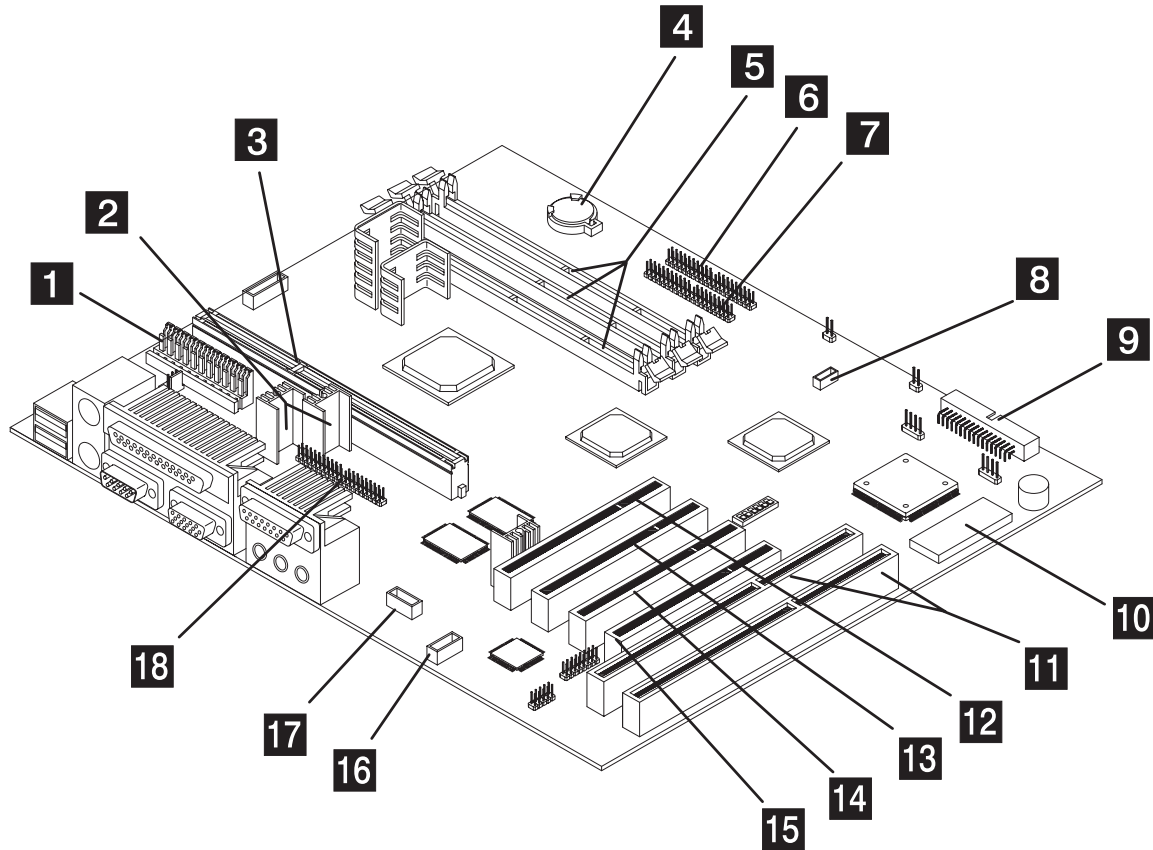
Once you have completed your hardware changes and put the cover back on your system unit, you might need to enter the BIOS Configuration/Setup Utility to update the settings. For information about whether this is a step you should take, see “Updating the CMOS settings in Setup” on page 8-7.

The following sections contain instructions for working with the hardware components on your system board:

- “Identifying the parts of the system board” on page 8-2
- “Card connector and jumper information” on page 8-4
- “Upgrading the system memory” on page 8-5
- “Replacing the system battery” on page 8-6
- “Updating the CMOS settings in Setup” on page 8-7

# Identifying the parts of the system board

If you plan to add or replace hardware in your computer, you need to know the layout of the system board. This figure shows an example of the system board in your computer. The items on the next page correspond to the numbered locations on the figure.



The system board, sometimes called the planar or motherboard, is the main circuit board in the system unit. It supports a variety of devices and provides other basic computer functions that are preinstalled or that you can install later. The system board shown on the preceding page has the following parts:

- 1 Power supply connector.** Holds the power cables from the power supply.
- 2 CPU voltage regulators.** Convert the system operating voltage to match the CPU voltage.
- 3 Pentium II CPU slot.** The processor is plugged into this socket.
- 4 Battery.** The system uses a 3V lithium battery (CR2032).
- 5 Memory module sockets (for DIMMs).** Your system board has three 168-pin sockets labeled DIMM1 to DIMM3 for Dual Inline Memory Modules (DIMMs). The DIMM sockets support 3.3V single- or double-sided Synchronous DRAM (SDRAM). The maximum system memory is 384 MB.
- 6 Primary IDE connector.** Holds signal cables that attach to IDE channel 1.
- 7 Secondary IDE connector.** Holds signal cables that attach to IDE channel 2.
- 8 Modem wakeup connector.** This connector holds the cable for the modem wakeup feature.
- 9 Diskette drive connector.** Holds the signal cable from the diskette drive.
- 10 Flash ROM BIOS.** A 256KB Flash ROM stores the system BIOS.
- 11 ISA adapter card connectors.** The system board includes two ISA adapter card connectors. Note that the connector labeled ISA1 is shared with the PCI connector labeled PCI4. You may not install an adapter card into the ISA1 connector unless the PCI4 connector is empty.
- 12 PCI adapter card connector (PCI1).** This is the first PCI adapter card connector.
- 13 PCI adapter card connector (PCI2).** This is the second PCI adapter card connector.
- 14 PCI adapter card connector (PCI3).** This is the third PCI adapter card connector.
- 15 PCI adapter card connector (PCI4).** This is the fourth PCI adapter card connector. Note that this PCI connector is shared with the connector labeled ISA1. You may not install an adapter card into the PCI4 connector unless the ISA1 connector is empty.
- 16 CD-ROM audio signal connector.** Connects the signal cable from the CD-ROM drive.
- 17 Fax/modem ring-in connector.** Holds the audio signal cable that connects to the modem card.
- 18 ATI Multimedia Channel (AMC) connector.** The AMC connector allows for direct attachment of external devices to the graphics controller. This direct connection facilitates transfer of video stream data from the controller to the device, and vice versa.

# Card connector and jumper information

## Identifying adapter card connectors

You can install ISA or PCI adapter cards into the card connectors on the system board. Use the following table to help you determine the type and length of adapter cards that you can install in the card connectors.

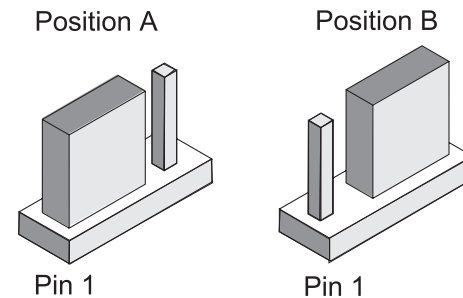
Adapter card connector	Type of adapter card you can install
<b>PCI1</b>	Can hold a half-length or full-length PCI adapter card.
<b>PCI2</b>	Can hold a half-length or full-length PCI adapter card.
<b>PCI3</b>	Can hold a half-length or full-length PCI adapter card.
<b>PCI4</b>	Can hold a half-length or full-length PCI adapter card (if ISA1 slot is empty).
<b>ISA1</b>	Can hold a half-length, three quarter-length, or full-length ISA adapter card (if PCI4 is empty).
<b>ISA2</b>	Can hold a half-length, three quarter-length, or full-length ISA adapter card.

Refer to the section “Adding and removing adapter cards” on page 7-3 for instructions on adding or removing cards.

## Setting a jumper

When you install an adapter card, you may have to set switches or move jumpers to make the card work properly. Plug and Play cards normally require no changes, but other cards do. Refer to the documentation that came with the new hardware to determine if changes to jumper or switch settings are required.

The following figures show how to set a jumper. Position A shows closing pins 1-2 while position B shows closing pins 2-3. Pin 1 of a jumper is usually marked by a solid white line beside the pin.

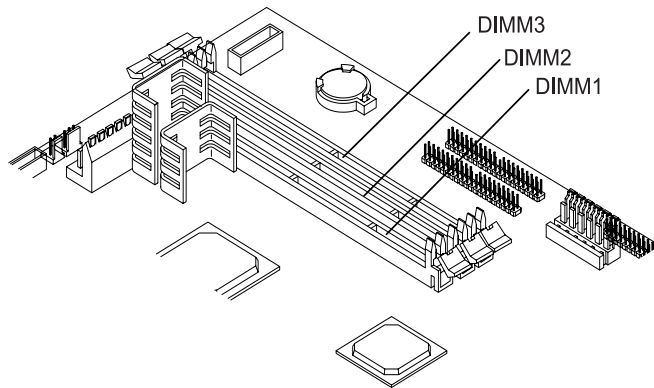




# Upgrading the system memory

Your system board has three system memory module sockets: DIMM1, DIMM2, and DIMM3. These sockets hold Dual Inline Memory Modules (DIMMs) that contain 3.3V single- or double-sided synchronous DRAM (SDRAM). You may install up to a maximum of 384 MB of system memory into these sockets. For possible memory address configurations, see the table “Memory map” on page A-1.

The following figure shows the location of the DIMM sockets on the system board.



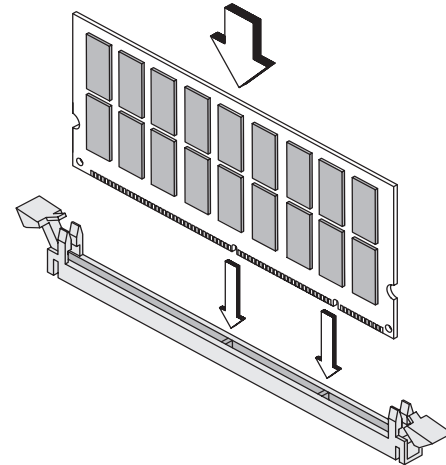
## Installing memory modules

To install a DIMM:

1. Open the clips on the socket.
2. Align the DIMM with the socket.
3. Press the DIMM into the socket until the clips lock into the DIMM.

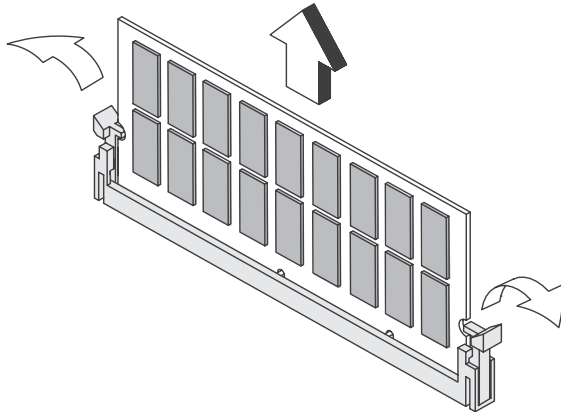
**Note:**

*The DIMM socket is slotted to ensure proper installation. If you insert a DIMM but it does not fit easily into the socket, you may have inserted it incorrectly. Turn the DIMM around and try to insert it again.*



# Removing memory modules

To remove a DIMM, press the holding clips on both sides of the socket outward to release the DIMM.



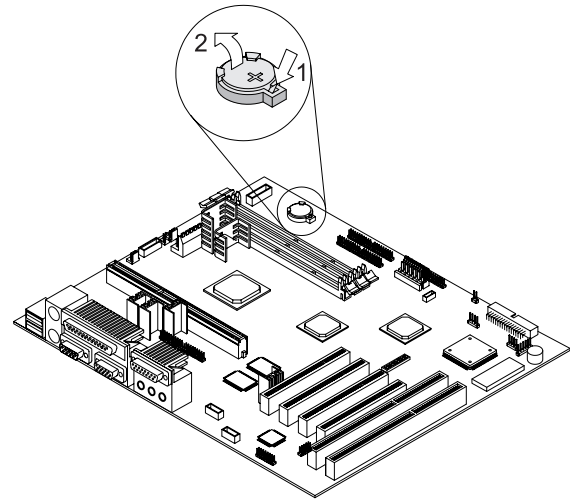
# Verifying the system memory

To view the system memory settings in Setup, select **System Information** from the Setup main menu. See the section “Viewing system information and product data” on page 5-5 for information about this option.

# Replacing the system battery

Follow these steps to replace the battery:

1. Press the securing clip on the battery socket to release the battery.
2. Lift the battery from the socket.



3. Insert a new 3V lithium battery (CR2032) into the socket and press it down until the securing clip clicks and locks the battery in.

**Important:**

*Make sure you insert the battery with the positive side on top. A plus (+) sign indicates the positive side.*

If you replace the system battery, you need to reset the system date and time in Setup.

Follow these steps:

- 1.** Enter Setup.
- 2.** From the Setup main menu, select **Date and Time**.
- 3.** Set the date and the time.
- 4.** Press **Esc** to exit Setup.
- 5.** Use the left arrow key to select **Yes**, the press **Enter** to save the settings in CMOS.

You may also change the time and date from the Windows 95 desktop.

- 1.** Double-click on the **My Computer** icon.
- 2.** Double-click on the **Control Panel** icon.
- 3.** From the Control Panel, double-click on the **Date/Time** icon to display the items for changing the date and time.
- 4.** Make the necessary changes then click on the **OK** button.

# Updating the CMOS settings in Setup

When you add system board components, such as system memory modules, your system's Basic Input/Output System (BIOS) detects the hardware changes and updates the CMOS settings automatically. However, if you replace or remove components, you might receive a message that asks you to verify if the automatic detection changed the configuration correctly.

To verify or correct the system configuration settings, enter Setup. See the section "Entering Setup" on page 5-3.



# Troubleshooting **Part 5**

This part contains information to help you respond to problems with the hardware, software, and features installed in your computer at the factory.

This part contains the following chapter:

- **“Chapter 9: Diagnosing and recovering from problems” on page 9-1**

This chapter provides troubleshooting information, including error code interpretations. It also includes information to help you recover factory-installed programs and files.

---



# Diagnosing and recovering from problems 9

This chapter can help you if your computer stops operating or displays error messages. It covers the following major topics:

- “Before you panic: some simple fixes” on page 9-2

This section lists some common problems that you might encounter while operating your computer.

- “Quick problem solving chart” on page 9-6

This flow chart will help you diagnose system problems that you may have with your computer.

- “Solving hardware and software problems” on page 9-7

The tables in this section list some common hardware and software problems. It includes corrective actions for each problem.

- “Error codes and messages” on page 9-16

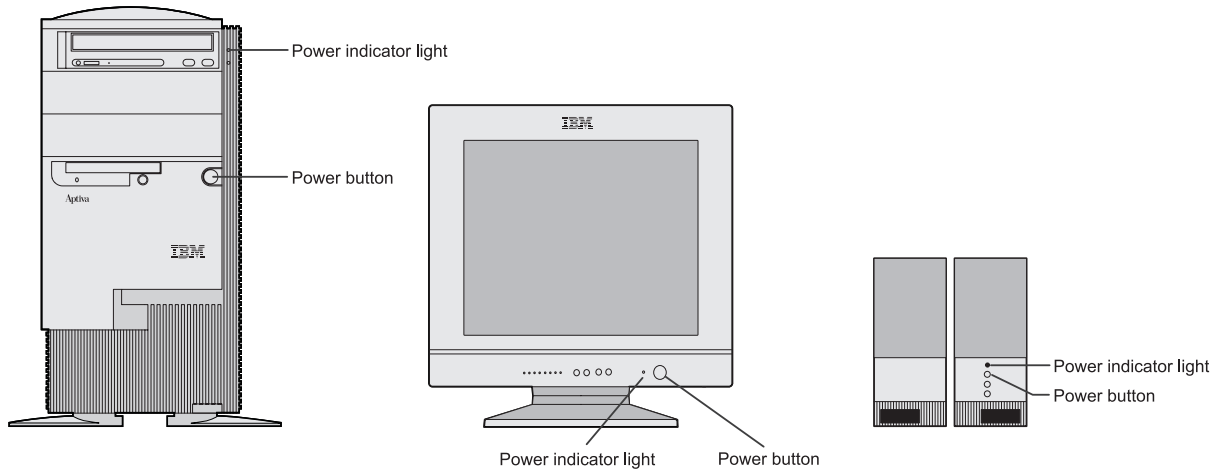
This section lists the BIOS error codes and messages and their respective corrective actions.

- “Recovering factory-installed programs and files” on page 9-23

This section tells you how to use the Aptiva Product Recovery CD if you lose the factory-installed programs in your computer.

# Before you panic: some simple fixes

## Step 1 Are the power indicator lights on the system unit, monitor, and speakers lit?



**Note:** The locations of the power indicator lights may be slightly different from those shown in these pictures.

Yes

Power is reaching the system unit and monitor. Go to Step 2.

No

- Press the power button on the system unit, monitor, and speaker to make sure they are turned on.
- Make sure your system unit, monitor, and speaker cables are correctly and securely connected. Make sure the system unit, monitor, and speaker power cords are plugged into electrical outlets. The *Setup poster* shows how the cables and cords should be connected.
- Make sure the electrical outlets you are using are not controlled by a wall or dimmer switch.
- If you are using a multiple outlet device (for example, a power surge protector or power strip), make sure it is plugged in and turned on.

If the problem continues, refer to the “Quick problem solving chart” on page 9-6.



## Step 2 Did the system unit beep after it was turned on?

**Yes**

There is a hardware problem. If you added hardware, remove it and restart the computer to see if the problem is corrected. If the problem is corrected, you may have installed your hardware incorrectly. Reinstall your hardware.

For instructions on installing hardware in the system unit, see “Working with the hardware in the system unit” on page 7-2. For instructions on installing options on your system board, see Chapter 8.

If the problem continues, refer to the “Quick problem solving chart” on page 9-6.

**Yes, more than once**

There is a problem with the system unit. Find the error code or message in the section “Error codes and messages” on page 9-16 and take the action listed.

### Step 3 Is anything displayed on the monitor?



Yes

There may be a problem with the system unit if:

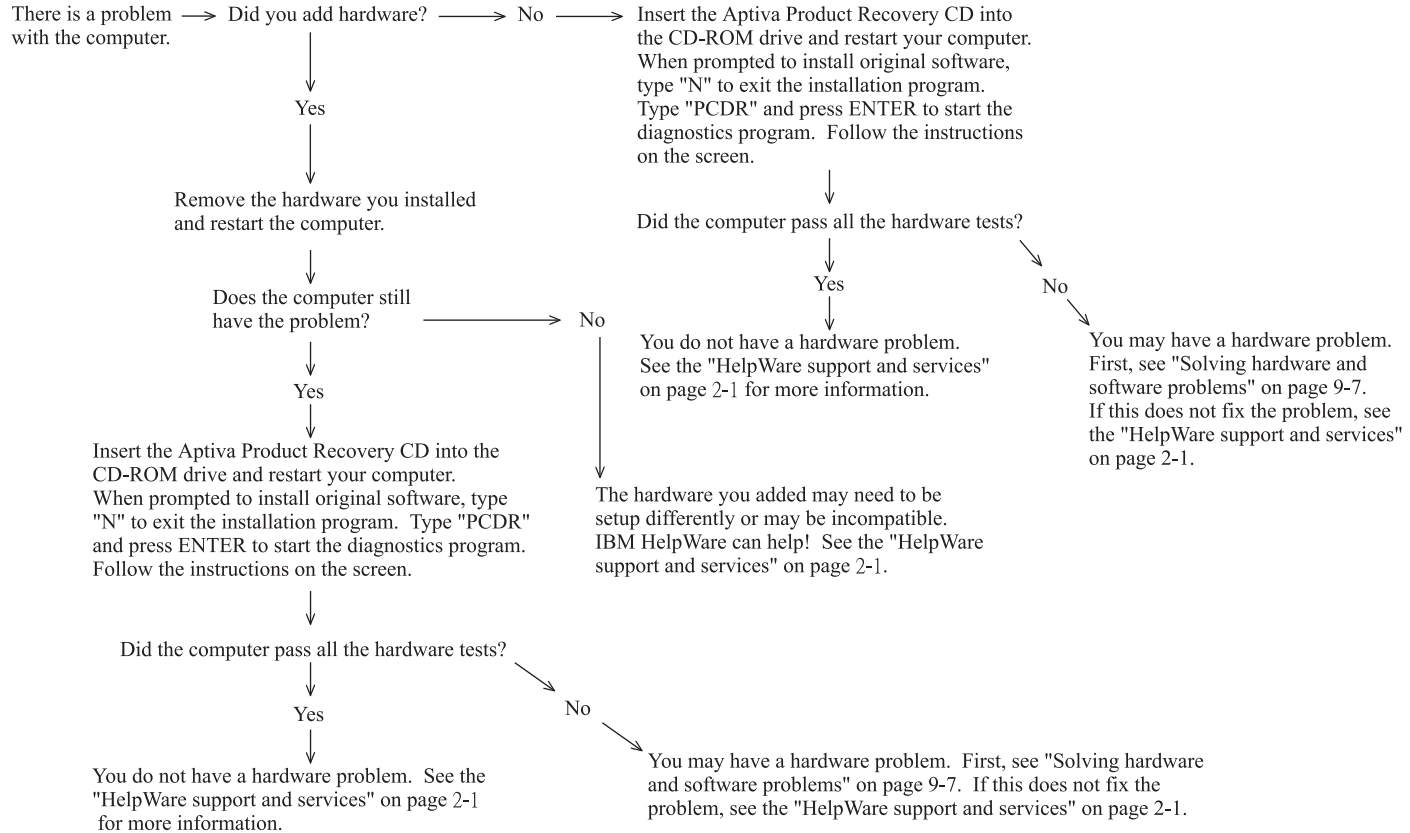
- An error message appears. Find the error message in the section “Error codes and messages” on page 9-16 and take the action listed.
- A box containing an error code and message appears. Follow the instructions in the message. For instructions on using Setup, see “Entering Setup” on page 5-3.
- The image on the screen is unreadable (the image is scrolling, blinking, or flashing). You may have selected a monitor setting that your monitor does not support. Follow these steps to reconfigure your monitor:
  - a. Restart the computer. If necessary, turn the system unit off, pause for 15 seconds, and then turn the system unit back on.
  - b. When you see “Starting Windows 95” appear on the screen during startup, press **F8**. This opens the Microsoft Windows 95 Startup Menu.
  - c. Select Choice 3 for Safe Mode and press **Enter**. This starts your computer using the factory configuration settings.
  - d. When your computer has completed startup, double-click on the **My Computer** desktop icon.
  - e. In the My Computer window, double-click on the **Control Panel** icon.
  - f. In the Control Panel window, double-click on the **Display** icon.
  - g. In the Display Properties window, click on the **Properties** tab.
  - h. See “Customizing display properties” on page 3-3 for instructions on selecting new monitor settings.
  - i. Restart the computer. Your computer may take a little longer than usual to restart.

*(Steps continued on the next page.)*

### Step 3 Is anything displayed on the monitor? (Continued)

	<ul style="list-style-type: none"><li>• The colors displayed are wrong. Make sure the monitor cable is correctly and securely connected to the system unit. Your <i>Setup Poster</i> shows how the cable should be connected. If the problem continues, refer to “Solving hardware and software problems” on page 9-7 and take the action listed.</li><li>• Nothing happens when you use the mouse or keyboard.<ul style="list-style-type: none"><li>a. Make sure the keyboard and mouse cables are correctly and securely connected to the ports on the back of the system unit.<p>The keyboard port has this symbol next to it: </p><p>The mouse port has this symbol next to it: </p></li><li>b. Turn the system unit off, and then turn it on again.</li></ul></li></ul> <p>If the problem continues, refer to the “Quick problem solving chart” on page 9-6.</p>
<p>No</p>	<ul style="list-style-type: none"><li>• There may be a problem with the monitor.<ul style="list-style-type: none"><li>a. Make sure your monitor cables are correctly and securely connected. Your <i>Setup Poster</i> shows how the cables should be connected.</li><li>b. Adjust the brightness and contrast controls. For more information, refer to the documentation that came with your monitor.</li></ul></li><li>• There may be a problem with the battery on your system board. See “Replacing the system battery” on page 8-6 for instructions on how to replace the battery.</li></ul> <p>If the problem continues, refer to the “Quick problem solving chart” on page 9-6.</p>


# Quick problem solving chart



# Solving hardware and software problems

## Solving hardware problems


**Table 1: Hardware problems**

<b>If the problem is:</b>	<b>Here's what to do:</b>
Screen is black (no error code); beep during power on self-test (POST).	If you installed memory modules or adapter cards, make sure you installed them correctly. For instructions on installing memory modules on your system board, see "Installing memory modules" on page 8-5. For instructions on installing adapter cards in your system unit, see "Adding and removing adapter cards" on page 7-3.
Error code (and description), more than one beep in self-test, or continuous beep occurs	If an error code or message appears, refer to the section "Error codes and messages" on page 9-16.
Computer turns off without warning	<ol style="list-style-type: none"><li>1. If you have enabled the Standby feature, move the mouse to exit Standby.</li><li>2. Make sure that the system unit and monitor power cords are securely plugged into electrical outlets.</li><li>3. Make sure that the cables are correctly and securely connected to the system unit.</li><li>4. Check for a blown fuse, tripped circuit breaker, or power failure.</li><li>5. Unplug the system unit power cord from the electrical outlet, wait 10 seconds, and then plug the power cord back into the electrical outlet. If the computer does not start immediately, push the power button on the system unit.</li><li>6. If you have added hardware inside the system unit, make sure the power cable connectors are securely attached.</li></ol>
Can't enter password	<ol style="list-style-type: none"><li>1. Make sure you are typing the correct password.</li><li>2. Make sure the keyboard cable is correctly and securely connected to the keyboard port (not the mouse port) on the back of the system unit.</li></ol> <p>The keyboard port has this symbol next to it:  .</p>
<b>Note:</b> If any of these problems continue after taking the actions listed, see "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.	


**Table 1: Hardware problems (Continued)**

<b>If the problem is:</b>	<b>Here's what to do:</b>
Can't read information on diskette or CD	<ol style="list-style-type: none"><li>1. Make sure you are using the correct type of diskette. Make sure the diskette is formatted correctly.</li><li>2. Make sure the diskette or CD is inserted into the drive correctly.</li><li>3. Make sure the CD is clean and not scratched.</li><li>4. Try to read a diskette or CD that you know is good. If it works, the first diskette or CD is damaged. If you can't read the information on the good diskette or CD, there may be a problem with your diskette or CD-ROM drive.</li><li>5. Make sure the drive power and signal cables are securely attached to the back of the drive. For instructions on working in the system unit, see "Working with the hardware in the system unit" on page 7-2.</li></ol>
Audio CD does not play when inserted into CD-ROM drive	<p>Make sure you have enabled AutoPlay. To enable AutoPlay:</p> <ol style="list-style-type: none"><li>1. Click on <b>Start</b>.</li><li>2. Select <b>Settings</b> and click on <b>Control Panel</b>.</li><li>3. Double click on the <b>System</b> icon.</li><li>4. Click on the <b>Device Manager</b> tab.</li><li>5. Double click on <b>CD-ROM</b> and select the listed CD-ROM option.</li><li>6. Click on the <b>Settings</b> tab.</li><li>7. Under <b>Options</b>, click on <b>Auto insert notification</b> (a check appears in the box).</li><li>8. Click on <b>OK</b>.</li></ol>
Can't write to diskette	<ol style="list-style-type: none"><li>1. Make sure you are using the correct type of diskette. Make sure that the diskette is correctly formatted.</li><li>2. Make sure the diskette is not write-protected.</li><li>3. Make sure you are sending information to the correct drive.</li><li>4. Make sure there is space on the diskette for the information. (Try using a blank, formatted diskette.)</li><li>5. Make sure the drive power and signal cables are securely attached to the back of the drive. For instructions on working in the system unit, see "Working with the hardware in the system unit" on page 7-2.</li><li>6. Make sure that the Diskette Drive parameter is enabled in Setup under Advanced Options, Security Options.</li></ol>
<b>Note:</b> If any of these problems continue after taking the actions listed, see "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.	

**Table 1: Hardware problems (Continued)**

<b>If the problem is:</b>	<b>Here's what to do:</b>
Can't format diskette	<ol style="list-style-type: none"><li>1. Make sure the diskette is not write-protected.</li><li>2. Make sure you are using the correct type of diskette.</li><li>3. Make sure the drive power and signal cables are securely attached to the back of the drive. For instructions on working in the system unit, see "Working with the hardware in the system unit" on page 7-2.</li><li>4. Make sure Diskette Drive is enabled in Setup under Advanced Options, Security Options.</li></ol>
Keyboard doesn't work or only some keys work	<ol style="list-style-type: none"><li>1. Make sure the keyboard cable is correctly and securely connected to the keyboard port (not the mouse port) on the back of the system unit.  The keyboard port has this symbol next to it to help you: </li><li>2. Move your fingers across the keys. Make sure no keys are stuck.</li><li>3. Make sure you are using a screen that allows typing. Some screens do not.</li><li>4. Turn the system unit off, wait 10 seconds, and then turn the system unit on again.</li></ol>
<b>Note:</b> If any of these problems continue after taking the actions listed, see "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.	

**Table 1: Hardware problems (Continued)**


<b>If the problem is:</b>	<b>Here's what to do:</b>
Mouse does not work	<ol style="list-style-type: none"><li>1. Move the mouse onto a mouse pad and try using it.</li><li>2. Make sure you are using a screen that allows the use of a mouse. Some screens do not.</li><li>3. Make sure the mouse cable is correctly and securely connected to the mouse port (not the keyboard port) on the back of the system unit.  The mouse port has this symbol next to it to help you: </li><li>4. Clean the mouse.<ol style="list-style-type: none"><li>a. Turn the computer off.</li><li>b. Disconnect the mouse cable from the system unit.</li><li>c. Turn the mouse upside down. Unlock the retainer on the bottom of the mouse by turning it counterclockwise. Now turn the mouse right-side up, and the retainer and the ball will drop out.</li><li>d. Using a damp cloth, wipe the outside of the mouse and the retainer. Be sure to wipe the rollers inside the mouse.</li><li>e. Insert the ball and retainer. Lock the retainer by turning it clockwise.</li><li>f. Reconnect the mouse cable to the system unit.</li><li>g. Turn on the computer.</li></ol></li><li>5. Turn the system unit off, wait 10 seconds, and then turn the system unit on again.</li></ol>
<p><b>Note:</b> If any of these problems continue after taking the actions listed, see “Chapter 2: HelpWare support and services” on page 2-1 for information on obtaining service.</p>	



**Table 1: Hardware problems (Continued)**

<b>If the problem is:</b>	<b>Here's what to do:</b>
Modem/communications errors	<ol style="list-style-type: none"><li>1. Make sure the telephone cord is securely connected. Your <i>Setup Poster</i> shows how the cord should be connected.</li><li>2. Make sure the telephone line works by plugging a working telephone into the same telephone outlet that the computer was plugged into. Then make sure you can place a call.</li><li>3. Make sure your modem cord is connected to an analog telephone line. For additional help, see "Setting up communications" on page 3-9.</li><li>4. Make sure you are calling the correct number, and that you are using the correct communications settings. For additional help, see the user's guide for your communications software.</li><li>5. Make sure no one is using the telephone while you are communicating with another computer.</li><li>6. If some communications programs work but others do not, there may be a configuration problem. For additional help, see the user's guide for your communications software.</li><li>7. Make sure the modem adapter card is installed correctly. For instructions on installing adapter cards in the system unit, see "Adding and removing adapter cards" on page 7-3.</li></ol>
When the computer is turned on, the message "Insert a system diskette and press Enter to reboot" appears	<ol style="list-style-type: none"><li>1. Choose Startup Options from the Setup main menu, and make sure that Startup devices are set correctly.</li><li>2. Make sure the drive power and signal cables are securely attached to the back of the hard disk drive. For instructions on working in the system unit, see "Adding and removing drives" on page 7-5.</li><li>3. Insert the Aptiva <i>Product Recovery CD-ROM</i> into the CD-ROM drive, and restart the computer. Follow the instructions on your screen to restore the operating system files to your computer's hard disk.</li></ol>
<b>Note:</b> If any of these problems continue after taking the actions listed, see "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.	

**Table 1: Hardware problems (Continued)**

<b>If the problem is:</b>	<b>Here's what to do:</b>
Printer error	<ol style="list-style-type: none"><li>1. Make sure the printer is turned on.</li><li>2. Make sure the printer cable is correctly and securely connected to the printer and to the parallel (printer) port on the back of the system unit.  The printer port has this symbol next to it to help you: </li><li>3. Make sure the printer power cord is securely connected to an electrical outlet.</li><li>4. Make sure the printer is ready for printing. (If the Ready light is on, but not flashing, the printer is ready.)</li><li>5. Make sure the correct printer driver is selected in the software, if required. For instructions on selecting a printer driver, see "Getting ready to print" on page 3-8.</li><li>6. Make sure the paper and the cartridge containing the print material (ink, ribbon, or toner) are loaded correctly.</li><li>7. Turn the printer and system unit off, and wait 10 seconds. Now turn the printer on, and then the system unit.</li><li>8. Make sure the Parallel Port option is not set to Disabled in the Devices and I/O Ports menu in Setup.</li><li>9. Make sure the parallel port Operation Mode parameter is set to a mode that matches your printer.</li><li>10. For additional help, see the user's guide that came with the printer.</li></ol>
<p><b>Note:</b> If any of these problems continue after taking the actions listed, see "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.</p>	

# Solving software problems

**Table 2: Software problems**

<b>If the problem is:</b>	<b>Here's what to do:</b>
<p>Computer doesn't go into standby or automatically power off when the set time has elapsed.</p>	<ol style="list-style-type: none"><li>1. Make sure you don't touch the mouse or keyboard, and don't start a program that involves using the hard disk, such as File Manager or a Windows 95 screen saver. These activities make the timer start over.</li><li>2. Make sure AutoPlay is disabled. When AutoPlay is enabled, the system detects activity in the CD-ROM drive and keeps the computer from going into Standby.</li><li>3. If the computer does not automatically turn off, make sure the Power Management mode is enabled, then check the set time parameter. For instructions on using Setup, see "Entering Setup" on page 5-3.</li><li>4. Allow a few minutes more than the specified time. Windows 95 periodically accesses the hard disk for memory swapping and this activity resets the Standby timer. Windows 95 might access the hard disk for a short time after you last touched your computer.</li><li>5. Close any open communications programs. Programs which are running may not allow the system to enter standby.</li></ol>
<p>When the parameter Power Switch &lt; 4 sec. under the Setup Power Management menu is set to Power Off, and the system does not turn off when you press the power button.</p>	<p>See "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.</p>
<p>When the parameter Power Switch &lt; 4 sec. under the Setup Power Management menu is set to Suspend, and the system does not turn off when you press the power button for more than four seconds.</p>	<p>See "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.</p>

**Note:** If any of these problems continue after taking the actions listed, see "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.

# Solving modem problems

Your modem is designed to provide reliable and trouble-free services. However, should you experience any difficulty, the information in this section will help you determine and resolve the source of the problem. If you can not resolve the problem after taking the troubleshooting tips here, contact your IBM PC HelpCenter for assistance. See the section “How and when do I contact the IBM PC HelpCenter?” on page 2-5.

**Table 3: Modem problems**

<b>If the problem is:</b>	<b>Here's what to do:</b>
Modem does not respond to commands	<ol style="list-style-type: none"><li>1. Make sure that the modem is not configured with a conflicting COM port and IRQ setting.</li><li>2. Make sure that the communications software is configured with the correct COM and IRQ settings (same COM port and IRQ line as the modem). Your communications software will not be able to send and receive from your modem any data if it does not have the correct COM and IRQ settings of the modem.</li><li>3. Make sure that the modem is properly initialized by the communications software. The modem can be improperly initialized by the software if you have selected the incorrect modem type. Select “Hayes Compatible” modem type and “Lucent” in your data communications software. Select “Generic class 1” and “Lucent” in your fax and voice software, respectively. You may also be prompted to enter an initialization string by the software. Use AT&amp;F as your initialization string.</li></ol>
Modem dials but does not connect	<ol style="list-style-type: none"><li>1. Make sure that the phone line is working properly. A noisy line will prevent proper modem operation.</li><li>2. Check for busy signal, ringback, or a remote answering system.</li></ol>
Modem makes a connection but no data appears on the screen	<ol style="list-style-type: none"><li>1. Make sure that all communication parameters (baud rate, data, stop, and parity bits) are properly configured and identical on both sides. Also make sure that the hardware control flow (RTS/CTS) is enabled in both the modem and the communications software.</li><li>2. Press the Enter key several times. The remote system may be waiting to receive your data before it begins.</li><li>3. Make sure that the correct terminal emulation mode is being used in the software. Refer to the manual that came with the software.</li></ol>

**Note:** If any of these problems continue after taking the actions listed, see “Chapter 2: HelpWare support and services” on page 2-1 for information on obtaining service.

**Table 3: Modem problems (Continued)**

<b>If the problem is:</b>	<b>Here's what to do:</b>
Make sure that the correct terminal emulation mode is being used in the software. Refer to the manual that came with the software.	<ol style="list-style-type: none"><li>1. Make sure that the Call Waiting feature is turned off.</li><li>2. Make sure that the RTS/CTS hardware flow control is enabled (do not use XON/XOFF software flow control).</li><li>3. Make sure that the data speed is not faster than your computer's capability.</li></ol>
Make sure that the data speed is not faster than your computer's capability.	<ol style="list-style-type: none"><li>1. Make sure that the correct modem type is selected in the voice/fax software. Use "Lucent" or "Hayes Compatible". Do not select "Cirrus Logic" or "Rockwell".</li><li>2. Make sure that your computer is fast enough to handle voice operations (at least 38.4Kbps DTE speed). Voice operations are processor intensive and require a Pentium 100MHz or faster processor when running under Windows95.</li></ol>

**Note:** If any of these problems continue after taking the actions listed, see "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.

# Error codes and messages

When you see error codes and messages on your screen, find the error code or message in the following table, then take the applicable corrective action or actions.

**Table 4: Error codes and messages**

<b>Error codes</b>	<b>Error messages</b>	<b>Corrective actions</b>
06	Equipment Configuration Error	<ol style="list-style-type: none"><li>1. This message appears together with other specific error messages indicating the device with error. First, find the device error message in this table and do the corresponding action.</li><li>2. Enter Setup and change the required settings.</li></ol>
10	Memory Error at MMMM:SSSS:OOOOh (R:xxxh, W:xxxh)	<ol style="list-style-type: none"><li>1. Make sure the DIMMs are properly installed, then reboot the system.</li><li>2. If you still receive the error message after doing option 1, the DIMMs may be defective. Change the DIMMs.</li></ol>
20	PS/2 Keyboard Interface Error	<ol style="list-style-type: none"><li>1. Plug in the keyboard properly and reboot the system.</li><li>2. If the error still shows after doing option 1, change your keyboard. It may be defective.</li></ol>
21	PS/2 Keyboard Error or Keyboard Not Connected	<ol style="list-style-type: none"><li>1. Plug in the keyboard properly and reboot the system.</li><li>2. If the error still shows after doing option 1, change your keyboard. It may be defective.</li></ol>
30	PS/2 Pointing Device Error	<ol style="list-style-type: none"><li>1. Make sure that the mouse is plugged in the PS/2 mouse port, then reboot the system.</li><li>2. If the error still shows after doing option 1, replace the PS/2 mouse. It may be defective.</li></ol>
31	PS/2 Pointing Device Interface Error	<ol style="list-style-type: none"><li>1. Make sure that the mouse is plugged in the PS/2 mouse port, then reboot the system.</li><li>2. If the error still shows after doing option 1, replace the PS/2 mouse. It may be defective.</li></ol>

**Note:** If any of the errors persist after performing the listed corrective actions, see “Chapter 2: HelpWare support and services” on page 2-1 for information on obtaining service.

**Table 4: Error codes and messages (Continued)**

<b>Error codes</b>	<b>Error messages</b>	<b>Corrective actions</b>
40	Floppy Disk Controller Error	Load the Setup default settings in Setup.
41	Floppy Drive A Error	<ol style="list-style-type: none"><li>1. Make sure that the Diskette Drive A parameter setting is correct.</li><li>2. Make sure the diskette drive signal cable is properly connected to the drive and to the system board.</li><li>3. Make sure the drive power cable is properly plugged in.</li><li>4. If the error persists after doing steps 1 to 3, replace diskette drive A. It may be defective.</li></ol>
48	Floppy Drive(s) Write Protected	<ol style="list-style-type: none"><li>1. Make sure the diskette protection tab is set correctly.</li><li>2. Enter Setup. Select <b>Advanced Options</b> then <b>Security Options</b>.</li><li>3. Make sure that the Diskette Drive parameter is set to Normal.</li></ol>
50	IDE Primary Channel Master Drive Error	<ol style="list-style-type: none"><li>1. Make sure the hard disk signal cable is properly connected to the drive and to the system board.</li><li>2. Make sure the drive power cable is properly connected.</li><li>3. Enter Setup and make sure that the IDE 1st Channel Master parameter is set to Auto.</li><li>4. If the error still appears after performing the above steps, replace the hard disk drive. It may be defective.</li></ol>
51	IDE Primary Channel Slave Drive Error	<ol style="list-style-type: none"><li>1. Make sure the hard disk signal cable is properly connected to the drive and to the system board.</li><li>2. Make sure the drive power cable is properly connected.</li><li>3. Enter Setup and make sure that the IDE 1st Channel Slave parameter is set to Auto.</li><li>4. If the error still appears after performing the above steps, replace the hard disk drive. It may be defective.</li></ol>

**Note:** If any of the errors persist after performing the listed corrective actions, see “Chapter 2: HelpWare support and services” on page 2-1 for information on obtaining service.

**Table 4: Error codes and messages (Continued)**

<b>Error codes</b>	<b>Error messages</b>	<b>Corrective actions</b>
52	IDE Secondary Channel Master Drive Error	<ol style="list-style-type: none"><li>1. Make sure the hard disk signal cable is properly connected to the drive and to the system board.</li><li>2. Make sure the drive power cable is properly connected.</li><li>3. Enter Setup and make sure that the IDE 2nd Channel Master parameter is set to Auto.</li><li>4. If the error still appears after performing the above steps, replace the hard disk drive. It may be defective.</li></ol>
53	IDE Secondary Channel Slave Drive Error	<ol style="list-style-type: none"><li>1. Make sure the hard disk signal cable is properly connected to the drive and to the system board.</li><li>2. Make sure the drive power cable is properly connected.</li><li>3. Enter Setup and make sure that the IDE 2nd Channel Slave parameter is set to Auto.</li><li>4. If the error still appears after performing the above steps, replace the hard disk drive. It may be defective.</li></ol>
55	Hard Disk Drive(s) Write Protected	Make sure that the Hard Disk Drive parameter under the Setup Security menu is set to Normal.
61	CPU Clock Mismatch	Load the default settings in Setup.
70	Real Time Clock Error	<ol style="list-style-type: none"><li>1. Reset the Date and Time parameters in Setup, then reboot the system.</li><li>2. If the error persists, replace the system battery. See the section "Replacing the system battery" on page 8-6.</li><li>3. Load the Setup default settings after replacing the battery.</li></ol>
71	CMOS Battery Bad	<ol style="list-style-type: none"><li>1. Replace the system battery. See the section "Replacing the system battery" on page 8-6.</li><li>2. Load the Setup default settings after replacing the battery.</li></ol>

**Note:** If any of the errors persist after performing the listed corrective actions, see "Chapter 2: HelpWare support and services" on page 2-1 for information on obtaining service.



**Table 4: Error codes and messages (Continued)**

<b>Error codes</b>	<b>Error messages</b>	<b>Corrective actions</b>
72	CMOS Checksum Error	Load the Setup default settings and reboot the system.
102	I/O Parity Error	Load the Setup defaults and reboot the system.
103	Press <Esc> to turn off NMI or other key to reboot	<ol style="list-style-type: none"><li>1. Press <b>Esc</b> to turn off Non-Maskable Interrupt (NMI) and proceed to boot the system.</li><li>2. Press any other key to reboot the system.</li></ol>
104	Insert system diskette and press <Enter> to reboot	<ol style="list-style-type: none"><li>1. Insert a system diskette into drive A and press <b>Enter</b> to reboot the system.</li><li>2. If the system works when you boot from drive A, your hard disk may have a problem.</li><li>3. Make sure that your hard disk drive is properly installed. Check all cable connections.</li></ol>
120	I/O Resource Conflict(s)	Enter Setup and set the Reset Resource Assignments to Yes, then reboot the system.
121	Memory Resource Conflict(s)	Enter Setup and set the Reset Resource Assignments to Yes, then reboot the system.
122	IRQ Setting Error	<ol style="list-style-type: none"><li>1. Enter Setup and set the Reset Resource Assignments to Yes, then reboot the system.</li><li>2. If the error message reappears, determine which onboard device is least necessary and disable it under the Devices and I/O Ports menu in Setup.</li></ol>
123	Expansion ROM Allocation Failed	Enter Setup and set the Reset Resource Assignments to Yes, then reboot the system.

**Note:** If any of the errors persist after performing the listed corrective actions, see “Chapter 2: HelpWare support and services” on page 2-1 for information on obtaining service.

**Table 4: Error codes and messages (Continued)**

<b>Error codes</b>	<b>Error messages</b>	<b>Corrective actions</b>
180	Onboard Serial Port IRQ Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to see if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, replace the cards.</li></ol>
182	Onboard Parallel Port IRQ Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to see if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, replace the cards.</li></ol>
183	Onboard Diskette Drive IRQ Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to check if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, replace the cards.</li></ol>
184	Onboard Pointing Device IRQ Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to check if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, replace the cards.</li></ol>
185	Onboard IDE Secondary Channel IRQ Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to see if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, enter Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system.</li><li>5. If the problem persists, set the Onboard IDE Secondary Channel parameter to Disabled, then reboot the system.</li></ol>

**Note:** If any of the errors persist after performing the listed corrective actions, see “Chapter 2: HelpWare support and services” on page 2-1 for information on obtaining service.

**Table 4: Error codes and messages (Continued)**

<b>Error codes</b>	<b>Error messages</b>	<b>Corrective actions</b>
186	Onboard ECP Parallel Port DMA Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to see if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, replace the cards.</li></ol>
187	Onboard Floppy Drive DMA Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to see if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, replace the cards.</li></ol>
188	Onboard Floppy Drive I/O Address Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to see if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, replace the cards.</li></ol>
189	Onboard IDE Secondary Channel I/O Address Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to see if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, enter Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system.</li><li>5. If the problem persists, set the Onboard IDE Secondary Channel parameter to Disabled, then reboot the system.</li></ol>
190	Onboard Serial Port I/O Address Conflict(s)	<ol style="list-style-type: none"><li>1. Enter Setup and change the onboard serial port I/O address or disable it.</li><li>2. Reboot the system.</li></ol>
192	Onboard Parallel Port I/O Address Conflict(s)	<ol style="list-style-type: none"><li>1. Enter Setup and change the onboard serial port I/O address or disable it.</li><li>2. Reboot the system.</li></ol>

**Note:** If any of the errors persist after performing the listed corrective actions, see “Chapter 2: HelpWare support and services” on page 2-1 for information on obtaining service.

**Table 4: Error codes and messages (Continued)**

<b>Error codes</b>	<b>Error messages</b>	<b>Corrective actions</b>
193	Onboard Serial Port Conflict(s)	Enter Setup and change the onboard serial port I/O address or change the add-on card serial port I/O address, then reboot the system.
195	Onboard Parallel Port Conflict(s)	Enter Setup and change the onboard parallel port I/O address or change the add-on card parallel port I/O address, then reboot the system.
196	Onboard IDE Primary Channel IRQ Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to see if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, enter Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system.</li><li>5. If the problem persists, set the Onboard IDE Primary Channel parameter to Disabled, then reboot the system.</li></ol>
197	Onboard IDE Primary Channel I/O Conflict(s)	<ol style="list-style-type: none"><li>1. Remove all the add-on cards in the system.</li><li>2. Power on the system to see if it works without the cards.</li><li>3. Re-install the cards one by one to determine which of the cards caused the error.</li><li>4. After determining the defective card or cards, enter Setup and set the Reset Resource Assignments parameter to Yes, then reboot the system.</li><li>5. If the problem persists, set the Onboard IDE Primary Channel parameter to Disabled, then reboot the system.</li></ol>
198	PnP ISA Card(s) Disabled	<ol style="list-style-type: none"><li>1. Enter Setup and set the Reset Resource Assignments to Yes, then reboot the system.</li><li>2. If the error message reappears, determine which onboard device is least necessary and disable it under the Devices and I/O Ports menu in Setup.</li></ol>

**Note:** If any of the errors persist after performing the listed corrective actions, see “Chapter 2: HelpWare support and services” on page 2-1 for information on obtaining service.

# Recovering factory-installed programs and files

Your Aptiva comes with preinstalled system and program files. If you accidentally erase any of these files, or if some of these files become corrupted when you install a new program, you can recover them. To recover lost or corrupted files that were installed at the factory, you need the Aptiva *Product Recovery CD-ROM* that came with your computer.

The preinstalled software is licensed, not sold. The licenses to preinstalled software allow you to make a backup copy to prevent accidental loss or destruction of the software.

To protect your personal data and any special system configuration, you should make regular backups of your data and configuration files. You will need these backup copies if you ever need to recover your system. In some cases, the recovery process formats the hard drive, erasing all the files there, and then installs new copies of the system and program files on the clean drive.

It's a good idea to duplicate the directory structure that is on your hard drive when you make backup copies of files. Otherwise, you need to keep notes about where your files belong on the hard drive. If you ever have to recover your system, you will need to copy your personal data and configuration files back to their original hard drive location.

To recover the factory installed system and program files, follow these steps:

1. Make sure your computer is turned on.

2. Put the Aptiva *Product Recovery CD-ROM* into your CD-ROM drive.
3. Turn off your computer.
4. Wait for 30 seconds.
5. Turn on your monitor and computer.
6. Follow the instructions on the screen.
7. After the Aptiva software has been reinstalled, copy your personal configuration and data files back into their original directories on the hard drive.

**Note:**

*If you have entered Setup and selected a hard disk to boot before your CD-ROM drive as your startup device, you might not be able to use the Aptiva Product Recovery CD to recover lost files.*

*Refer to the section "Boot from CD-ROM" on page 5-14.*



# Technical reference **Part 6**

This part contains technical information you might need if you upgrade your computer's hardware. It contains the following appendices:

- **“Appendix A: Specification tables” on page A-1**

This appendix contains specific memory, address, interrupt, channel, and port specifications. It also includes a list of the system board connectors and their corresponding functions.

- **“Appendix B: Modem information” on page B-1**

This appendix contains descriptive information about modems, including AT command set information you can use if you decide to operate your modem from a DOS command line.

- **“Appendix C: Monitor terminology” on page C-1**

This appendix contains definitions of some of the terms generally used to describe monitor characteristics.

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## Memory map

This table shows the hexadecimal addresses for the system memory regions. You may use this information for adapter cards that require you to set up memory regions.

**Table 5: Memory map**

<b>Address range</b>	<b>Description</b>
0~512 KB (000000 ~ 07FFFF)	Base memory
512~640 KB (080000 ~ 09FFFF)	Host/PCI memory
640~768 KB (0A0000 ~ 0BFFFF)	PCI/ISA Video buffer memory
768~800 KB (0C0000 ~ 0C7FFF)	Video BIOS memory
800~896 KB (0C80000 ~ 0DFFFF)	ISA adapter BIOS and buffer memory
896~960 KB (0E0000 ~ 0EFFFF)	BIOS extension memory Setup and POST memory PCI development BIOS
960~1024 KB (0E0000 ~ 0EFFFF)	System BIOS memory
100000 KB ~ Upper Limit	Main memory
Upper Limit ~ 4 GB	PCI memory

# System input/output addresses

This table shows the hexadecimal addresses for each of the system board Input/Output (I/O) functions. You may want to use this information if you install an adapter card that requires you to set I/O addresses.

**Table 6: System input/output addresses**

<b>Address range (hexadecimal)</b>	<b>Function</b>
0000-001F	DMA controller 1
0020-003F	Interrupt controller 1
0040-0047	System timer
0050-0057	System timer
0060-006F	System controller 8742
0070	CMOS RAM address and NMI mask
0078-007B	Real-time clock
0080-009F	DMA page register
00A0-00BF	Interrupt controller 2
00C0-00DF	DMA controller 2
00F0	Clear math coprocessor
00F1	Reset math coprocessor
0F8-0FF	Math coprocessor
1F0-1F7	Primary IDE channel
170-177	Secondary IDE channel
0278-027F	Parallel port 2

**Table 6: System input/output addresses (Continued)**

<b>Address range (hexadecimal)</b>	<b>Function</b>
02F8-02FF	Serial port
0378-037F	Parallel port 1
03F0-03F5	Diskette drive controller
03F8-03FF	Modem
0CF8-0CFB	PCI mechanism #1 configuration address register
(0CF8)	PCI mechanism #2 configuration space enabled register
(0CFA)	PCI mechanism #2 forward register
C000-C0FF	M1451C PCI configuration space
C200-C2FF	M1449 PCI configuration space
C100-C1FF	PCI configuration space
C300-CFFF	PCI configuration space

# System interrupts

This table shows the system Interrupt Requests (IRQs) and their functions. You may use this information if you install an adapter card that requires you to set IRQs. An IRQ function which has a device name in parenthesis may not be available on all models. In some cases, the device listed uses the IRQ.

**Table 7: System interrupts**

<b>Interrupt request (IRQ)</b>	<b>Function</b>
0	Timer
1	Keyboard
2	Cascade interrupt control
3	Serial port
4	Modem
5	Available (Sound)
6	Diskette
7	Parallel port
8	Real-time clock
9	Video
10	Available (USB)
11	Available (Sound)
12	PS/2 mouse
13	Math coprocessor
14	Primary IDE
15	Secondary IDE

# DMA channel assignments

This table shows the channel assignments for Direct Memory Access (DMA). DMA allows I/O devices to transfer data directly to and from memory. You may need to select an available DMA channel if you add an I/O device that uses DMA.

**Table 8: DMA channel assignments**

<b>DMA channel</b>	<b>Assignment</b>
0	Available
1	Available (Sound)
2	Diskette
3	Available (Sound)
4	Cascade
5	Available (voice modem)
6	Available (voice modem)
7	Available

# Serial port addresses

IBM Aptiva PCs have a built-in external serial port already installed in the computer. The connector for this port is located at the back of your computer. This port can be used to connect a serial mouse, serial printer, or other serial device and to transfer data between computers.

The built-in serial port supports the following addresses and interrupts.

**Table 9: Serial port addresses**

<b>Address</b>	<b>COM#</b>	<b>Interrupt</b>	<b>Default</b>
3F8	COM1	IRQ 4	Modem
2F8	COM2	IRQ 3	Serial port
3E8	COM3	IRQ 4	
2E8	COM4	IRQ 3	

Conflicts may arise if you add adapter cards with serial ports or if you change the address settings on your modem if you are using an operating system other than Windows 95. You can resolve most of these conflicts by using Setup or the Windows 95 Device Manager to change serial port addresses. See “Devices and I/O Ports” on page 5-9 or “Resolving resource conflicts” on page 6-3 for more information.

## Modem features

Using a telephone network, a modem allows your computer to communicate with other computers, fax machines, or telephones. For information about connecting your modem to a telephone network, see “Connecting your modem to the telephone network” on page 3-9.

**Caution:**

*Before you plug your modem into a telecommunications system outside the country in which it was purchased, make sure your modem is designed to work with that telecommunications system. Otherwise, you could damage your computer. Read the guidelines in “Safety information” on page xi before you plug your modem into any telecommunications system.*

Some IBM Aptiva PCs have a modem already installed. If your computer came with a modem, all you have to do is connect the modem to a telephone line. (You may also connect a telephone to the modem if it has two RJ11C jacks). The system firmware is already configured to load the modem drivers and software once you have made the connections.

If your computer does not have a modem but you intend to install one, see the documentation that came with the modem for installation instructions and reference information.

If present, the modem that came with your computer is a K56flex bps modem. It serves as a communications peripheral capable of high-speed data transfer, fax, and in some models, speakerphone, and Digital Simultaneous Voice and Data (DSVD). Your modem is compatible with the following standards:

- K56flex (up to 56K bps down stream only)
- V.70 (DSVD system)
- V.34 (33600 bps)
- V.32bis (14400 bps)
- V.32 (9600 bps)
- V.22bis (2400 bps)
- V.22 (1200 bps)
- Bell 212A (1200 bps)
- V.23 (1200/75 bps)
- V.21 (300 bps)
- Bell 103 (300 bps)
- V.17 (14400 bps FAX)
- V.29 (9600 bps FAX)
- V.27ter (4800 bps FAX)
- V.21 channel-2 (300 bps FAX)
- TIA/EIA 578 Class 1 fax command set
- IS-101 voice command set
- V.42bis (data compression)

- V.42 (error correction)
- MNP5 (data compression)
- TIA/EIA 602 AT command set
- V.8 start-up sequence
- Plug and Play ISA specifications
- V.80 (Video Ready Mode)
- MNP2-4 error correction
- PC 97 logo

# Operating your modem

You can perform common modem functions such as dialing, file transfer, and faxing using the modem communications software that came with your computer. For information about configuring communications software, see “Configuring your communications software” on page 3-10.

**Note:**

*The communications software that came with your Aptiva computer provides a friendly interface for all common modem functions and should be sufficient for all of your communication needs.*

It is still possible for you to perform the basic modem functions using the AT commands from the Windows 95 DOS box prompt. A list and description of all the AT commands appear in the section “AT commands” on page B-6.

We strongly recommend, however, that you perform all modem operations through the modem communications software since it is designed to eliminate the inconvenience of using the AT commands. Modem software allows you to operate the modem by simply selecting command items from onscreen menus.

**Note:**

*Most modem communications software programs also allow you to send specific AT commands to the modem.*



## Using the Auto Answer feature

If you use a modem communications software program, it may require your modem to be set for *Auto Answer*. The Auto Answer feature lets your computer answer calls from another computer automatically.

Your modem communications software determines how the modem operates with Auto Answer. Some fax programs do not require you to type an AT command to turn Auto Answer on or off. For specific instructions, see the user's guide that came with the communications software.

To start the Auto Answer feature from your communications software, use the command: **ATSO=n**. This command tells the modem to answer a call after a certain number of rings. To set the number of rings, replace **n** with any number from 1 to 255.

If you do not have a voice modem, turn Auto Answer off when you are not using your modem. Otherwise, callers will be greeted with the modem tone. To turn Auto Answer off, use the command: **ATSO=0**.

In some communications software programs, you may need to select the "Auto Answer On" or "Auto Answer Off" option to turn off the auto answer feature.

**Note:**

*If you are using Auto Answer with a fax software program, setting a high number of rings will allow you to answer the telephone before the fax modem does.*

If your computer came with fax software already installed, use the fax software documentation included in the box your computer came in or the fax software online Help for additional information.

## Disabling Call Waiting

If you use the Call Waiting feature on your telephone, you may want to disable it while using your modem. With Call Waiting, communications can be interrupted when a second call is waiting to be answered.

To disable Call Waiting, contact your telephone company. Different telephone companies have different procedures for disabling this feature. Also, some telephone companies cannot disable Call Waiting. Your telephone company business office should be able to tell you the procedures and *dialing sequence* required to disable Call Waiting.

A dialing sequence is similar to a command you type on your computer. For example, in some areas the following dialing sequence disables Call Waiting:

**(# or \*)70,,,(complete telephone number)**

The dialing sequence you type on your computer may look like this: **\*70,,,5554343**. The commas (,,) pause the modem until the command is carried out, then the telephone number is dialed automatically.

Call Waiting will be disabled **only** for the duration of your modem's current call and only from the calling end. For incoming calls, you may find it helpful to change the value of register S10 to a higher number. For more information on S registers, see "S registers" on page B-14.

Your modem communications software determines how your modem operates with Call Waiting. For specific instructions, see the user's guide or online Help that came with the communications software.

If your computer came with a fax software already installed, use the fax software documentation included in your computer package or the fax software online help for additional information.

## Communication settings

For IBM Aptiva PCs that came with modems installed, the modems are preset to **COM1 assigned with the address 3F8 and IRQ4**. The modem address in your communications software must match the address setting of your modem.

The addresses and interrupts supported by your computer are:

<b>COM #</b>	<b>Address</b>	<b>Interrupt</b>
COM1	3F8	IRQ 4
COM2	2F8	IRQ 3
COM3	3E8	IRQ 4
COM4	2E8	IRQ 3

## Changing modem addresses

There are times when you may need to change the default address of your modem. You may use the Windows 95 Device Manager to do this. See the section "Resolving resource conflicts" on page 6-3. This section contains information to help you avoid potential conflicts when you need to change resources used by adapter cards.

# Modem commands

This section provide information on the modem commands should you need to operate your modem from the DOS prompt using the AT command strings.

## Executing commands

Your modem is in the Command Mode upon power-on and is ready to receive and execute AT commands. The modem remains in the Command Mode until it makes a connection with a remote modem. Commands may be sent to the modem from an attached terminal or a PC running a communication program.

The modem is designed to operate at common DTE speeds ranging from 115.2K bps (or 57.6K bps) to 300K bps. All commands and data must be issued to the modem using one of the valid DTE speeds.

## Command format

All commands must begin with the **AT** prefix, followed by the command letter and ended with the **Enter** key. Spaces are allowed in the command string to increase command readability but are ignored by the modem during command execution. All commands may be typed in either upper or lower case, but not mixed. A command issued without any parameters is considered as specifying the same command with a parameter "0".

Example:

**ATL [ Enter ]**

This command causes your modem to lower its speaker volume.

# AT commands

**Table 10: AT commands**

<b>Command</b>	<b>Function</b>
<b>A</b>	Answers incoming call
<b>A/</b>	Repeats the last command given. Note: Do not precede by AT or follow by Enter
<b>B0</b>	ITU/CCITT mode @ 1200 bps
<b>B1</b>	Bell mode @ 1200 bps
<b>B15</b>	ITU/CCITT mode @ 300 bps
<b>B16</b>	Bell mode @ 300 bps
<b>D</b>	0-9, A-D, # and * L = last number redial P = pulse dial T = tone dial W = wait for second dial tone V = switch to speakerphone mode , = pause @ = wait for five seconds of silence ! = flash ;= return to command mode after dialing
<b>DS=n</b>	Dials one of four stored telephone numbers (n=0-3) in the modem's nonvolatile memory
<b>E0</b>	Commands echo disabled
<b>E1</b>	Commands echo enabled
<b>+++</b>	Escape characters - switch from data mode to command mode

**Table 10: AT commands (Continued)**

<b>Command</b>	<b>Function</b>
<b>H0</b>	Modem on-hook (hang-up)
<b>H1</b>	Modem off-hook (make busy)
<b>I0</b>	Firmware and device ID
<b>I1</b>	Checksum code
<b>I2</b>	ROM test
<b>I3</b>	Firmware and device ID
<b>L0</b>	Low speaker volume
<b>L1</b>	Low speaker volume
<b>L2</b>	Medium speaker volume
<b>L3</b>	High speaker volume
<b>M0</b>	Speaker always off
<b>M1</b>	Speaker on until carrier detected
<b>M2</b>	Speaker always on
<b>N0</b>	Automode disabled, modem handshake speed specified by S37
<b>N1</b>	Automode enabled, modem handshake speed specified by S37
<b>O0</b>	Return to data mode
<b>O1</b>	Initiate an equalizer retrain and return to data mode
<b>P</b>	Pulse dial
<b>Q0</b>	Result codes enabled
<b>Q1</b>	Result codes disabled

**Table 10: AT commands (Continued)**

<b>Command</b>	<b>Function</b>
<b>Sr?</b>	Read S register r, where r=0-95
<b>Sr=n</b>	Set S register r to value n (r=0-95; n=0-255)
<b>T</b>	Tone dial
<b>V0</b>	Numeric responses
<b>V1</b>	Text responses
<b>X0</b>	Hayes Smartmodem 300 compatible responses/blind dialing
<b>X1</b>	Same as X0 plus all CONNECT responses/blind dialing
<b>X2</b>	Same as X1 plus dial tone detection
<b>X3</b>	Same as X1 plus busy signal detection/blind dialing
<b>X4</b>	All responses and dial tone and busy signal detection
<b>Z</b>	Reset and recall user profile

# Extended AT commands

**Table 11: Extended AT commands**

<b>Command</b>	<b>Function</b>
<b>&amp;C0</b>	Carrier Detect (CD) always on
<b>&amp;C1</b>	Turn on CD when remote carrier is present
<b>&amp;D0</b>	DTR signal ignored
<b>&amp;D1</b>	Modem returns to Command Mode after DTR toggle
<b>&amp;D2</b>	Modem hangs up and returns to the command mode after DTR toggle
<b>&amp;D3</b>	Modem resets after DTR toggle
<b>&amp;F</b>	Load factory default configuration
<b>&amp;G0</b>	Guard tone disabled
<b>&amp;G1</b>	550 Hz guard tone enabled
<b>&amp;G2</b>	1800 Hz guard tone enabled
<b>&amp;M0</b>	Asynchronous operation
<b>&amp;S0</b>	DSR always on
<b>&amp;S1</b>	DSR is off in command mode, on in online mode
<b>&amp;T0</b>	Terminate test in progress
<b>&amp;T1</b>	Run local analog loopback
<b>&amp;T6</b>	Run remote digital loopback test
<b>&amp;V</b>	View active profiles

# V.42bis commands

**Table 12: V.42bis commands**

<b>Command</b>	<b>Function</b>
<b>&amp;K0</b>	Disable flow control
<b>&amp;K3</b>	Enable RTS/CTS hardware flow control (data mode default)
<b>&amp;K4</b>	Enable XON/OFF software flow control
<b>&amp;Q0</b>	Normal mode data link only (same as \N3)
<b>&amp;Q5</b>	V.42 data link with fallback options
<b>&amp;Q6</b>	Normal mode (speed buffering) data link only (same as \N0)
<b>%C0</b>	Data compression disable
<b>%C1</b>	V.42bis/MNP5 data compression enabled
<b>\N0</b>	Normal mode (speed buffering) only
<b>\N1</b>	Direct mode only
<b>\N2</b>	MNP mode only
<b>\N3</b>	V.42/MNP/Normal auto-mode
<b>\N4</b>	V.42 mode only
<b>\Q0</b>	Disable flow control (same as &K0)
<b>\Q1</b>	Enable XON/XOFF flow control (same as &K4)
<b>\Q3</b>	Enable CTS/RTS flow control (same as &K3)
<b>\V0</b>	Disable protocol result code appended to DCE speed
<b>\V1</b>	Enable protocol result code appended to DCE speed



# Modem response codes

The following table lists the basic codes that the modem sends to your computer in response to the commands you type. They are called response codes.

**Table 13: Basic Response codes**

<b>Digit code</b>	<b>Word code</b>	<b>Meaning</b>
<b>0</b>	OK	Command was carried out without error
<b>1</b>	Connect	Connected at 300 bits per second (bps)
<b>2</b>	Ring	Ringing signal detected
<b>3</b>	No carrier	Carrier is lost or not heard
<b>4</b>	Error	Error in the command line Invalid command Command line exceeds buffer Invalid character format
<b>5</b>	Connect 1200EC <sup>a</sup>	Connected at 1200 bps
<b>6</b>	No dial tone	No dial tone during the time-out period
<b>7</b>	Busy	The line being called is busy
<b>8</b>	No answer	The line being called did not answer within the time-out period
<b>10</b>	Connect 2400EC*	Connected at 2400 bps
<b>11</b>	Connect 4800EC*	Connected at 4800 bps
<b>12</b>	Connect 9600EC*	Connected at 9600 bps
<b>13</b>	Connect 14400EC*	Connected at 14400 bps
<b>14</b>	Connect19200EC*	Connected at 19200 bps

**Table 13: Basic Response codes (Continued)**

<b>Digit code</b>	<b>Word code</b>	<b>Meaning</b>
<b>18</b>	Connect 57600EC*	Connected at 57600 bps
<b>24</b>	Connect 7200EC*	Connected at 7200 bps
<b>25</b>	Connect 12000EC*	Connected at 12000 bps
<b>28</b>	Connect 38400EC*	Connected at 38400 bps
<b>40</b>	Connect 300EC*	Connected at 300 bps
<b>55</b>	Connect 21600EC*	Connected at 21600 bps
<b>56</b>	Connect 24000EC*	Connected at 24000 bps
<b>57</b>	Connect 26400EC*	Connected at 26400 bps
<b>58</b>	Connect 28800EC*	Connected at 28800 bps
<b>59</b>	Connect 31200EC*	Connected at 31200 bps
<b>60</b>	Connect 33600EC*	Connected at 33600 bps
<b>70</b>	Connect 32000 EC*	Connected at 32000 EC bits / s, 56K rate
<b>71</b>	Connect 34000 EC*	Connected at 34000 EC bits / s, 56K rate
<b>72</b>	Connect 36000 EC*	Connected at 36000 EC bits / s, 56K rate
<b>73</b>	Connect 38000 EC*	Connected at 38000 EC bits / s, 56K rate
<b>74</b>	Connect 40000EC*	Connected at 40000 EC bits / s, 56K rate
<b>75</b>	Connect 42000 EC*	Connected at 42000 EC bits / s, 56K rate
<b>76</b>	Connect 44000 EC*	Connected at 44000 EC bits / s, 56K rate
<b>77</b>	Connect 46000 EC*	Connected at 46000 EC bits / s, 56K rate
<b>78</b>	Connect 48000 EC*	Connected at 48000 EC bits / s, 56K rate
<b>79</b>	Connect 50000 EC*	Connected at 50000 EC bits / s, 56K rate

**Table 13: Basic Response codes (Continued)**

<b>Digit code</b>	<b>Word code</b>	<b>Meaning</b>
<b>80</b>	Connect 52000 EC*	Connected at 52000 EC bits / s, 56K rate
<b>81</b>	Connect 54000 EC*	Connected at 54000 EC bits / s, 56K rate
<b>82</b>	Connect 56000 EC*	Connected at 56000 EC bits / s, 56K rate
<b>86</b>	Connect 16800EC*	Connected at 16800 bps
<b>87</b>	Connect 115200EC*	Connected at 115200 bps
<b>88</b>	Delayed	
<b>89</b>	Blacklisted	
<b>90</b>	Blacklist full	

a. EC appears only when the Extended Result Codes configuration option (AT\V1) is enabled. EC is replaced by one of the following symbols, depending on the error control method used:

V.42bis - V.42 error control V.42bis data compression

V.42 - V.42 error control only

MNP 5 - MNP class 4 error control and MNP class 5 data compression

MNP 4 - MNP class 4 error control only

NoEC - No error control protocol

# S registers

S registers are information storage areas inside the modem. The AT command set uses the S registers to configure modem options. Some S registers have default settings. For normal modem operations, the default settings are usually adequate. However, special circumstances may require you to change some defaults. To change or read the value of an S register, begin the command with the letters **AT**.

## To read the value of an S register:

- Use the **ATSR?** command (*r*=register number 0-28).

For example, to read the value of S register 0, type **ATS0?** and press **Enter**.

## To change the value of an S register:

- Use the **ATSR=n** command (*r*=register number 0-28, *n*=the new value you want to assign).

For example, to change the value of S register 0 to 20 rings, type **ATS0=20** and press **Enter**.

The following table lists the S Registers summary.

**Table 14: S registers**

Register	Function	Range/units	Default
<b>S0</b>	Auto-answer ring	0-255 /rings	0
<b>S1</b>	Ring counter	0-255 /rings	0
<b>S2</b>	Escape code character	0-127 /ASCII	43
<b>S3</b>	Carriage return character	0-127 /ASCII	13
<b>S4</b>	Line feed character	0-127 /ASCII	10
<b>S5</b>	Backspace character	0-127 /ASCII	8
<b>S6</b>	Dial tone wait time	2-65 /seconds	2

**Table 14: S registers (Continued)**

<b>Register</b>	<b>Function</b>	<b>Range/units</b>	<b>Default</b>
<b>S7</b>	Remote carrier wait time	1-255 /seconds	50
<b>S8</b>	Comma pause time	0-65 /seconds	2
<b>S10</b>	Carrier loss time	1-254 /10ths of a second	20
<b>S11</b>	Touch-tone dialing speed	50-150 /milliseconds	95
<b>S12</b>	Escape character detect time	0-255 /50ths of a second	50
<b>S28</b>	V.34 modulation enable/disable	0-255 /ASCII	1
<b>S35</b>	Data calling tone	0-1 /ASCII	0
<b>S37</b>	Connection speed	Bitmapped register	0
<b>S38</b>	K56flex connection speed	0-16	1
<b>S89</b>	Sleep mode timer	0, 5-255	10



# Monitor terminology

## Appendix C

As you read the documentation that came with your monitor and the monitor information provided in this chapter, you might find a few technical terms. If you change your monitor settings, refer to the following table to understand some of the terms used to describe monitor characteristics.

**Table 15: Monitor terms and definitions**

<b>Term</b>	<b>Definition</b>
<b>display mode</b>	A resolution setting associated with a vertical frequency setting (and sometimes a color setting). For example, 640x480 at 75 Hz, 256 colors.
<b>horizontal frequency</b>	Rate (in kilohertz [kHz]) at which each line on the screen is drawn.
<b>interlaced</b>	Method of producing an image by drawing only alternating lines until the entire image is completed.
<b>noninterlaced</b>	Method of producing an image by drawing each line, one after the other, until the entire image is completed. This method produces less flicker than the interlaced method.
<b>pel (or pixel)</b>	A picture element. A small rectangle or portion of an image that together with other pels make up the entire image.
<b>resolution</b>	The number of pels required to display an image horizontally and vertically. For example, 640x480 means 640 pels horizontally and 480 pels vertically.
<b>SVGA</b>	Super video graphics array. A video standard that provides some of the higher text and graphics resolutions.
<b>vertical frequency/ refresh rate</b>	Rate (in hertz [Hz]) at which the entire image is drawn on the screen. Also called “refresh rate.”





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